Net-centric FCB
&
Disruptive Technologies

Dennis Damiens
Net-Centric Capabilities Division
Joint Staff J6

Capability Portfolio Management

Capability Portfolio	CPM Civilian Lead	CPM Military Lead	CPM JS OPR	Functional Capability Bd	SWarF Lead
Command & Control	ASD(NII)	JFCOM	J3	JFCOM	JFCOM
Battlespace Awareness	USD(I)	STRATCOM	J2	J2	STRATCOM
Net-Centric	ASD(NII)	STRATCOM	J6	J6	STRATCOM
Logistics	USD(AT&L)	TRANSCOM	J4	J4	TRANSCOM
Building Partnerships	USD(P)	J5		J5	JFCOM
Force Protection	USD(AT&L)	J8		J8	STRATCOM
Force Support	USD(P&R)	J8		J8	JFCOM
Force Application	USD(AT&L) USD(P)	JROC	J8	J8	JFCOM SOCOM STRATCOM
Corporate Management & Support	D, A&M	DJS		DJS	N/A

NC FCB, CPM, and SWarF Relationship

- Per DEPSECDEF memo dated Feb 07, 2008
  - CPM Civilian Lead: ASD(NII)
  - CPM Military Lead: STRATCOM
  - CPM JS OPR: J6
  - Functional Capability Board: J6
  - SWarF Lead: STRATCOM

NC JCA Tiers 1 and 2

Net-Centric: The ability to provide a framework for full human and technical connectivity and interoperability that allows all DOD users and mission partners to share the information they need, when they need it, in a form they can understand and act on with confidence, and protects information from those who should not have it.

Information Transport	Enterprise Services	Network Management	Information Assurance

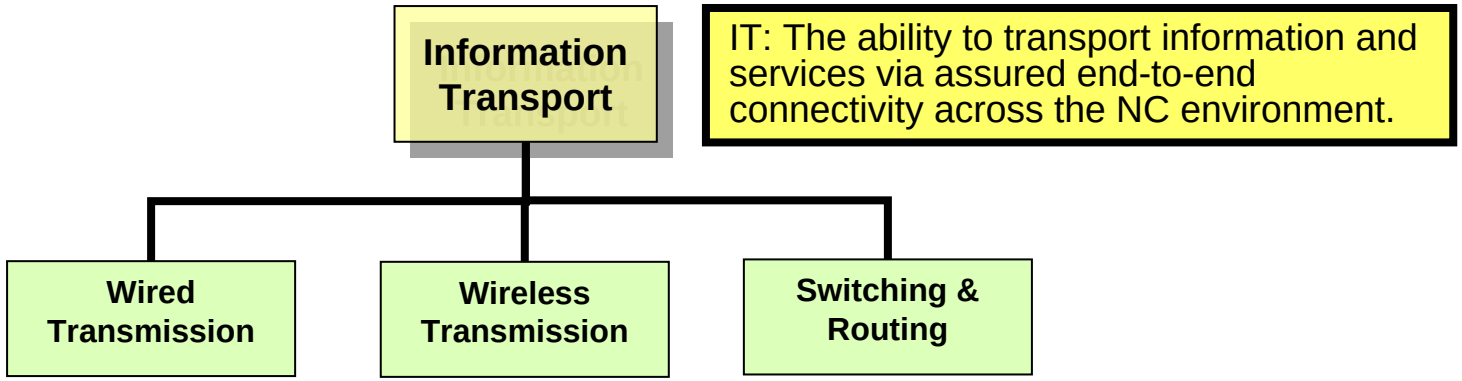
Tier 2's

- **Information Transport (IT):** The ability to transport information and services via assured end-to-end connectivity across the NC environment.
- **Enterprise Services (ES):** The ability to provide to all authorized users awareness of and access to all DOD information and DOD-wide information services.
- **Net Management (NM)**: The ability to configure and re-configure networks, services and the underlying physical assets that provide end-user services, as well as connectivity to enterprise application services.
- **Information Assurance (IA):** The ability to provide the measures that protect, defend and restore information and information systems.

Legend: Tier 1 Tier 2 Tier 3 Tier 4

Tier 2 & 3

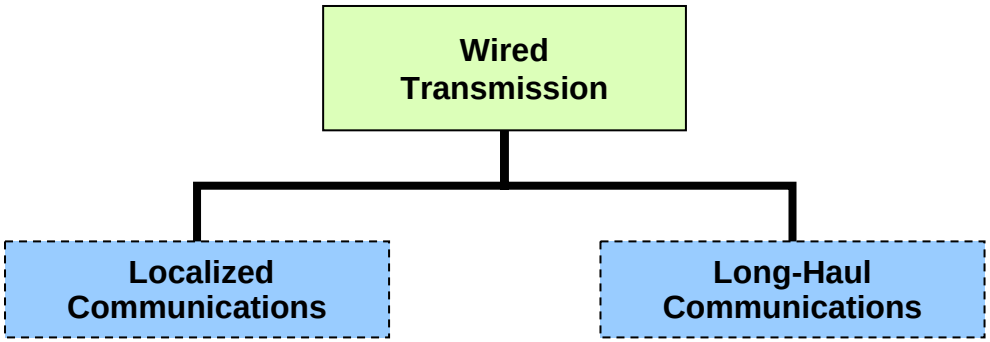
Information Transport



- **Wired Transmission**: The ability to transfer data or information with a electrical/optical conductor.
- **Wireless Transmission**: The ability to transfer data or information without an electrical/optical conductor.
- **Switching and Routing**: The ability to move data and information end to end across multiple transmission media.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Information Transport Tier 4 - Wired Transmission



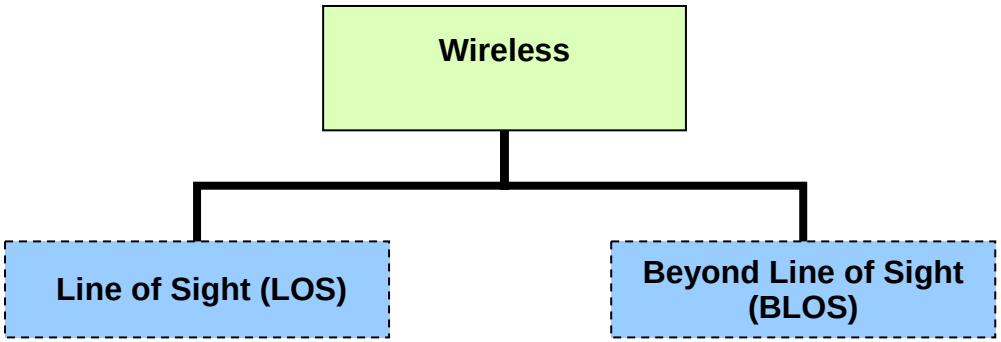
Wired Transmission: The ability to transfer data or information with an electrical/optical conductor.

Localized Communications: The ability to disseminate, transmit, or receive voice, data, video and integrated telecommunications via wire or optical means within the confines of a platform or an installation (e.g., command post, post, camp, station, base, installation, headquarters, or Federal building).

Long-Haul Telecommunications: The ability to disseminate, transmit, or receive voice, data, video and integrated telecommunications via wire or optical means to, from and between platforms and/or installations (e.g., command post, post, camp, base, stations or federal buildings).

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Information Transport Tier 4 - Wireless

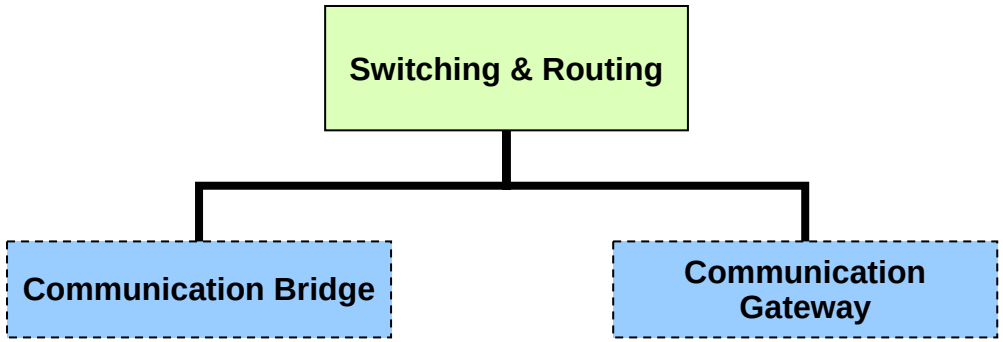


Wireless- The ability to transfer data or information without an electrical/optical conductor.

