

MODULAR OPEN
SYSTEMS APPROACH

A MOSA APPROACH FOR GROUND VEHICLE SYSTEM ENTERPRISE COMMONALITY

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GVSETS

GROUND VEHICLE SYSTEMS ENGINEERING & TECHNOLOGY SYMPOSIUM & MODERNIZATION UPDATE

NDIA
Michigan

Future Battlespace & MOSA

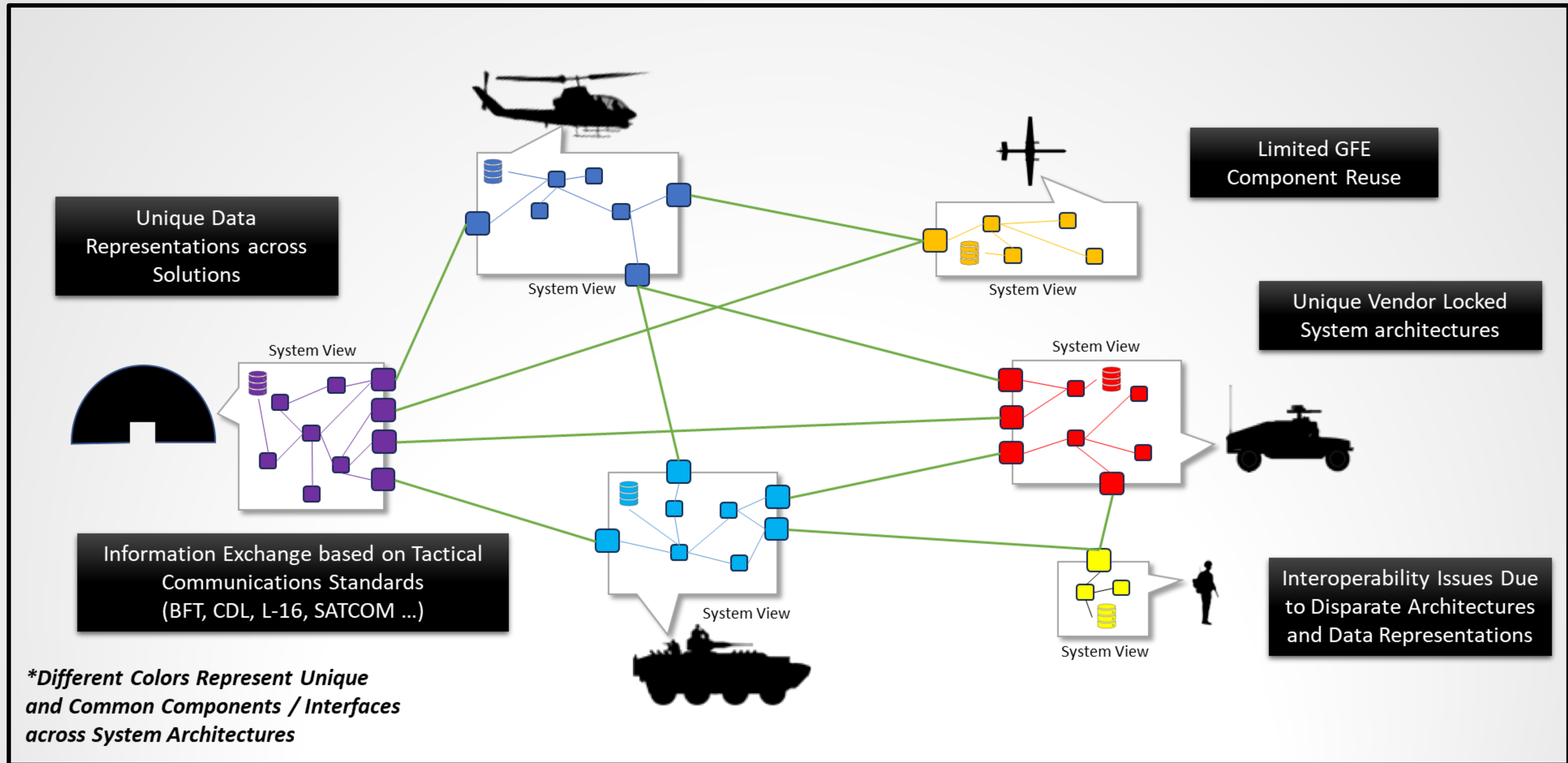
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- Future battlespace is complex and involves multiple levels of threats across multiple operational domains.
- The multi-domain operations (MDO) environment requires a force that can interoperate across systems in different domains to work seamlessly to achieve the operational objectives.
- The Modular Open Systems Approach (MOSA) provides the foundation for new and enduring systems to provide key quality attributes such as modifiability, adaptability, interoperability, etc.
- Existing commonality of communications standards combined with common data representation within the systems can provide the basis of interoperability within the MDO.
- MOSA has the potential to drive reuse across systems if the implementation architecture approach is founded in product line engineering (PLE) principles.



