

# How to fill Technology Gaps in DoD

# Agenda

- Innovation Drivers & Role of CTO
- Technology Management Framework
- GIG Convergence Master Plan
- Technology Watchlist & Gaps
- How to Participate
- Initiatives
- Contacts





# Innovation Drivers & Role of CTO





# NCW Stilling Driving Innovation

- Admiral Arthur Cebrowski & Mr. John Garstka developed a paper *Network Centric Warfare: Its origin and Future* in Jan 1998 at the United States Naval Institute (USNI)
  - Fundamental shift from *platform-centric* to *network-centric* warfare
  - The shift from viewing actors as independent to viewing them as part of a continuously adapting ecosystem
  - The importance of making strategic choices to adapt or even survive in such changing ecosystems
- To realize Network Centric Warfare (NCW), a Network Centric Operations Environment needs to be established using the following key tenants
  - **1. Net Centric Data Goals** (*DoD Net-Centric Data Strategy 2003*) Visible, Accessible, Institutionalize, Understandable, Trusted, Interoperable, Responsive to User Needs
  - **2. Net Centric Service Goals** (*DoD Net-Centric Service Strategy 2007*) Provide services, use services, govern infrastructure and services, monitor and manage service via GIG NetOps
  - **3. the Global Information Grid (GIG).** (*DoD IT Enterprise Strategy 2011*) “a single information environment...to a more seamless, unified, and integrated net-centric environment”

***“Network-Centric Operations represent a powerful set of warfighting concepts associated military capabilities that allow warfighters to take full advantage of all available information and bring all available assets to bear in a rapid and flexible manner.”***

**Reference: Kramer, F., Starr, S. and Wentz, L. (n.d.). Cyberpower and National Security.**

## Recognized DoD IT Issues a Close 2nd

- I. Information Assurance (IA) as it relates to managing risks associated with the use, processing, storage, and transmission of information and data
- II. Tactical Edge communications and computing constraints related to the tactical and intermediate environments (disconnected or intermittent connectivity, limited throughput, high latency and jitter, and low-power requirements)
- III. Mobile Communications & Computing, and the explosion of end-user owned devices in the workplace, on the road and at home
- IV. The increasing cost of IT infrastructure due to the proliferation of networks, computing, applications and end-user devices throughout DoD and the resulting need for infrastructure consolidation at an enterprise level
- V. The challenges in supporting legacy applications and data assets
- VI. Providing real-time situational awareness, protection, and operational management (NetOps) in a holistic way



# Technology Management Framework





# DISA Chief Technology Office (CTO)

## Roles and Responsibilities

*Goal: To perform reconnaissance, assessments, prototyping, and tracking of technologies across the community to implement a high-performance information grid, data services for exposing information sources, and infrastructure and C2 services for enabling a more integrated and self-synchronizing warfighter, intelligence, and business community across levels of commands for institutionalizing NCOE in the Department of Defense (DOD)*

Approach:

- Identify customer needs working through PEO's and COCOMs to identify technology gaps and establish Technology Watchlist
- Conduct technology reconnaissance and assessment operations based on these customer priorities
- Establish Technology Management Framework (TMF) for correlating services, capabilities, and technology assessments
- Publish and maintain up-to-date information in TMF
- Leverage TMF to support COCOM TDs and DISA Chief Engineers (PEO-C2C, PEO-NS, PEO-MA, PEO-ES) to rapidly deliver innovation to the Warfighter



## Advanced Technology Identification & Insertion Process (ATIIP)/Technology Management Framework (TMF)



### DISA CTO Vision:

**Advance the adoption of emerging technologies through effective Technology Management principles & practices**

### Joint Enabler 2.3: Engineering

**ATIIP:** “...defines the methodology for DISA to manage its entire technology life cycle, and it will identify key technical areas for DISA to investigate and monitor for potential transition into programs”

**TMF:** “Early identification of technology needs will be managed... [and] translated as necessary into ideas and concepts that can be reviewed and studied [via managed analysis artifacts]...”

