

Net-Centric Adapter for Legacy Systems (NCALS):

*Affordable Net-Enabling of Joint Service
Combat and Weapon Systems*



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The Bottom Line Up Front



Net-Centric Adapter for Legacy Systems
(NCALS) is

a ***configurable*** software technology

that ***automatically***

**exposes legacy system data and services to
the Global Information Grid (GIG) and
obtains GIG data and services in near real-time**

- *Prototyped and demonstrated*
- *Planned beta version release: FY10*

- **National Defense Strategy:**
 - *“We will conduct network-centric operations...”*
- **National Military Strategy:**
 - *“...a collaborative information environment that facilitates information sharing, effective synergistic planning, and execution of simultaneous, overlapping operations...”*
- **ASD(NII) / DoD CIO:**
 - *Access to information* – *Sharing of information*
 - *Support of collaboration*

- **Requires compliance with net-centric (enterprise) technical standards**
 - *Data formats*
 - *Software services*
 - *Software Architecture*
- **Large number of legacy systems in DoD**
 - *Not designed for net-centric standards*
 - *Significant cost, schedule and risk to comply*
 - *Legacy software constitutes a major area of risk*

Some Key Net-Centric Standards



- Hypertext Transfer Protocol (HTTP)
- eXtensible Markup Language (XML)
- eXtensible Stylesheet Language (XSL)
- Web Services Description Language (WSDL)
- Simple Object Access Protocol (SOAP)
- Transmission Control Protocol / Internet Protocol (TCP/IP)

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Legacy System Challenges



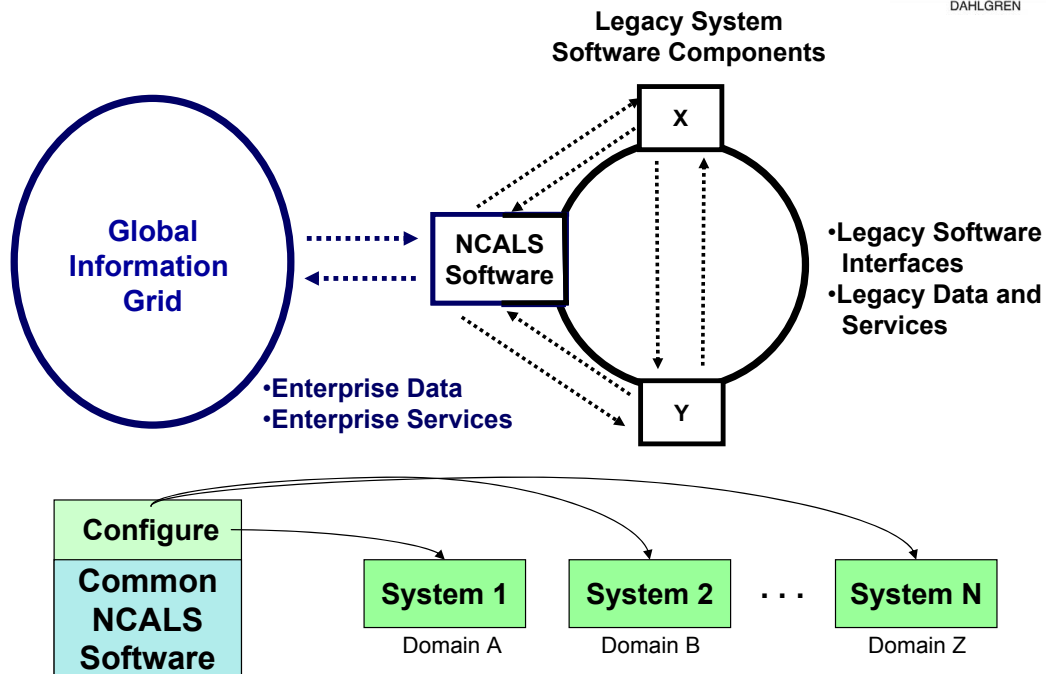
- Legacy Software Architectures
- Legacy Data Access
- Legacy Data Formats
- Legacy Point-to-Point Interfaces
- Software Architecture Constraints:
 - Mission Criticality
 - Safety
 - Real-time Processing
 - Security

Combat and Weapon Systems across the joint services have the most significant constraints

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Net-Centric Adapter Concept



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NCALS Technical Challenges



- **Transparency**
 - Minimize legacy software changes
 - Minimize legacy performance impacts
- **Performance and Scalability**
 - Provide adequate data throughput and latency
 - Providing a scalable software architecture
- **Configurability**
 - Configure a common software component for many different legacy system applications
- **Dynamic Data Association**
 - Provide the capability to dynamically “mix-n-match” data to/from multiple legacy interfaces