Line of Sight – The ability to exchange data or information via electro-magnetic spectrum within line of sight.

Beyond Line of Sight – The ability to exchange data or information via electro-magnetic spectrum beyond line of sight.

Information Transport Tier 4 – Switching & Routing



Switching and Routing – The ability to move data and information end to end across multiple transmission media.

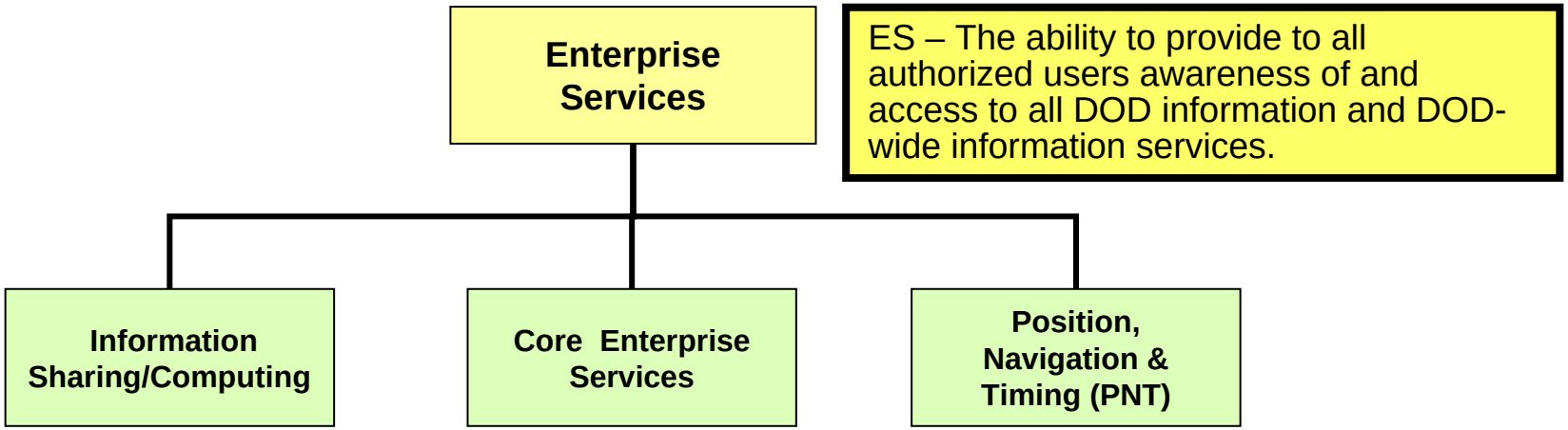
Communication Bridge – The ability to interface two or more common communications media or networks.

Communication Gateway – The ability to interface two or more disparate communications media or networks.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Tier 2 & 3

Enterprise Services

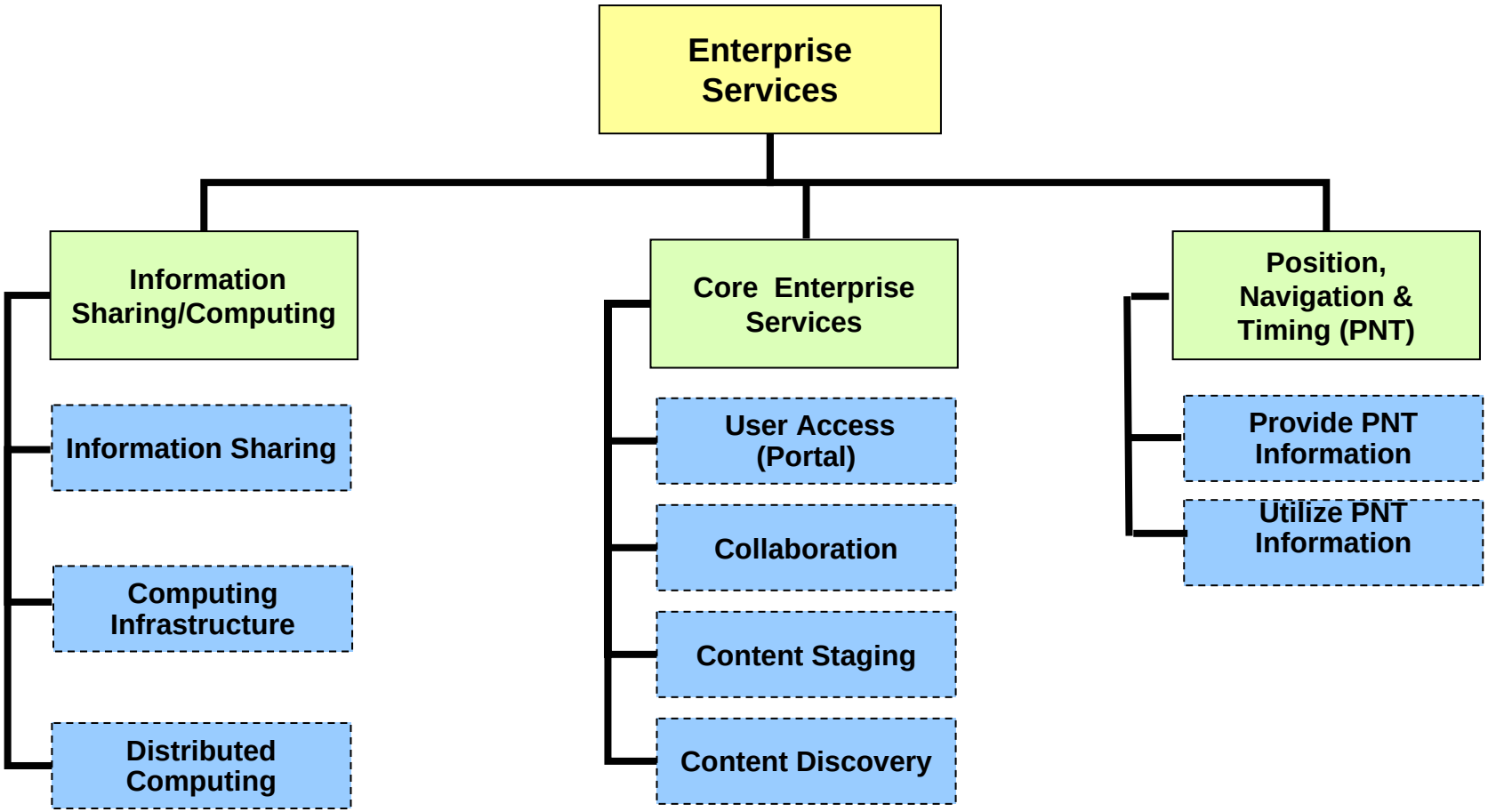


- **Information Sharing/Computing**: The ability to provide physical and virtual access to hosted information and data centers across the enterprise based on established data standards.
- **Core Enterprise Services**: The ability to provide awareness of, access to and delivery of information on the GIG via a small set of mandated services.
- **Position, Navigation, and Timing (PNT):** The ability to determine accurate and precise location, orientation, time and course corrections anywhere in the battlespace and to provide timely and assured PNT services across the DoD enterprise.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