**TMF (PRI 2.3.1):** “...will provide leadership with current technology situational awareness, and will provide a method of capturing and conveying the Agency’s technology needs. ...TMF will provide the programs and projects with the means to identify and assess viable technology solutions, as well as support necessary TRA efforts. ...TMF will ensure the Agency optimizes its investments, including time, funding, and engineering resources.”

**The Chief Technology Officer (CTO) has the responsibility for defining the overall technical strategies for the Defense Information Systems Agency (DISA). These strategies are the basis for the development, sustainment, and operations of critical net-centric products and services provided by DISA.**

**The CTO provides technical review and oversight of DISA’s efforts to ensure they are in accordance with established strategies and executed using sound system engineering techniques.**



# DISA Campaign Plan - Lines of Operation

- **Enterprise Infrastructure:** An agile converged enterprise infrastructure provides a collaborative and trusted environment to enable end-to-end information sharing that is capable of adapting to rapidly changing conditions.

## **PRIORITIES**

- Deliver an integrated platform consisting of DoD's core communications, computing, and information services
  - Integrate terrestrial, wireless, and satellite communications.
  - Provide an enterprise computing platform and services to the Department
  - Leverage technology and integrate capabilities to optimally operate and assure the enterprise infrastructure.
- **Operate and Assure:** Dynamic control and operation of our enterprise infrastructure and the command and control and information sharing abilities and services.

## **PRIORITIES**

- Operate and assure the enterprise infrastructure and execute C2 and information sharing capabilities to enable critical missions
  - Optimize mission partner engagement and synchronize DISA services and
  - Enhance DISA's ability to execute continuity of operations (COOP) plans
- **Command & Control ^ Information Sharing:** Effective, reliable, secure, agile, national, and operational command and control and information sharing capabilities and services that adapt to rapidly changing circumstances.

## **PRIORITIES**

- Evolve C2 capabilities to be consistent with the Joint C2 Architecture using agile development concepts and appropriate Joint Concept Technology
- Demonstrations (JCTD) implemented within the DoD enterprise
- Establish common enterprise information sharing services and transition these into virtual communities of interest





# What will TMF Provide?

- **Technology Outreach**

- TMF will provide an outreach capability to gather, aggregate, and organize the Technology Needs of Material Providers so they can be brokered with the Technology Development community
- TMF will provide an outreach capability to gather, aggregate, and organize projected Technology capabilities so they can be brokered with interested stakeholders

- **Technology Evaluation**

- TMF will produce independent technical evaluations, evidence, and TRL assessments of projected Technical capabilities
- TMF will provide the capability to store, organize, present, secure, and distribute technical evaluations and TRL assessments to authorized TMF stakeholders

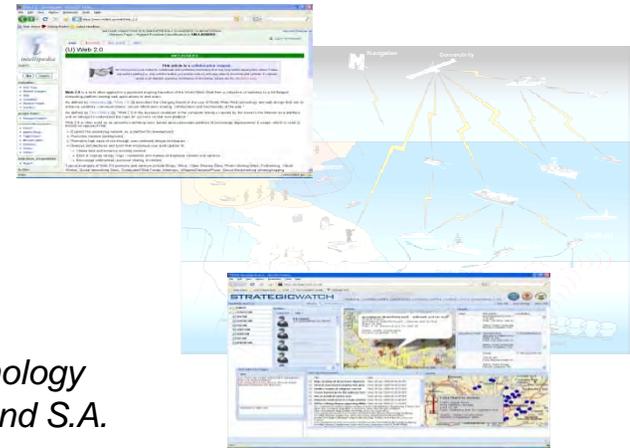
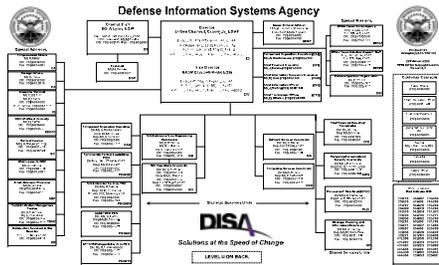
- **Technology Brokering**

- TMF will aggregate and broker Material Provider current technology needs with DISA's Enterprise licensing activities
- TMF will broker Material Provider future technology needs with current and new Innovation Initiatives