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NCALS Prototype Design

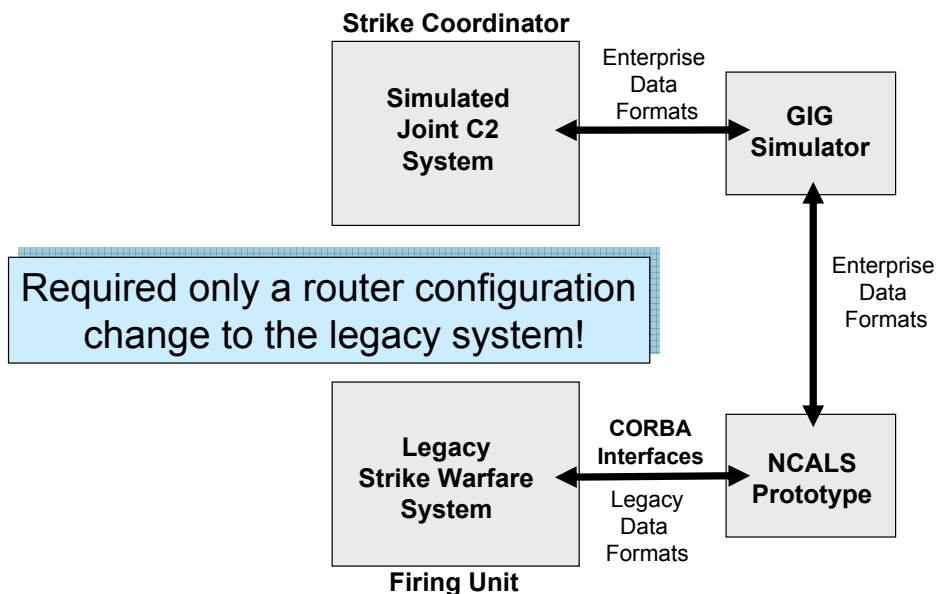


- Implemented in Java
- Supports eXtensible Markup Language (XML)
- Supports XML or customized data transforms:
 - eXtensible Stylesheet Language Transformations (XSLT)
 - Custom transforms (class-based)
- Supports variety of software interface types:
 - Web Services
 - Socket-based Application Program Interfaces (APIs)
 - Common Object Request Broker Architecture (CORBA)
 - Java Messaging Service (JMS)
 - Files (triggered on changes)
 - Custom interfaces (class-based)

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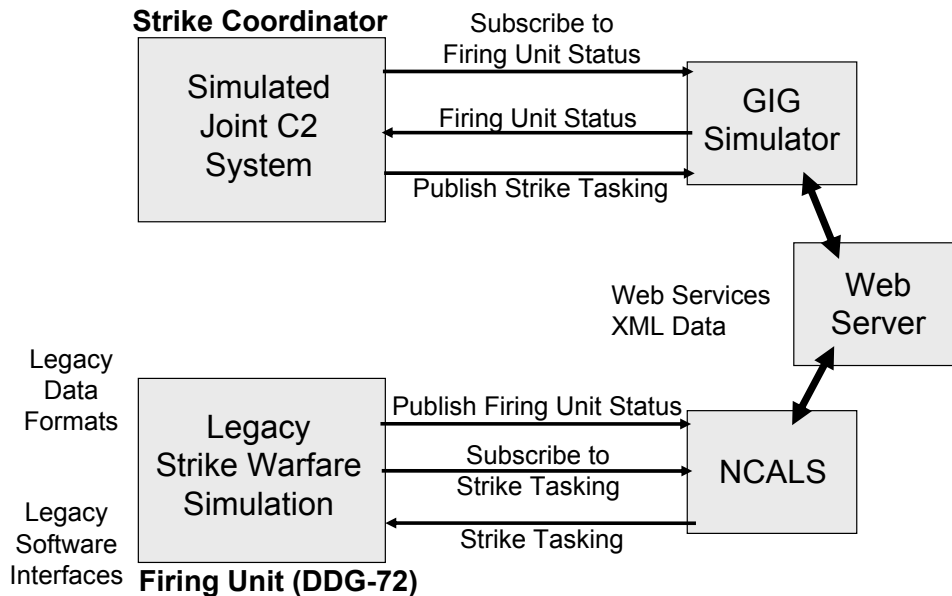
NCALS Prototype Demonstration (Navy Strike Warfare Domain)