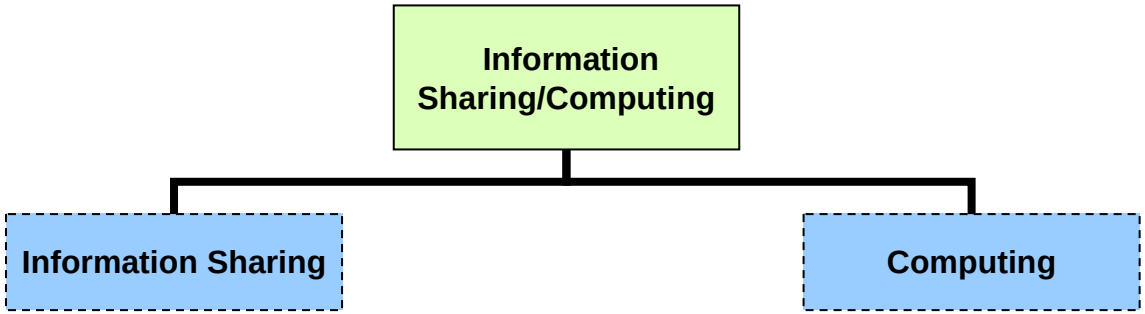
Enterprise Services

Tier 2 & 3



Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Enterprise Services JCA Tier 4/5 – Information Sharing/Computing

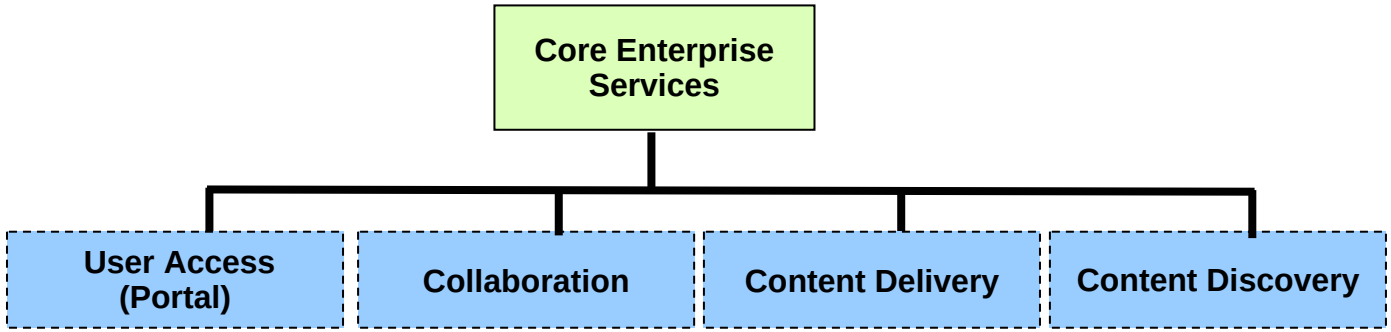


(3) Information Sharing/Computing: The ability to provide physical and virtual access to hosted information and data centers across the enterprise based on established data standards.

(4) Information Sharing – The ability to establish a trusted environment that promotes information sharing, extends the DOD Information Enterprise to DOD mission partners and accommodates unanticipated partners and events.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Enterprise Services JCA Tier 4 – Core Enterprise Services

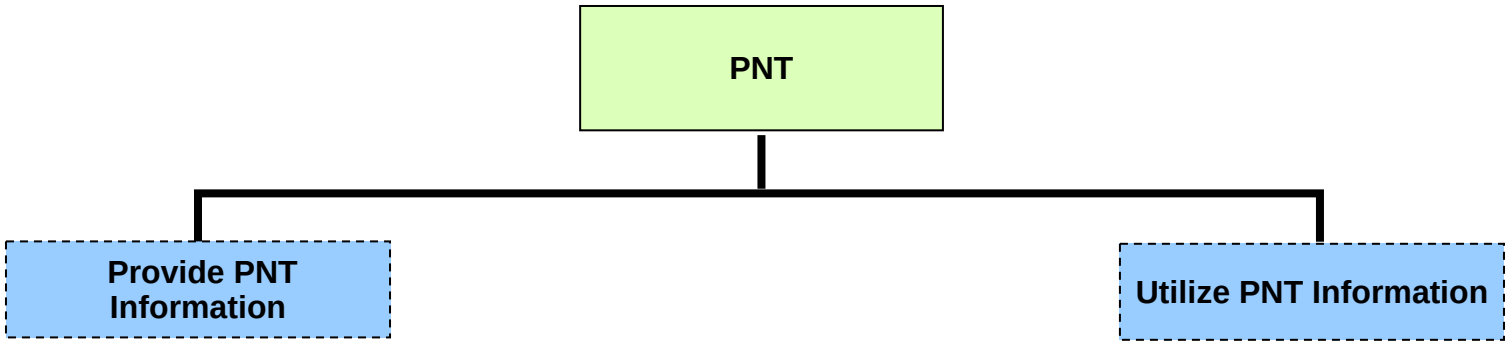


Core Enterprise Services – The ability to provide awareness of, access to and delivery of information on the GIG via a small set of CIO mandated services.

- **User Access (Portal) – The ability to access user defined DoD Enterprise Services through a secure single entry point.**
- **Collaboration – The ability to conduct synchronous communication and asynchronous file sharing across the enterprise, including voice, text, video, and manipulated visual representation.**
- **Content Delivery – The ability to accelerate delivery and improve reliability of enterprise content and services, by optimizing the location and routing of information.**
- **Content Discovery – The ability to identify/ search for/locate relevant information**

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Enterprise Services JCA Tier 4 – Position Navigation and Timing (PNT)



Position, Navigation, and Timing – The ability to determine accurate and precise location, orientation, time and course corrections anywhere in the battlespace and provide timely and assured PNT services across the DOD enterprise.

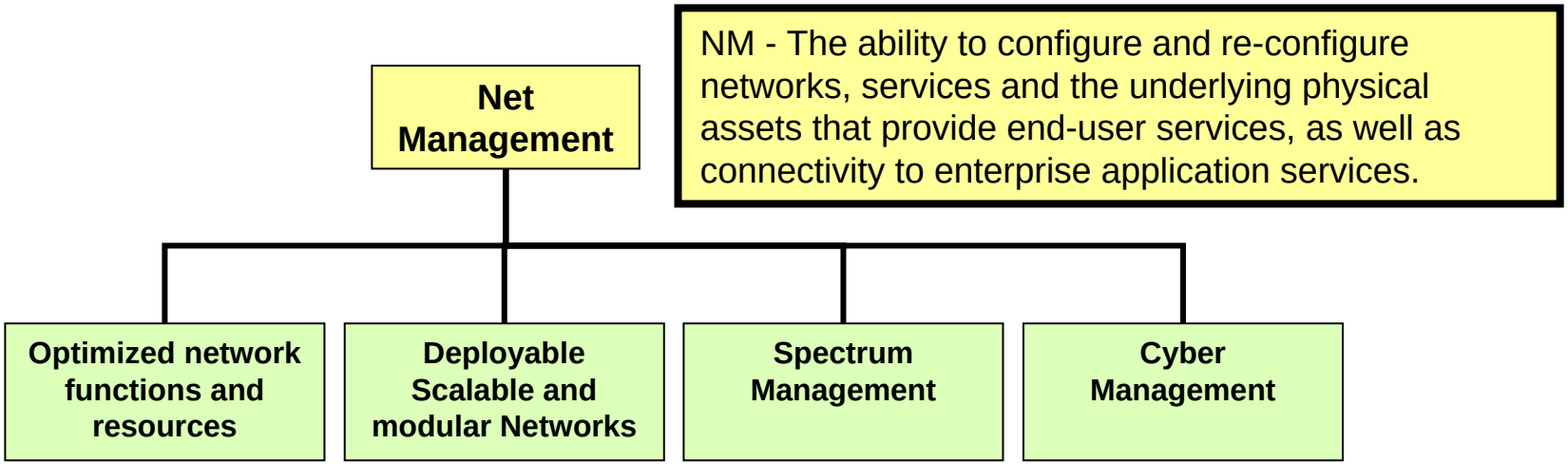
Provide PNT Information: The ability to provide and control temporal and spatial reference information.