Current Stovepipe Solutions

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Ground Combat Systems MOSA and Interoperability

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- Future ground formations will interoperate across domains and services
 - manned vehicles
 - unmanned/robotic vehicles
 - launched effects
 - unmanned air vehicles.
- Current ground combat systems (GCS) uniqueness limits MOSA characteristics
 - Unique architectures
 - Unique communications
 - Unique data representations



Ground Combat Systems MOSA and Interoperability

- Individual systems struggle to achieve MOSA objectives within the MDO due to their stovepipe nature
 - Common datalinks enable system interoperability, but...
 - Also need system-internal modularity and commonality
- Future GCS solutions need common capabilities to meet MOSA and Interoperability objectives in MDO
 - Digital Backbone
 - Enterprise Key Interfaces
 - Enterprise Data Model
 - Transport Services
 - Common Components

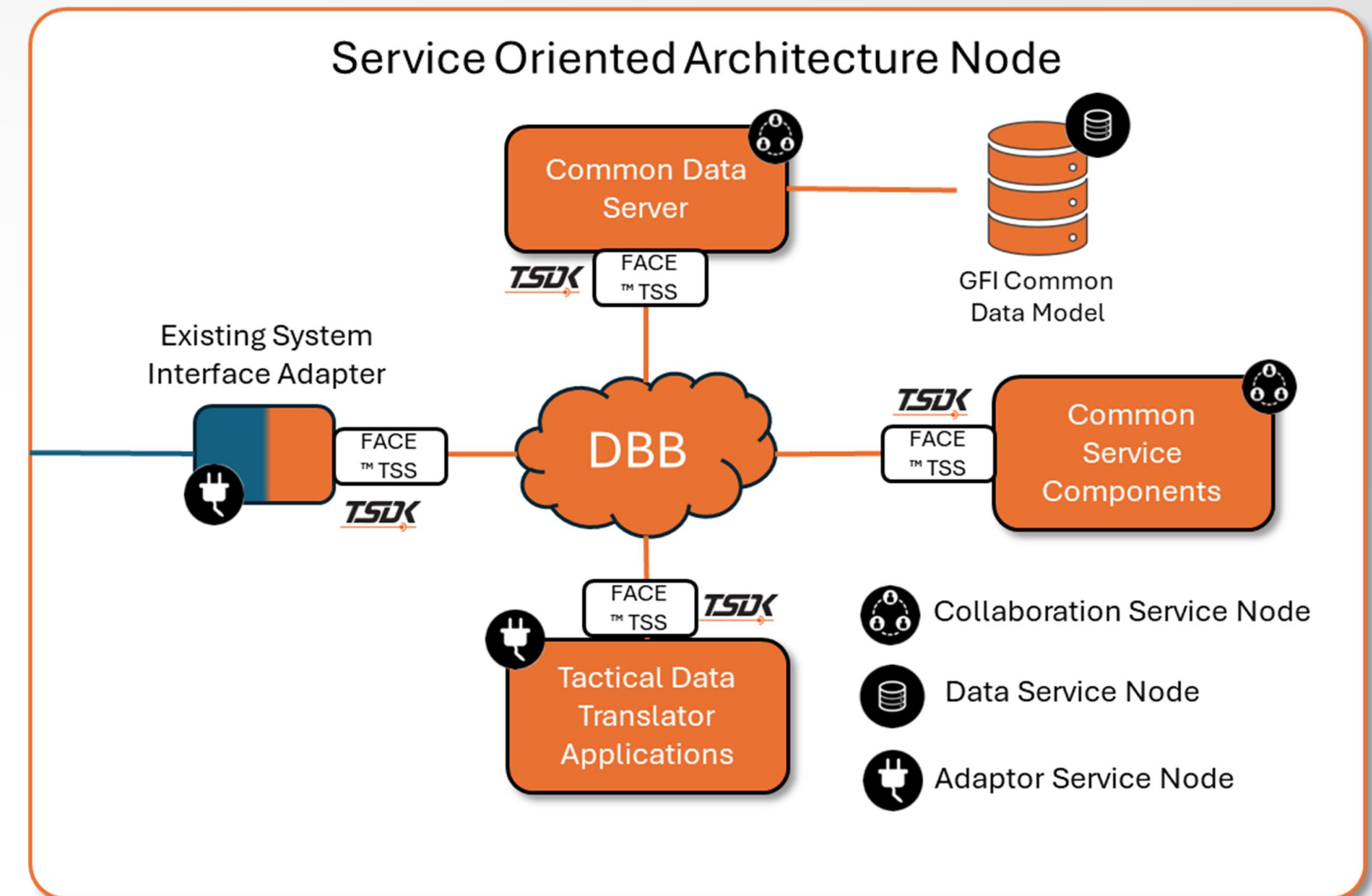


SOA Solution for MOSA and Interoperability

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- Common Components and Services
- Enterprise Key Interfaces
- Enterprise Data Model
- Transport Services
- Digital Backbone

Service Oriented Architecture (SOA)



SOA NODE



Elements of the SOA Solution

- **Service Oriented Architecture (SOA)** - The use of Service Oriented Architecture (SOA) simplifies the reuse of components across different enterprise systems in support of interoperability
- **Common Components and Services** - Implementation of SOA across the enterprise and within the weapon systems is achieved by a set of common components and services implemented as reusable components.
- **Enterprise Data Model** - An Enterprise Data Model, realized as Domain Specific Data Models (DSDM) for the Enterprise using common conceptual and logical definitions ensures that system components will have compatible data representations.



Elements of the SOA Solution

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- **Digital Backbone** - The Digital Backbone provides a high speed and low latency data distribution and interconnect for components within the weapon system.
- **Enterprise Key Interfaces** - Key Interfaces help to drive commonality within, and between enterprise weapon systems using commercial and DoD standards.
- **Transport Services** - The use of Transport Services, such as FACE™, abstracts components from underlying communications, configuration, storage, and frameworks.
- **SOA Node** – SOA node represents the implementation of the common components and services within a system using a common data model, key interfaces over a digital backbone to support MOSA and Interoperability



Common Services

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**System
Information
Services**

**Mission
Management
Services**

**Data
Infrastructure
Services**

**Cyber Security
Services**

**Mission Data
Services**



Common Components

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**Tactical
Communications
Adapters**

