Beyond Technical Interoperability

Context for the Net Centric Operations & Interoperability Track
@ 2011 NDIA SE Conference
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AGENDA

- Describe Interoperability and related matters
- Describe Net Enabled Operations.

Describe Interoperability and related matters

Achieving Interoperability : A perpetual motion machine

Interoperability:
" The ability of systems, units or forces to provide services to and accept services from other systems, units or forces and use the services to enable them to operate effectively together."

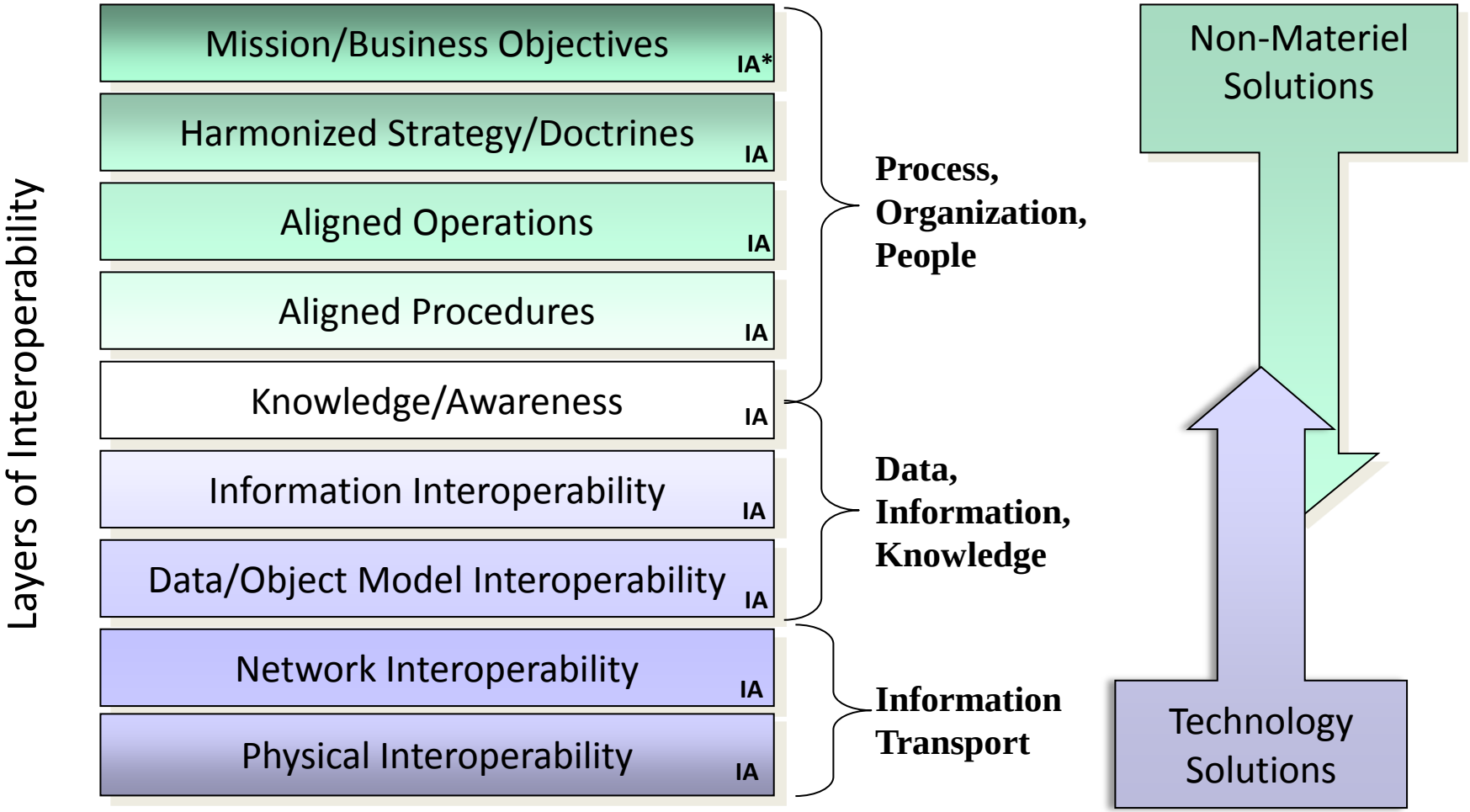
Interoperability is more than just the technical exchange of information

Solutions Sets must cover Process, Organization, People, Information, and Materiel across the range of DoD operations

Interoperability must be synergized with Information Assurance to assure obtaining the best of both.