Utilize PNT Information: The ability to acquire and apply temporal and spatial reference information to produce continuous PNT solutions.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Tier 2 & 3

Net Management

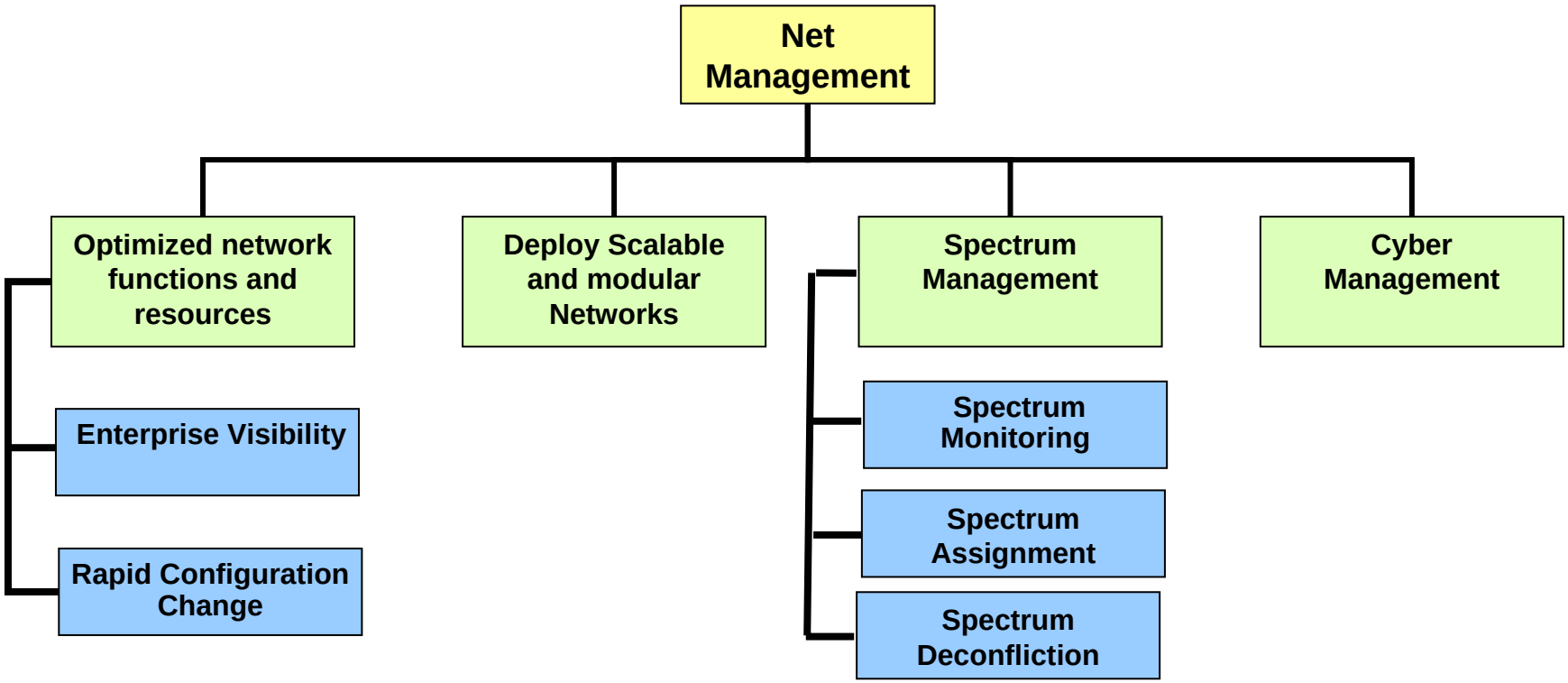


- **Optimized network functions and resources**: The ability to provide DOD with responsive network functionality and dynamically configurable resources, to include allocation of required bandwidth, computing and storage.
- **Deployable scalable and modular networks:** The ability to design, assemble, transport, and establish mission-scaled networks from adaptable components network modules.
- **Spectrum Management**: The ability to synchronize, coordinate, and manage all elements of the electromagnetic spectrum through engineering and administrative tools and procedures.
- **Cyber Management:** The ability to assure network support for all DOD missions through the synchronization, deconfliction, coordination and awareness of all the elements of computer network operations.

Legend: Tier 1 Tier 2 Tier 3

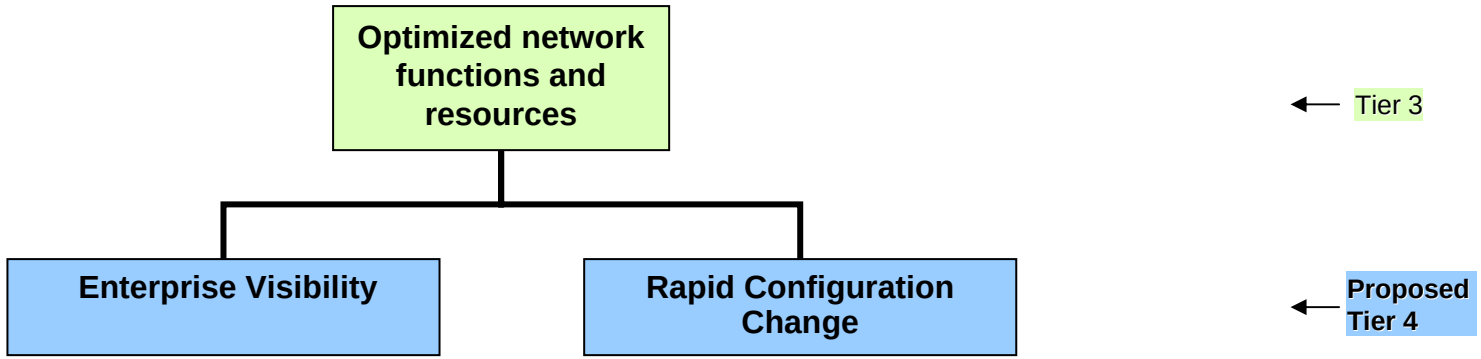
Net Management

Tier 4



Legend: Tier 1 Tier 2 Tier 3

NC Net Management JCA Tier 4 – Optimized network functions and resources



Optimized network functions and resources– The ability to provide DOD with responsive network functionality and dynamically configurable resources, to include allocation of required bandwidth, computing and storage.

Enterprise Visibility: The ability to determine real time status and effectiveness of network services and resources.

Rapid Configuration Change: The ability to rapidly configure and reconfigure enterprise services and resources in concert with the established CONOPS.

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NC Net Management JCA Tier 4 – Deployable Scalable and Modular Networks

Deployable Scalable and Modular Networks

← Tier 3

Deployable Scalable and Modular Networks– The ability to design, assemble, transport, and establish mission-scaled networks from adaptable components network modules.

No Tier 4's – NETOPS tasks will align with UJTLs (revisions to UJTLs recommended by Network Management / Spectrum Management Functional Solutions Analysis)

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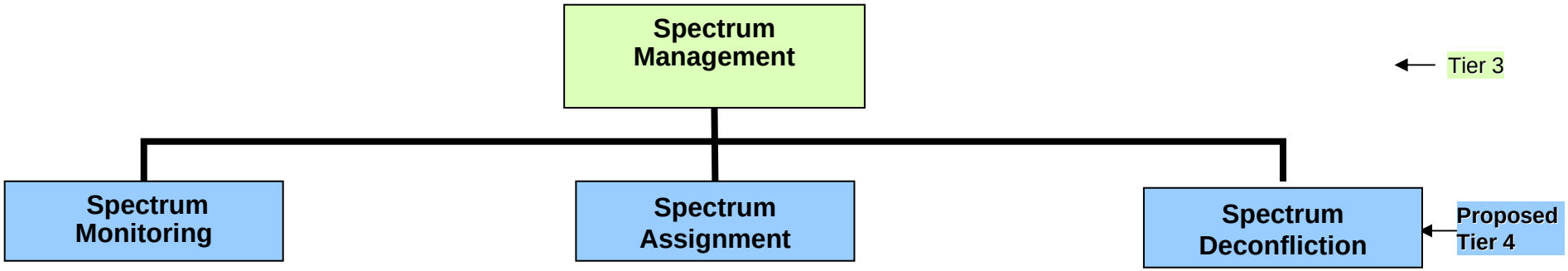
NC Net Management JCA Tier 4 – Spectrum Management



Spectrum Management– The ability to synchronize, coordinate, and manage all elements of the electromagnetic spectrum through engineering and administrative tools and procedures.

