

Net-Centricity: Walking the Line Between Performance and Interoperability

(Interpretations and Implementation Architectures)

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on Interpretation



What is Net-Centricity? *

Net-Centricity: People, processes, and technology working together to enable timely and trusted: (1) Access to Information, (2) Sharing of Information, and (3) Collaboration among those who need the Information

(Asst. Secretary of Defense for Networks & Information Integration (ASD/NII) CIO Overview, 2005)

Net-Centricity: Exploitation of advancing technology to provide users the ability to access applications and services through web services. An information environment comprised of interoperable computing and communication components.

(Net-Centric Checklist 2.0, Office of Deputy Asst SECDEF for C3, Space & IT Programs, 6 Feb 04)

For the user, it means: “I can get the information I need” to enable better decisions faster and decisive actions sooner

ASD/NII CIO Overview, 2005



When I need it



Where I need it



How I need it

Adopted from The Aerospace Corporation's Course (Introduction to Net-Centricity)

Photographs reprinted courtesy of the United States Government



Common Misconceptions

- Net-centricity is all about networking.
- Web-based applications are net-centric applications.
- Net-centric = service-oriented architecture
- Net-centric principles apply only to the boundaries of systems.
- Net-centricity is a binary concept (a system is either net-centric or not)



Mission-Oriented Net-Centricity Interpretation

- Net-centricity as a spectrum rather than a single-point objective.
- Focus on the system/mission needs and capabilities.
- Interoperability as the most vital element of net-centricity.
- Service/Data Exposure depends on the mission capabilities and analysis of potential unanticipated external users.
 - Internal system architecting and degree of SOA applications.
 - Data and services to be exposed and how they are exposed.
 - The system's capabilities/needs to use dynamic/complex collaborations with GIG-provided services.
- Be ready to expose internal services with minimal effort whenever need arises.



A Brief Look at Space System Characteristics

	Space	Ground	IT
Applicable Technologies	Constrained by assurance levels	Somewhat constrained	Unconstrained
Software Footprint	Currently less than 600 KSLOC for unmanned missions	Typically less than 1.5-2M ESLOC for new programs	Typically increased emphasis on COTS integration vs. new code development
Physical Footprint	Constrained	Unconstrained	Unconstrained
connectedness	Limited ports, bandwidth	Security/information assurance constraints, Bandwidth: unconstrained	Security/information assurance constraints Bandwidth: unconstrained
Mission Service Type	Limited flexibility, Limited interaction with outside, A few complex services	Highly flexible, Multiple services, Orchestration	Highly flexible, Multiple services, Rich Interactions with others, Orchestration

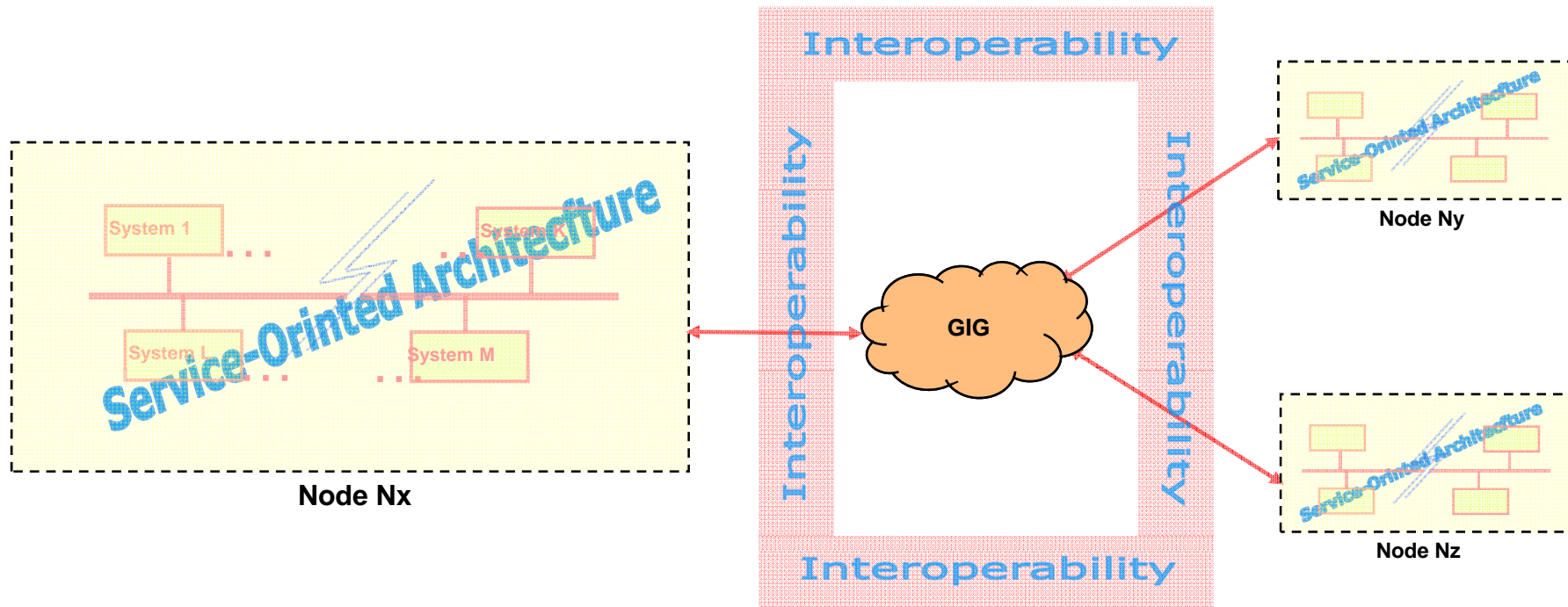
Thus net-centricity may have different implications to these systems.