**Common Data
Server
Applications**

**Advanced
Teaming and
Management**

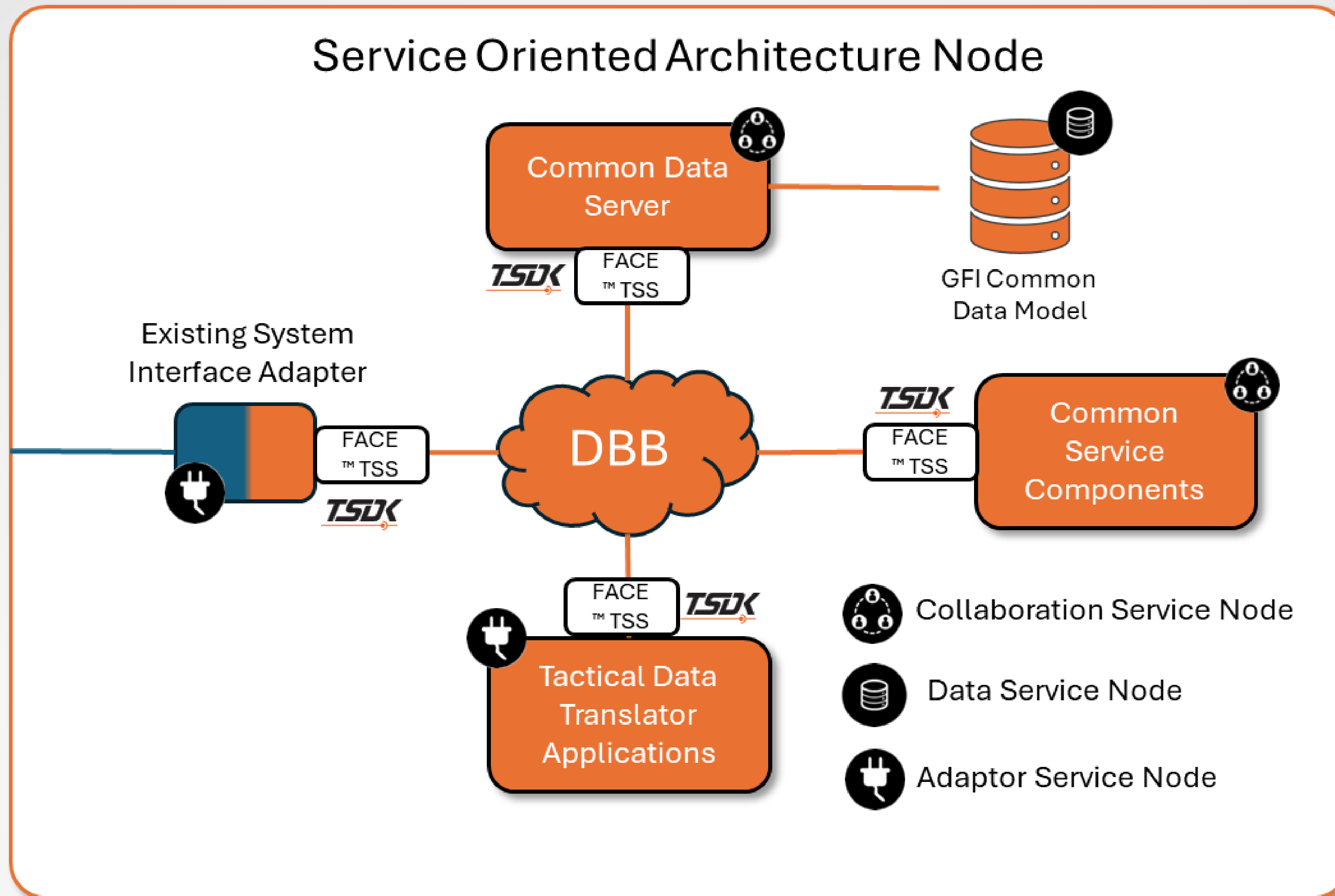
**Sensor and
Effector
Adapters**

**Common Data
Translators**