- **Spectrum Monitoring - Ability to identify spectrum requirements, evaluate electromagnetic environmental effects (E3), and monitor spectrum use.**
- **Spectrum Assignment - Ability to dynamically manage, modify, and allot frequency assignments.**
- **Spectrum Deconfliction - Ability to dynamically predict, detect, and deconflict frequency interference.**

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NC Net Management JCA Tier 4 – Cyber Management

← Tier 3

Cyber Management– The ability to assure network support for all DOD missions through the synchronization, deconfliction, coordination, and awareness of all elements of computer network operations.

No Tier 4's - this is an "artifact" from the CNA/CND/CNE issue, with required capabilities covered under "Optimized network functions and resources" Tier 4s

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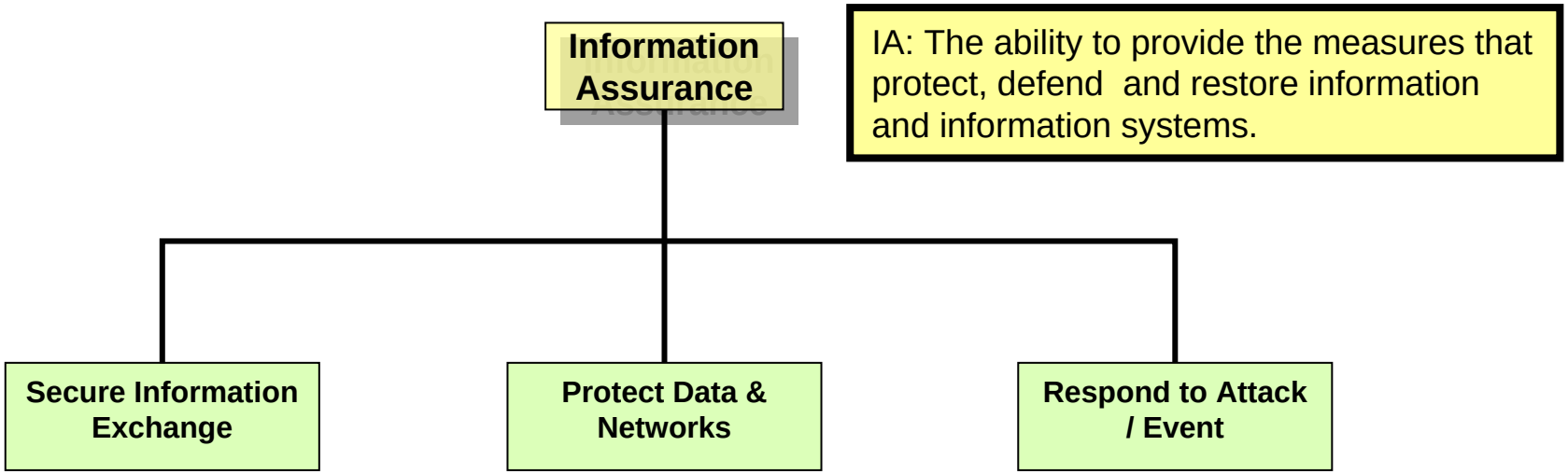
Tier 2 & 3

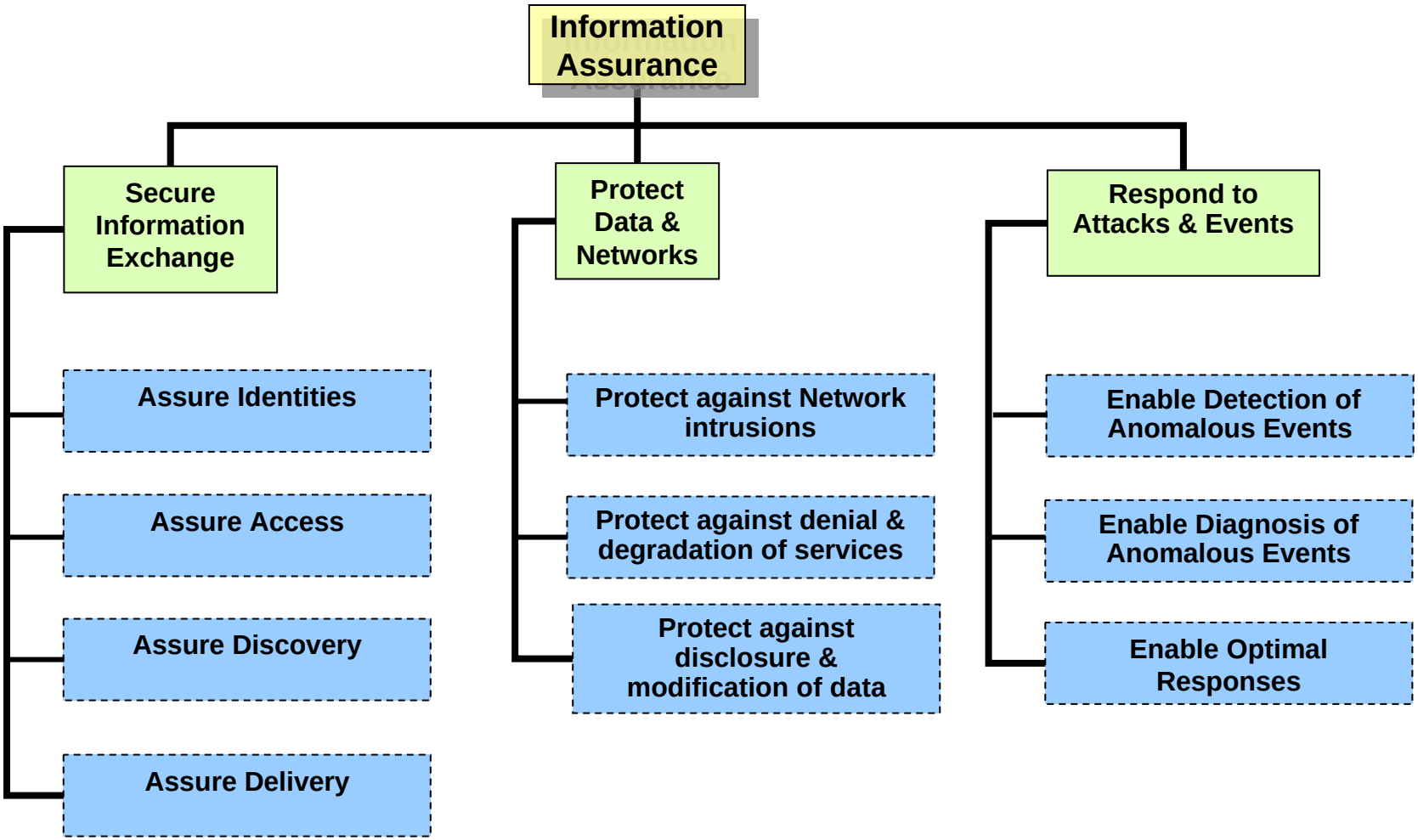
Information Assurance



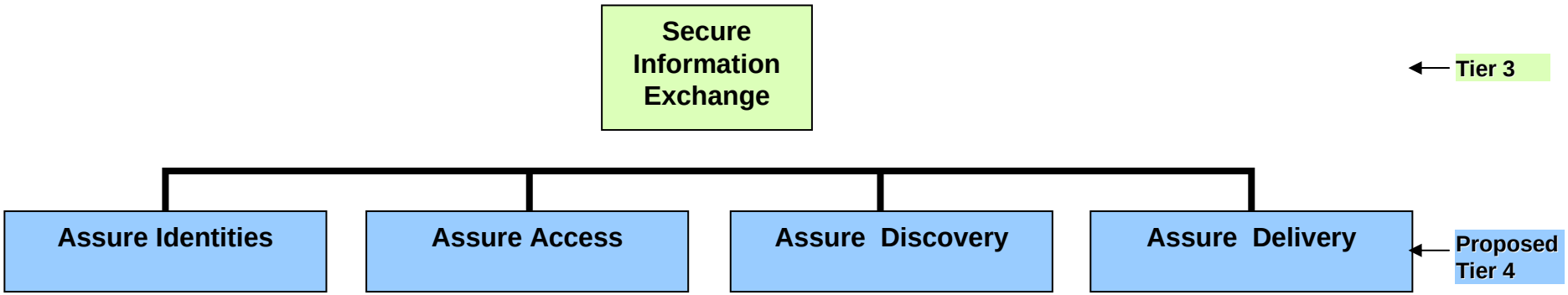
- **Secure Information Exchange:** The ability to secure dynamic information flow within and across domains.
- **Protect Data and Networks:** The ability to anticipate and prevent successful attacks on data and networks.
- **Respond to Attack / Event:** The ability to maintain services while under cyber-attack, recover from cyber-attack, and ensure availability of information and systems.