Information Assurance:
"Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities."

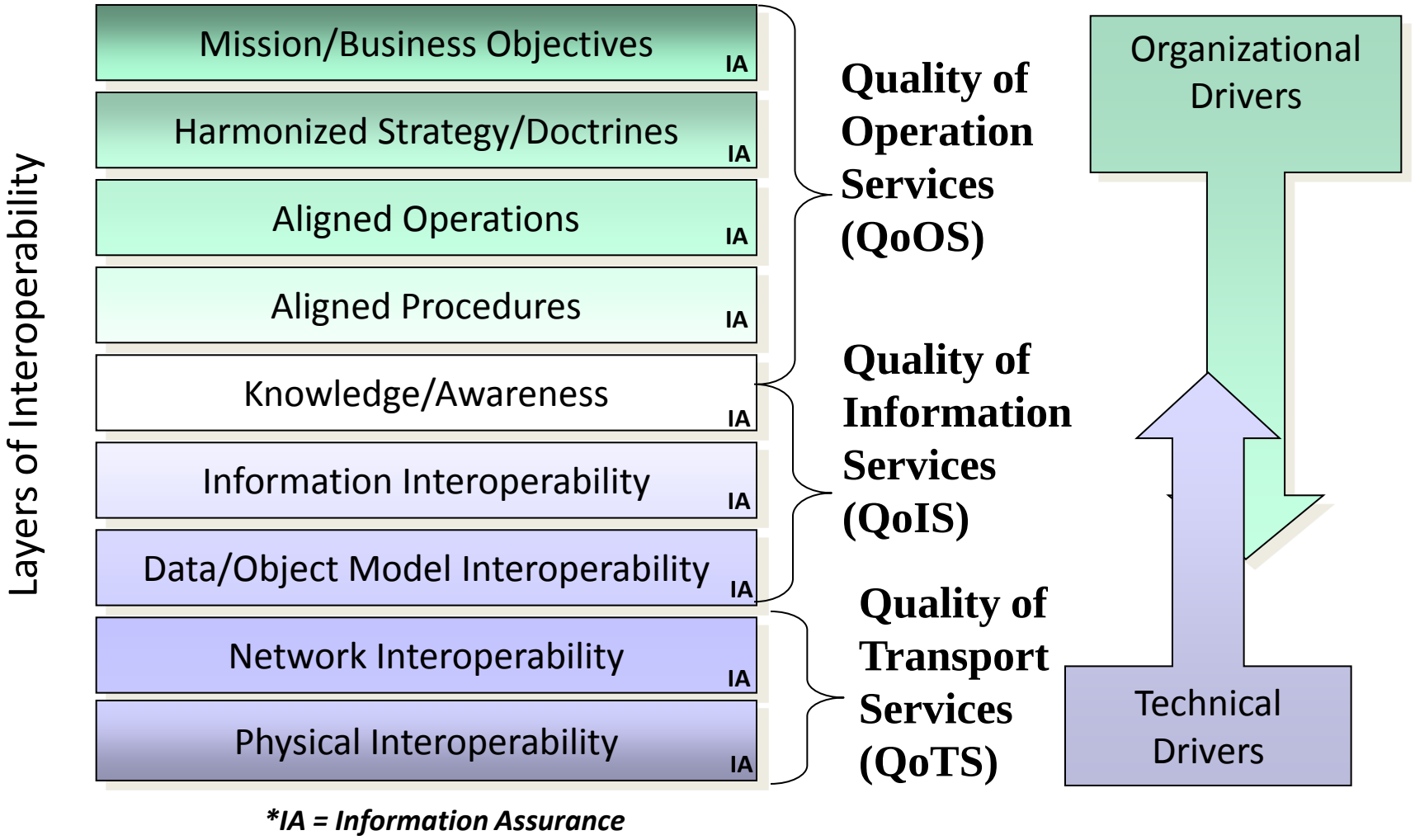
Interoperability Model:
A composite of Materiel & Non-materiel solutions



IA = Information Assurance

Adapted from "Beyond Technical Interoperability – Introducing a Reference Model for Measure of Merit for Coalition Interoperability'. Dr. Andreas Tolk, VMASC, ODU. 8th CCRTS , NDU , June 2003

Interoperability Model & QoS



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End-to-End Quality of Service

End-to-End Quality of Service =

Quality of Operation Services + **Quality of Information Services** + **Quality of Transport Services**