- **Technology Planning**

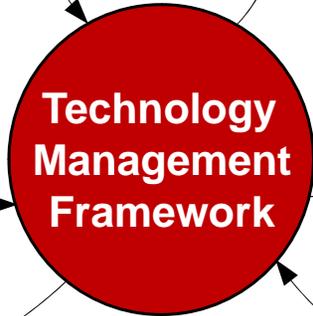
- TMF will provide a capability for organizing, integrating, and optimizing Technology Planning across relevant DISA organizations (CTO, PEOs, PMOs, and Directorates)
- TMF will provide Technology Situational Awareness to senior DISA leaders
- TMF will provide a capability for TMF stakeholders to collaborate on technology planning, investment coordination, technology maturation, and technology insertion/transition

# TMF Stakeholders



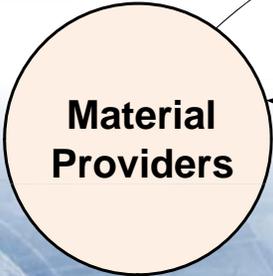
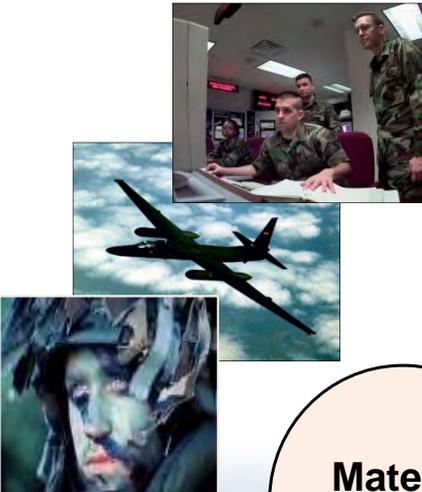
*Strategy & Guidance*

*Technology Plans and S.A.*



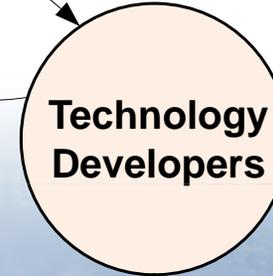
*Technology Needs & Plans*

*Technology Needs*



*Technology Recommendations*

*Technology Solutions*

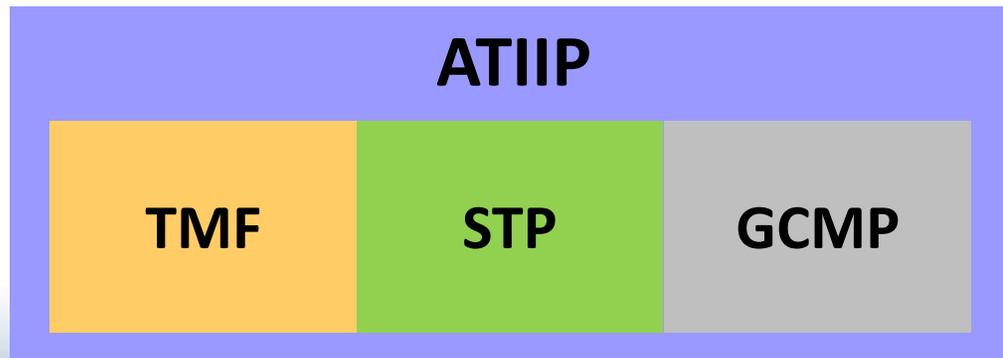




# DISA's Technology Life-Cycle

Advanced Technology Identification & Insertion Process (ATIIP)

- Technology Management Framework (TMF)
  - *Identify Technical Needs*
  - *Technology Alignment*
- Strategic Technology Plan (STP)
  - *Insertion Planning*
- GIG Convergence Master Plan (GCMP)
  - *Apply Technology and Best Practices*
  - *Govern [Assets, Improvement and Process]*