Legend: Tier 1 Tier 2 Tier 3 Tier 4

IA JCA Tier 4


Information Assurance
Secure Information Exchange
Protect Data & Networks
Respond to Attacks & Events
Assure Identities
Assure Access
Assure Discovery
Assure Delivery
Protect against Network intrusions
Protect against denial & degradation of services
Protect against disclosure & modification of data
Enable Detection of Anomalous Events
Enable Diagnosis of Anomalous Events
Enable Optimal Responses

IA JCA Tier 4 Secure Information Exchange



Secure Information Exchange – the ability to secure dynamic information flow within and across domains

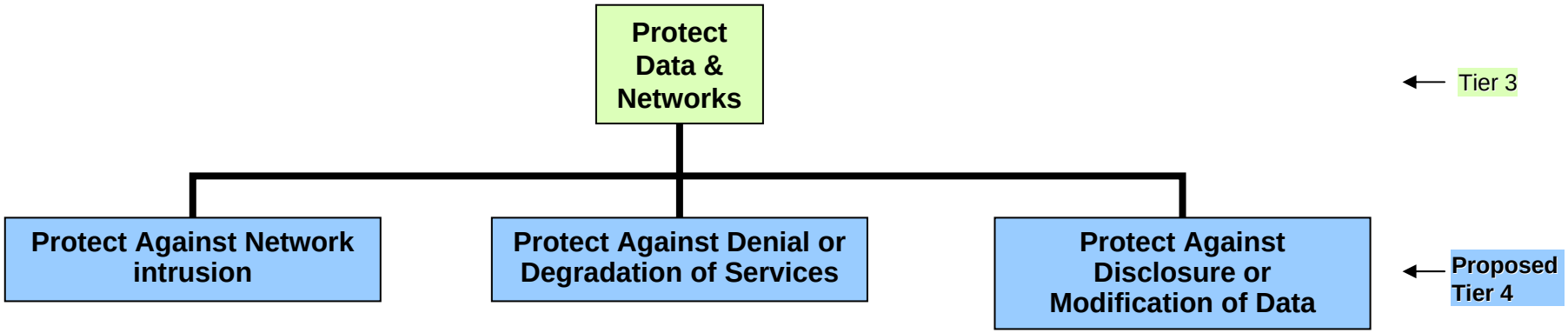
- **Assure Identities – the ability to accurately and reliably associate individuals, groups, and entities with their operational roles and authorities.**

- **Assure Access – the ability to ensure information access is managed based upon governing authorities.**

- **Assure Discovery – the ability to allow information to be discovered by individuals, groups, and entities based upon operational roles and authorities.**

- **Assure Delivery – the ability to exchange authentic data, information, and knowledge between authorized individuals, groups, and entities.**

IA JCA Tier 4 Protect Data & Networks



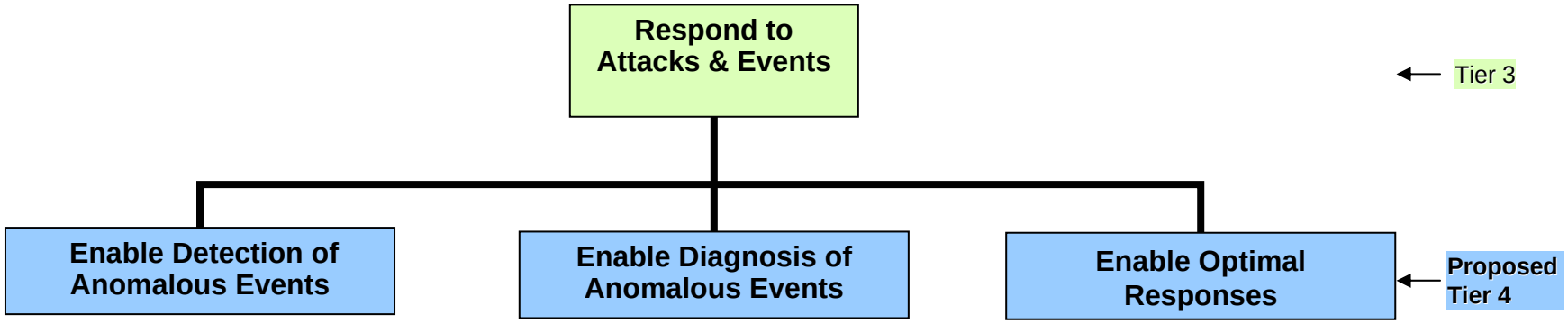
Protect Data & Networks – The ability to anticipate and prevent successful attacks on data and networks

-Protect Against Network Intrusion– the ability to prevent unauthorized access at the boundary and host.

- Protect Against Denial or Degradation of Services – the ability to prevent or contain activities which may degrade or deny authorized use of network services.

- Protect Against Disclosure or Modification of Data – the ability to prevent or contain activities which may expose or modify data during processing, at-rest, and/or in-transit.

IA JCA Tier 4 Respond to Attack Events



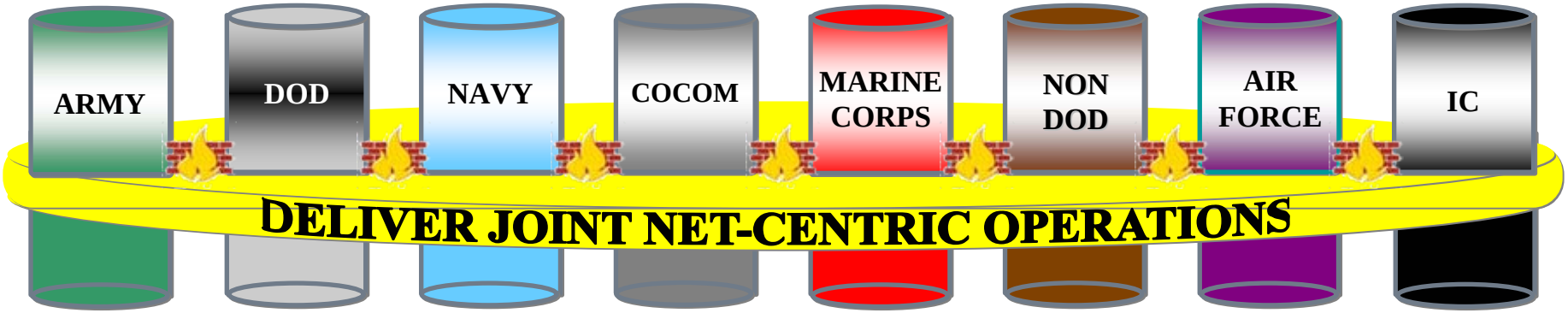
Respond to Attack Events – The ability to maintain services while under cyber-attack, recover from cyber-attack, and ensure availability of information and systems

-Enable detection of anomalous events – the ability to identify inappropriate events by continuous enterprise monitoring and searching for suspect activities.

-Enable diagnosis of anomalous events – the ability to logically characterize events and assess their impacts.