Key Needs:
- Mission or business objectives
- Harmonized strategy or doctrines
- Aligned operations
- Aligned procedures
  - Knowledge/awareness of actions by people and processes

Key Metrics:
- Urgency:
  - Timeliness
- Priority:
  - Degree of cooperation
- Information Assurance (IA)
  - Fluidity of response
  - Clarity of understanding
  - Ubiquity or extent of influence
  - Accuracy

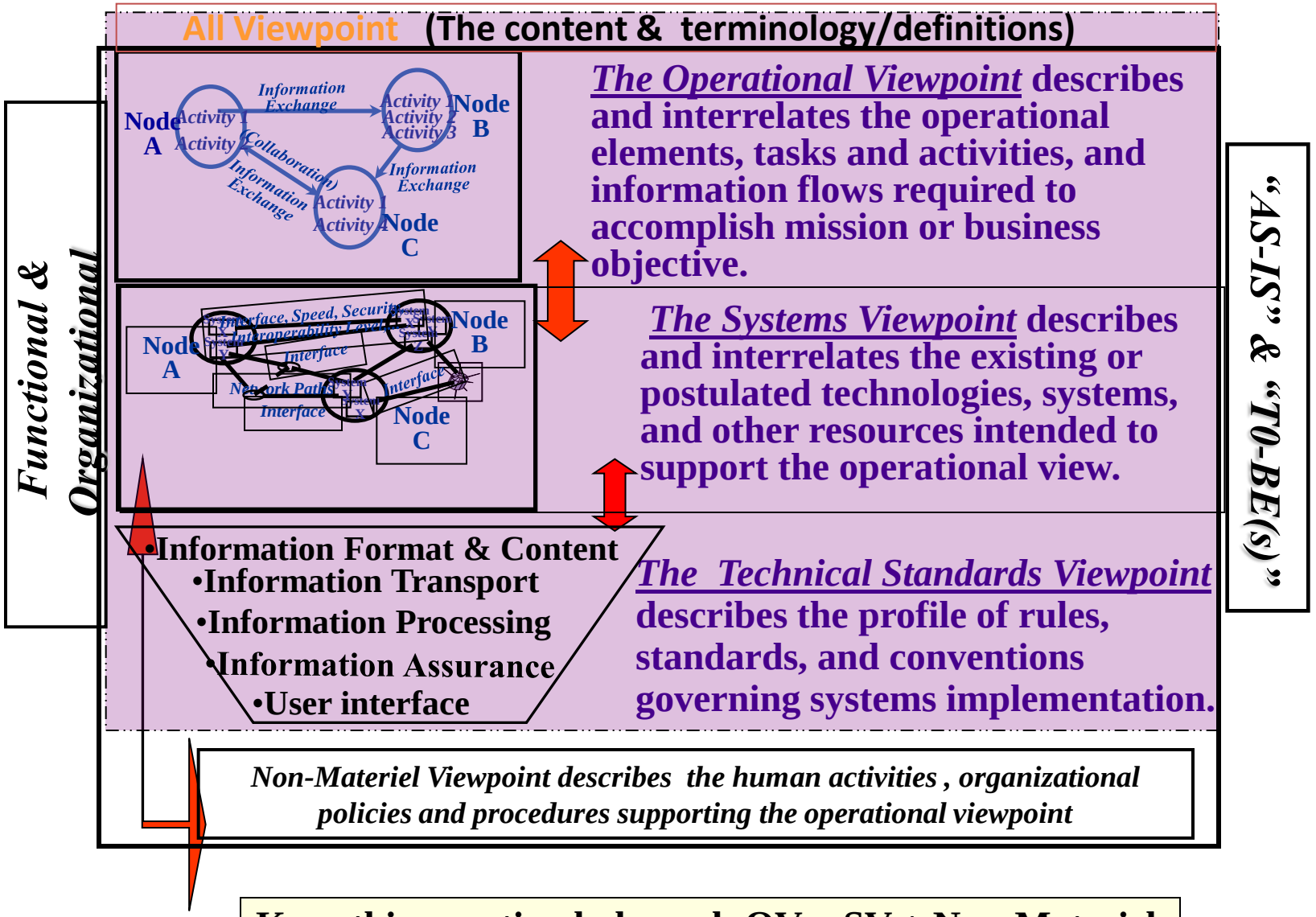
Key Needs:
- Discoverability & availability
- Transport interoperability
- Data/object model interoperability