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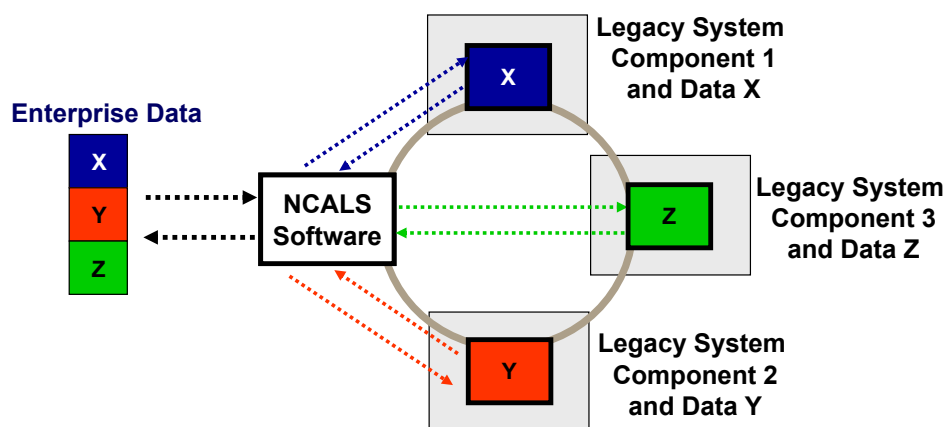
Example Demonstration Sequence (Navy Strike Warfare Domain)



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Dynamic Data Association



***Dynamically access and repackage
legacy data from multiple software interfaces***

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■ Fiscal Year (FY) 2009:

- *Enhance configuration tool*
- *Implement Dynamic Data Association capability*
- *Mature core prototype capabilities*
- *Measure prototype performance*

■ Fiscal Year (FY) 2010:

- *Release prototype Software Development Kit (SDK)*

Summary



■ NCALS . . .

- *Is a net-centric software technology for legacy systems*
- *Meets a critical need to move legacy systems into a net-centric operating environment*
- *Can be applied widely*
- *Has been prototyped and demonstrated*
- *Is being matured*
- *Will be ready for prototype applications in FY10*

Questions ?

For More Information



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(540)653-7678**

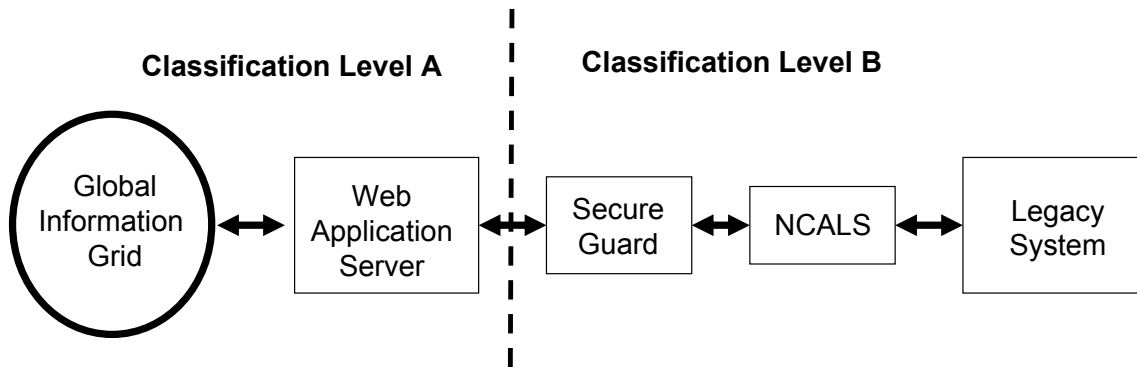
Backup Slides

Integration with Legacy Systems



- **Assumptions:**
 - Physical connectivity to GIG*
 - Compatible legacy software interfaces*
 - Data and service engineering completed*
- **Describe legacy software interfaces**
- **Describe data and service transforms required**
- **Add NCALS software to legacy network**
 - Add hardware if required*
- **Configure NCALS to provide transformations**

NCALS Coupled with Secure Guard



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Additional NCALS Applications



- **Legacy software integration**
 - Use to integrate legacy and new software components
- **Near real-time data format translation**
 - Use to translate between data formats
- **Service discovery (extension)**
 - Use to discover services on the GIG (or the network)
 - Leverage Semantic Web technologies

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