- Enable optimal responses – the ability to generate changes necessary to return networks / services to their normal operational states.

Today's Environment



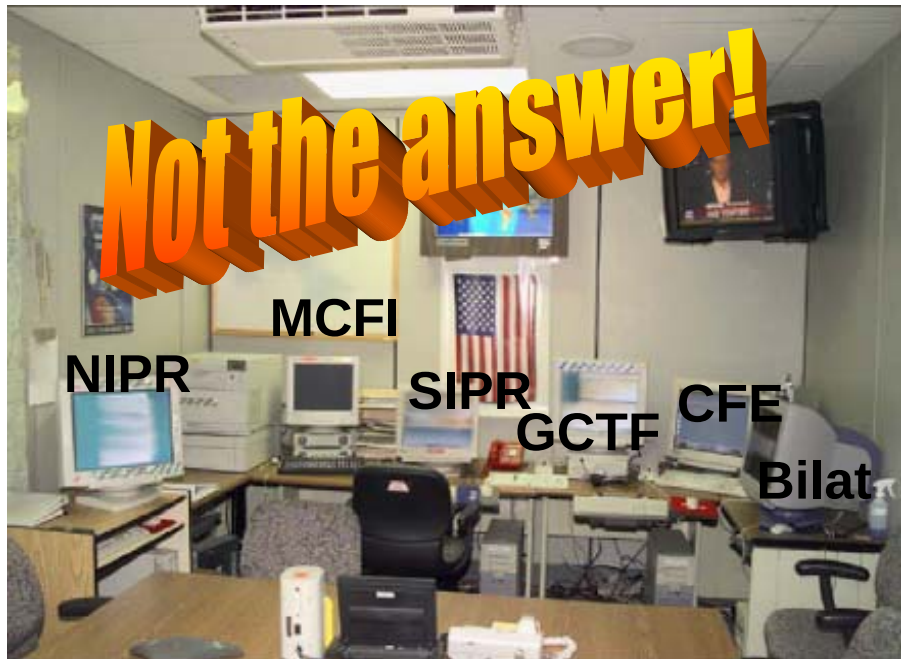
We are still stove-piped – organize vertically, fight horizontally

The Joint Force Commander

Today's Network Integrator

Is Faced With:

- **Multiple infrastructures and associated hardware**
- **Inconsistent Security Postures**
- **Multiple NETOPS constructs; impeded global capability**
- **Information Sharing Requirements**



GIG 2.0 - Warfighter Focused

Information Environment
Optimized for the Warfighter
Facilitates Force Integration

GIG 2.0

Global Authentication,
Access Control,
& Directory Services

Information &
Services
"From the Edge"

Joint
Infrastructure

Tactical Edge

Agility & Versatility of
the Information Environment
Supports Operational Reach &
Synergy of the Force

Delivers the Information
Advantage that ensures
Freedom of Action

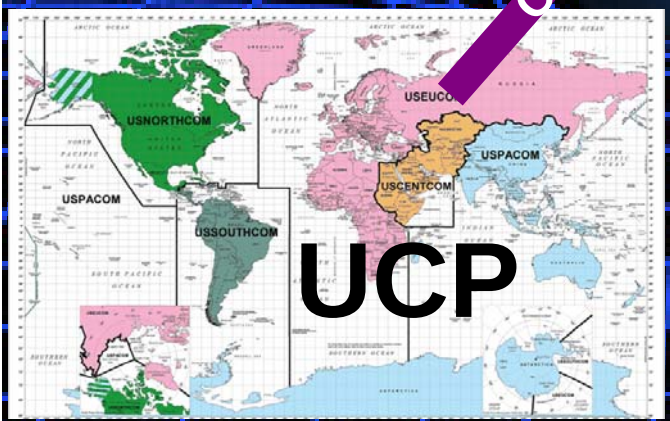
Unity of Command

C2

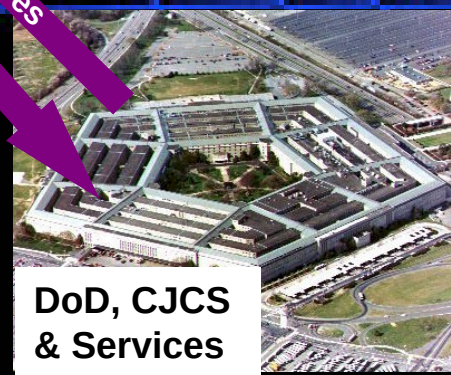
Resources

Requirements

Common Policies
& Standards



UCP



DoD, CJCS
& Services

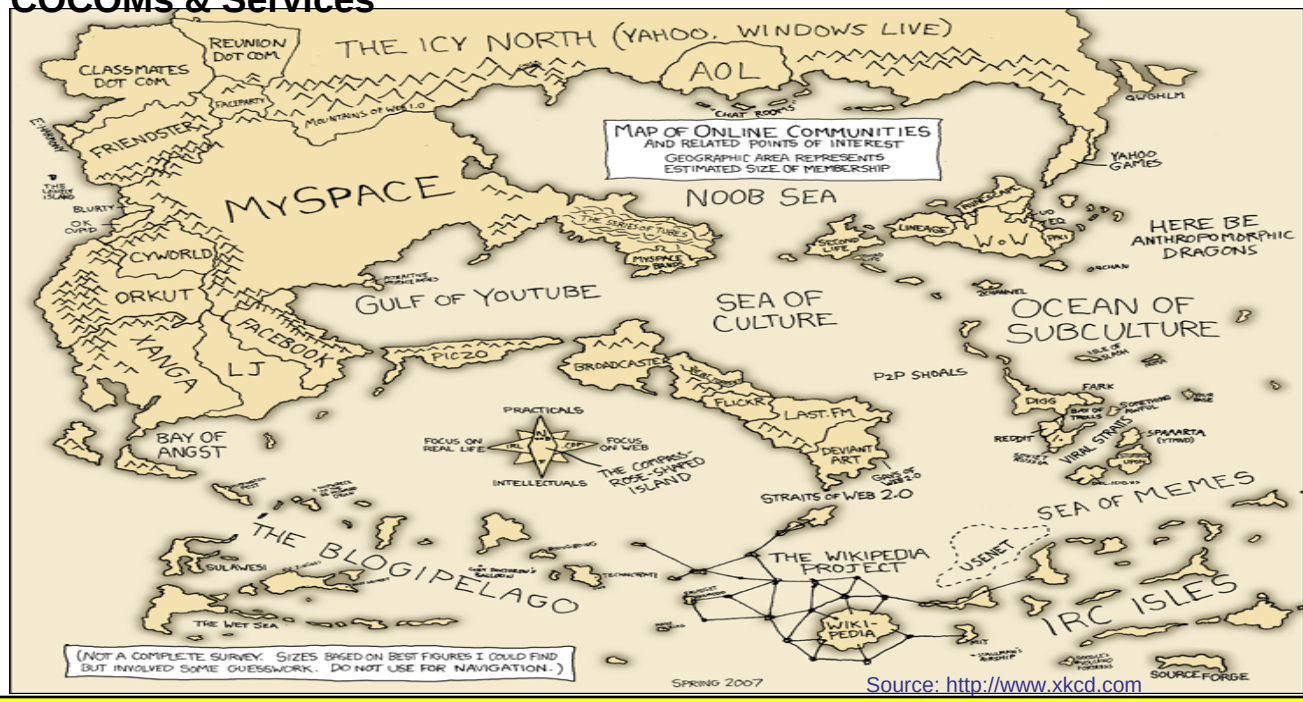
Access to Required Information
Anytime & Anywhere creating Faster
Decision Cycles

Final Thoughts

- **GIG 2.0 is the new information environment**
  - **Published Strategic Vision**
  - **Opportunities across multiple COCOMs**
    - **Build the Strategy, CONOPS and Architecture**
    - **Influence the Joint Basing effort**
    - **Address Network Policies and Standards**
    - **Achieve joint basing effects at the tactical edge**
    - **Strengthen support from COCOMs & Services**