Key Metrics:
- Urgency:
  - Data/topic latency, service response time, application timeliness
- Priority:
  - Precedence of user requests, data, and services
- Information Assurance (IA)
  - –Data Trust: integrity & availability, fault tolerance, accessibility
  - –Security: data confidentiality, authentication, non-repudiation

Key Needs:
- Network interoperability
- Physical interoperability

Key Metrics:
- Urgency:
  - Transport lag or delay, jitter, packet loss, packet errors
- Priority:
  - Class of service, differentiated service, precedence, preemption, guaranteed service
- Information Assurance:
  - Data Trust: Availability, Connectivity (fixed, mobile)
  - Security: encryption, intrusion detection, authentication, authorization, access control

The ‘A’ Word & Components



Keep this equation balanced: OV = SV + Non-Materiel

Net Enabled Operations

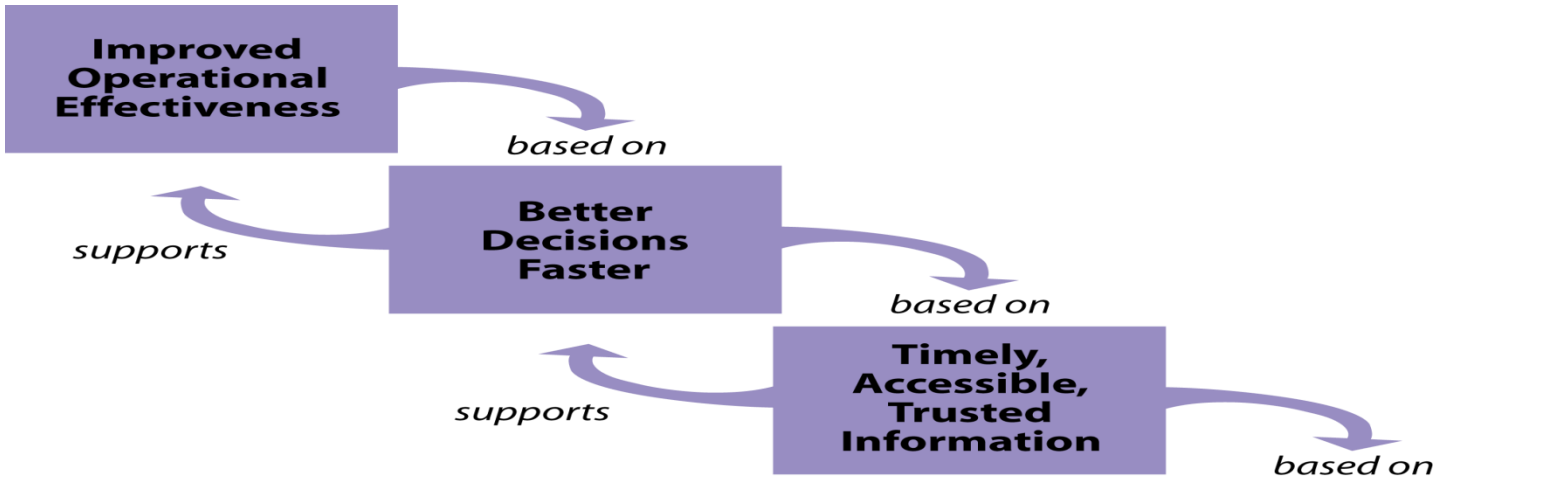
Net Centric Environment: Context

- **Challenge – UNCERTAINTY**
  - **Leave behind the reasonable predictability of the past**
  - **Adjust to an era of surprise and uncertainty**
- **Response – AGILITY & RESILIENCE**
  - **Enterprise-wide: Battlefield Applications; Defense Operations; Intelligence Functions; Business Processes**
  - **Capabilities Based: Access, Share, Collaborate**
  - **Fundamental Changes: Process, Policy, Culture**
  - **Emphasis Shift: From information producer centric to user centric**

Confront Uncertainty with Agility & Resilience

Net Centric Environment (NCE): Objective, Goals & Description

Objective: ***All users, whether known or unanticipated, are able to easily discover, access, trust, and use the data/information that supports their mission objectives unconstrained by their location or time of day.***