on Implementation Architecture



Facilitating Net-Centric Architecture

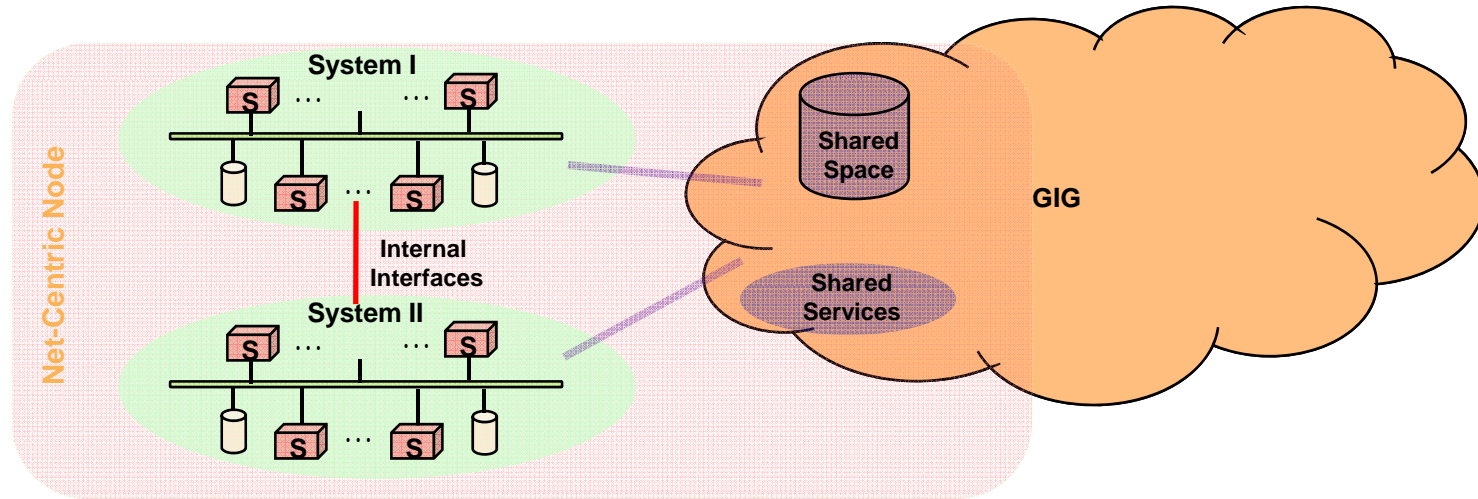


- Service-Oriented Architecture for the internal architecture of nodes.
- Interoperability among nodes (that are part of the GIG) through net-centric data and service strategies.



It is All About Defining the Boundary of a Net-centric Node

Option A



Option B