- **We must change**
  - **Our culture**
    - **Trust vs. Risk**
  - **Acquisition process**
    - **Service vs. Combined/Coalition/ Interagency/Joint**

  in order to make GIG 2.0 a reality



Source: http://www.xkcd.com

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change." **– Charles Darwin**

Net-centric JCA References

J68 POCs:

COL Charles Gabrielson, Chief

Mr. Dennis Damiens, Deputy

LtCol Jim Kelley,

Phone: 703-693-9195

NIPR email: james.kelley@js.pentagon.mil

Ms. Jen Zurowski
Phone: 703-693-9195
NIPR email: jennifer.zurowski@js.pentagon.mil

Backups

Assumptions / Clarifications

- C2 provides the following generic capabilities to all JCAs
  - Planning
  - Direction
  - Monitoring
- Under Planning, the approved CONOPS that is generate includes description of the full spectrum of JCA capabilities employed to include aspects of Information Operations core capabilities of Electronic Warfare and Computer Network Operations

Core Enterprise Services JCA Tier 5 – Service Oriented Architecture Foundation

Service Oriented Architecture Foundation

Mediation – The ability to Exchange data with unanticipated users in unanticipated formats. Web service for creating and executing XML transformations. Provides mission-to-mission data transformation, protocol adaptation, and service orchestration capabilities

Machine-to-Machine Messaging – Capability for publishing data for the purposes of machine consumption. Asynchronous point-to-multi-point event notification including alerts, track updates, etc. using multiple messaging models (Publish/Subscribe/queuing/peer-to-peer). Producers do not have to keep track of consumers

Enterprise Service Management – The ability to ensure that enterprise services are available and reliable. Service that monitors and manages current NCES web services by controlling which web service instance is called based on the monitored status. Collects and displays information related to a service's planned and actual status, health and performance

Metadata Discovery – Capability for making structural and semantic assets visible, accessible, and understandable and locating existing assets using a uniform set of metadata to describe data assets across the DoD

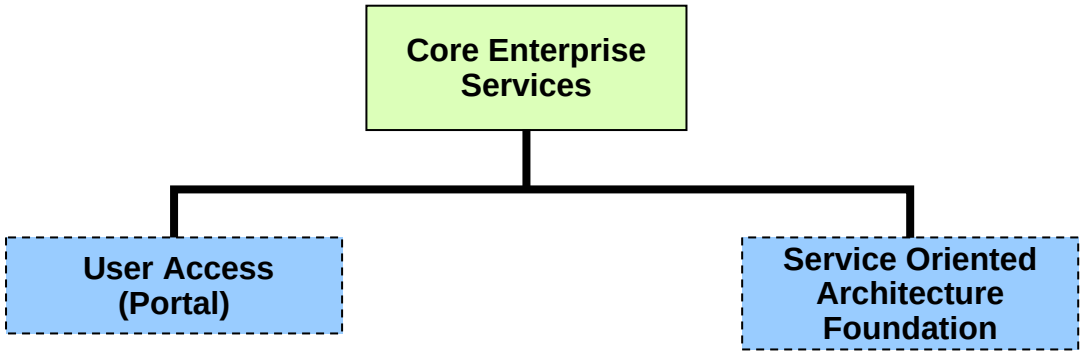
People Discovery – Provides a service to find people in an enterprise-wide white pages directory. User information is provided by Joint Enterprise Directory Services (JEDS), which aggregates a number of DoD repositories of user information

Service Discovery – Ability to develop and reuse capabilities regardless of platform with increased flexibility and agility. Enables Web services and service specifications to be published, categorized and discovered within the NCES enterprise service registry

Service Security –Verifies that each web service is able to securely communicate with other web services using the NCES Security Specification and provides services for performing certificate validation and access control decisions.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

NC Enterprise Services JCA Tier 4 – Core Enterprise Services



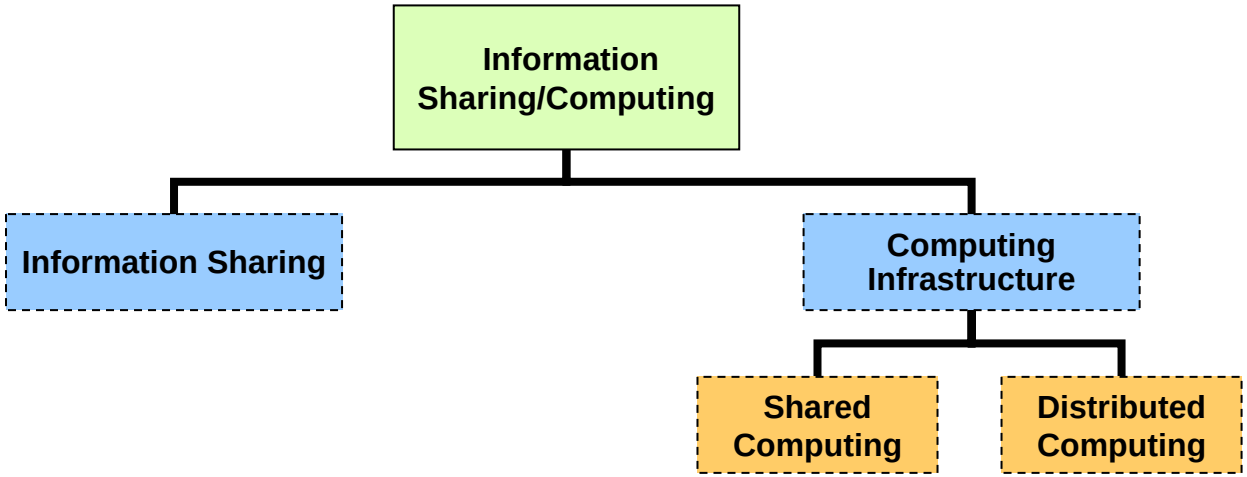
Core Enterprise Services – The ability to provide awareness of, access to and delivery of information on the GIG via a small set of CIO mandated services.

- <u>DOD Information Enterprise Services</u>: The ability for all information systems to use a mandatory set of shared services whose usage is standardized across the entire enterprise to facilitate Net-Centric information exchanges and eliminate unnecessary duplication of effort

- <u>DOD Shared Information Services</u>: The ability of formal and ad-hoc communities to make use of non-mandatory services, shared at the enterprise level, to increase the speed and agility with which new Net-Centric capabilities can be fielded across the enterprise via the re-use of shared services.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

Enterprise Services JCA Tier 4/5 – Information Sharing/Computing



(3) Information Sharing/Computing: The ability to provide physical and virtual access to hosted information and data centers across the enterprise based on established data standards.

(4) Computing Infrastructure: The ability to acquire, store, process, manage, control and display data or information (shared and/or distributed).

(5) Shared Computing: The ability to provide shared computing processing and storage resources.

(5) Distributed Computing: The ability to provide a virtual computing capability to an end user or application through federation of distributed, location-independent computing resources.

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

NC IT JCA Tier 5 - Wired Transmission

(4) Base Communications

- **(5) BL Voice transport & Customer Premise Equipment (CPE)**
- **(5) BL Video transport & CPE**
- **(5) BL Data transport & CPE**
- **(5) BL Converged services transport & CPE**

(4) Long-Haul Telecommunications

- **(5) LH Voice transport & Customer Premise Equipment (CPE)**
- **(5) LH Video transport & CPE**
- **(5) LHL Data transport & CPE**
- **(5) LH Converged services transport & CPE**

Legend: Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

NC IT JCA Tier 4 – Switching and Routing

(3) Switching and Routing – The ability to move data and information end to end across multiple transmission media.

- **(4) Circuit Switching**
- **(4) Packet Switching**
- **(4) Routing**
  - **(5) Centralized Routing**
  - **(5) Distributed Routing**
  - **(5) Source-based Routing**
  - **(5) Hop-by-hop Routing**
  - **(5) Single Path Routing**
  - **(5) Multi-path Routing**

(Recommendation to base Tier 4 on basic routing / bridging / switching ability description – less solution specific)

NII Lead: Raj Rajmohan