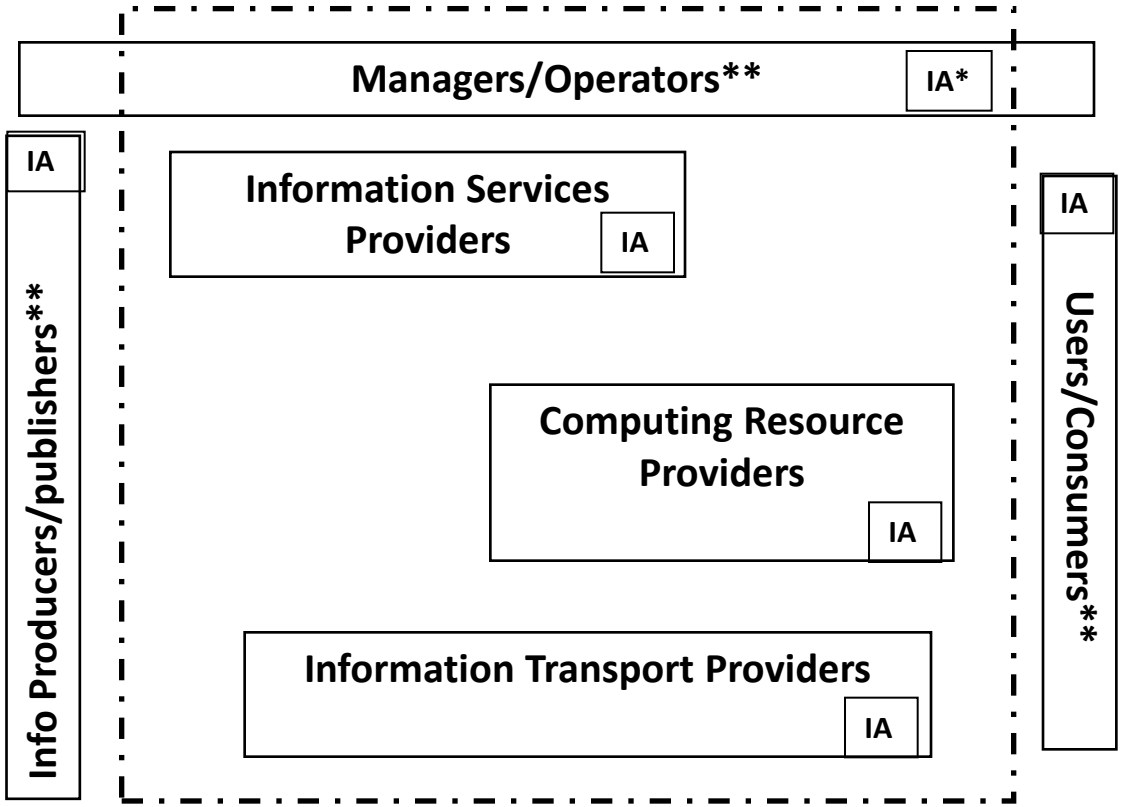


GOALS:

- ***Evolve & Populate the NCE***
- ***Protect & Defend the NCE***
- **Manage & Operate the NCE**

The NCE is implemented with evolving balanced & synchronized sets of Process, Organization, People, Information & Materiel (POPIM) Solutions.