**Data Transport
Solutions**

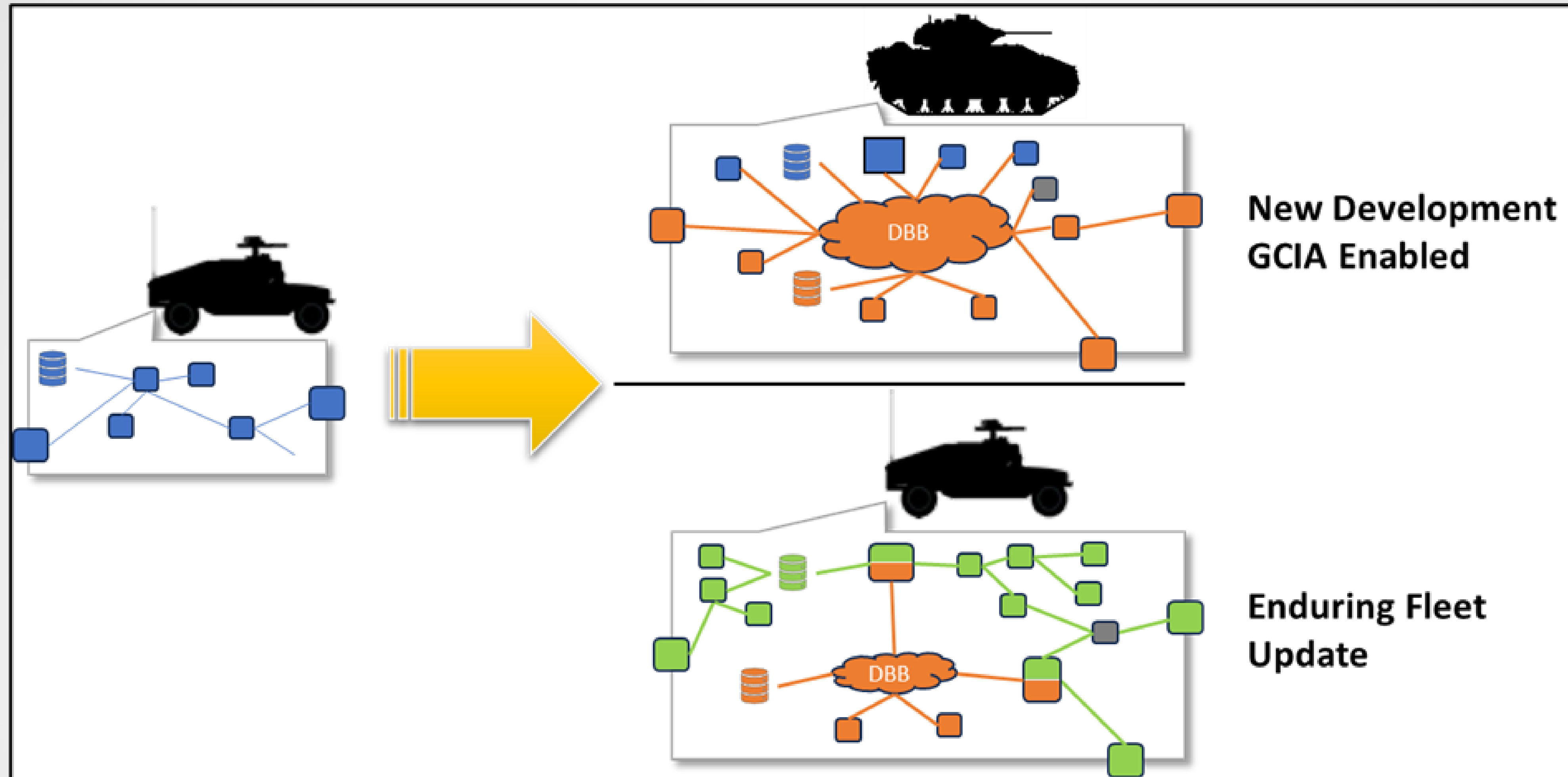


SOA Node Example



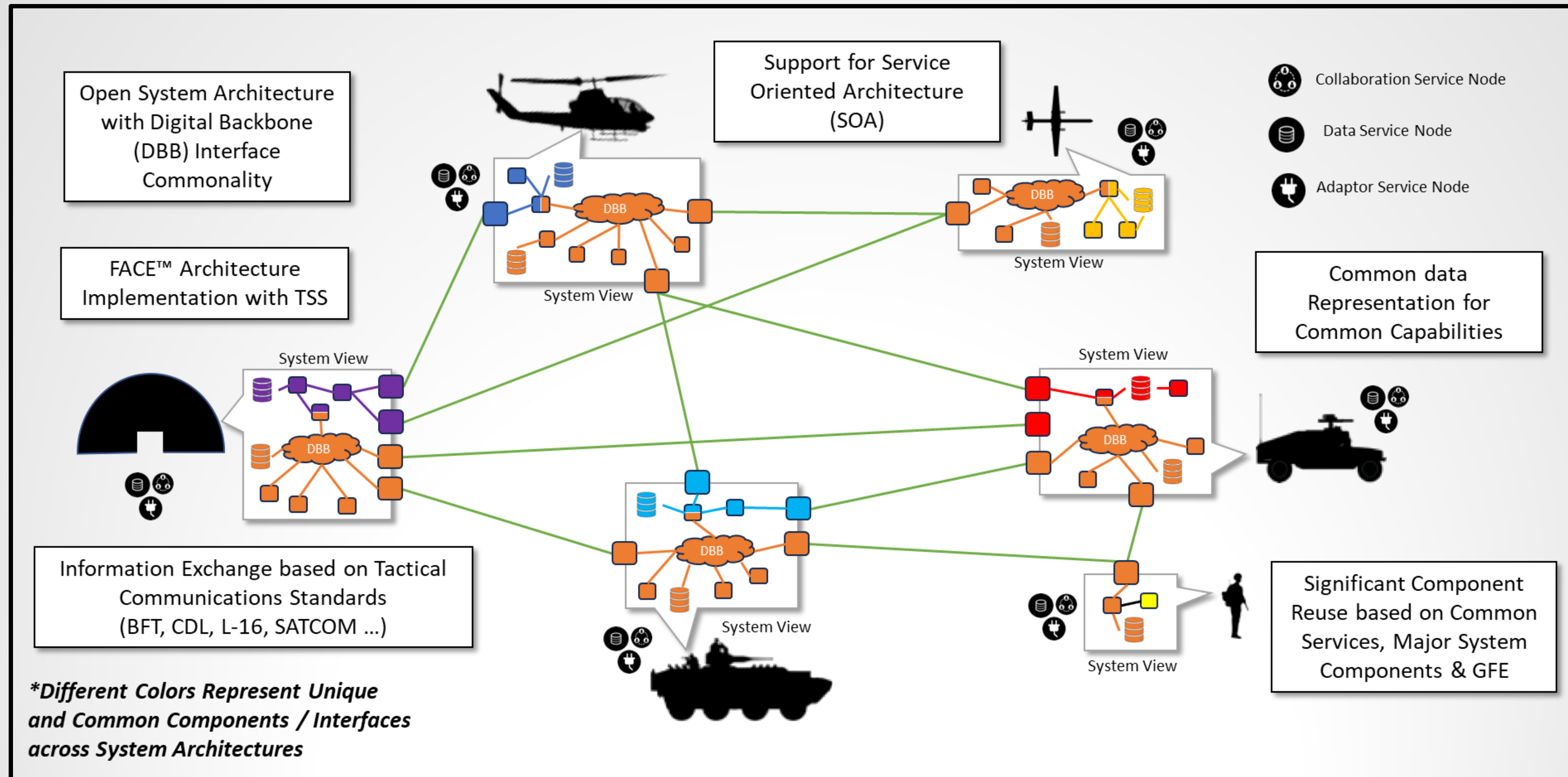
GCS Transition to SOA

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Future Distributed SOA Example

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QUESTIONS



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