Net Centric Environment: Functional Performers

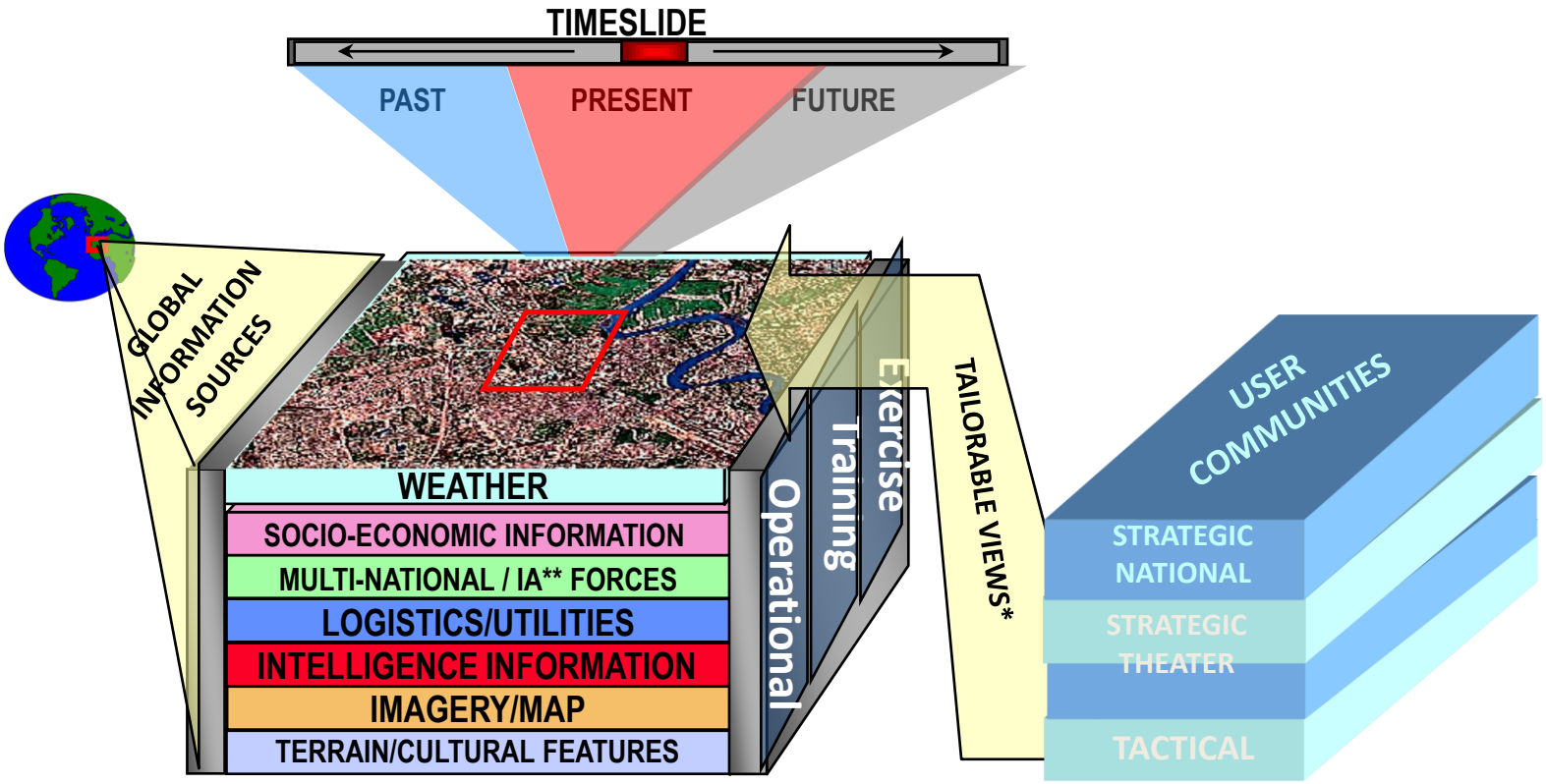


- *Behavior and relationship characteristics include: Quality of Service; Quality of Protection; Addressing; Tagging of content & roles/Identities;*
- *Information Forms include voice, video, images, text, graphics….*

** IA = Information Assurance*

*** Includes Software Applications whether hosted locally or by a computing resource provider.*

Situational Awareness in an NCE



<u>Situational awareness</u> is tailored*, timely, comprehensive, and accurate knowledge of the battlespace (or area of interest) that provides the Warfighter (Commander/Decision maker) a consistent view of all militarily relevant information on friendly (blue) and adversary (red) forces, non-combatants (gray personnel), and the battlespace (or area of interest).

(Notes: *"User Defined Operational Picture": ** IA=Inter-Agency)

Questions ?

Definitions of Functional Performers (1 0f 2)

Computing Resource Provider:

A capability that can respond to a request from a user or another service to store, process, manage, and control data or information (shared and/or distributed) through an external interface.

Information Service Provider:

A capability that can respond to a request from a user or another service to provide a specific functionality, such as the ability to post, discover, access, process and display hosted information and data (including positioning, navigation, and timing services) across the DoD based on established data standards.

Information Provider :

A capability that produces information and data, based on established data standards, and provides that information and data using any of a number of distribution methods, which include bilateral distribution to known users, broadcast (e.g., data link), and publish/post or subscribe/pull models, for use in accomplishing DoD missions.

Definitions of Functional Performers (2 0f 2)

Manager/Operator:

A capability that provides the ability to monitor, manage, control, protect, and configure information transport, information services, and the underlying computing resources that provide end-user services, as well as connectivity to enterprise application services.

User/Consumer:

A capability that utilizes or consumes information transport, computing resources, or information services to perform its intended function.

Information Transport Provider:

A capability that provides the ability to transport information and services via assured end-to-end connectivity across the operational environment.