# GIG Convergence Master Plan

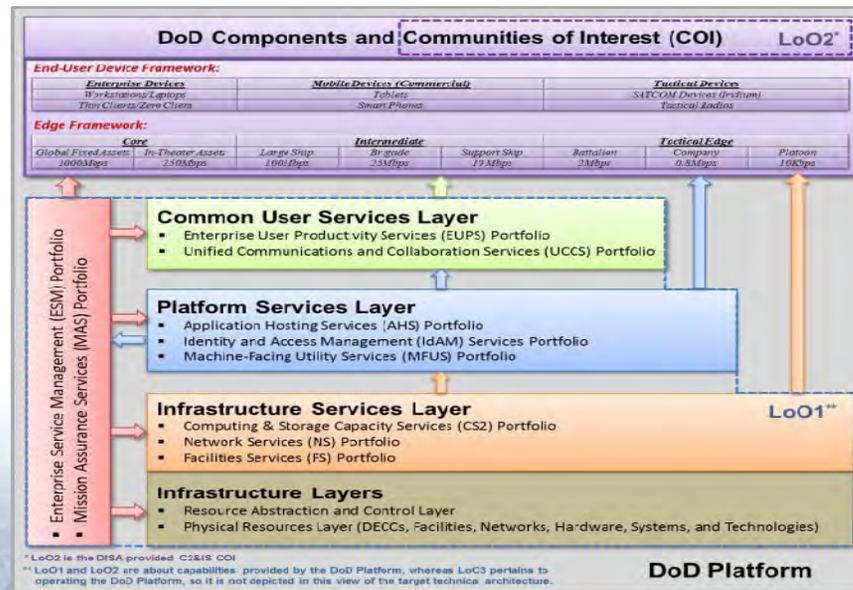


# GCMP 2012 Structure & Contents



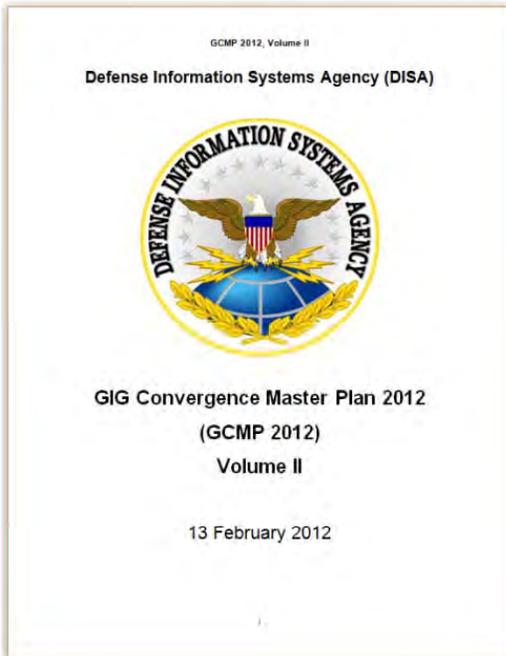
## Volume 1

- Technical Strategy
  - Objectives
  - Plan to achieve objectives
    - Portfolio Management
    - SE/MBSE & Service Design Processes
    - Standards and Technology Management
- Near term technical architecture



# GCMP 2012 Structure & Contents (cont)

## Volume 2



### DISA Technical Baseline

		Service Layer	Common User Services Layer										
		Service Portfolios & sub-portfolios	Enterprise User Productivity Services (EUPS) Portfolio										
		Service Offering Identifier	ST-201	ST-202	ST-203	ST-204	ST-205	ST-206	ST-207	ST-208	ST-209	ST-210	ST-211
		Service Offering	sdh/Enterprise Edge (EE) Service	sdh/Enterprise Field Service (EFS)	Enterprise Collaboration	Enterprise File Sync & Share	Enterprise Knowledge Capture (EKC)	Enterprise Directly Shared (EDS)	sdh/Enterprise Search Service (ESS)	sdh/Enterprise Content Application Service (EACS)	Enterprise Content Management Service (ECMS)	sdh/Enterprise Content Management Service (ECMS)	sdh/Enterprise User Storage Service
Capability Area	Capability Identifier	Capabilities, organized by DoD platform layers											
<b>Common User Capabilities</b>													
Other Productivity	CUS-OP-1	Instant Messaging	X										
	CUS-OP-2	Calendar	X										
	CUS-OP-3	Project Discovery				X							
	CUS-OP-4	Office Automation		X		X	X	X		X			
	CUS-OP-5	User Access		X	X	X	X	X					
	CUS-OP-6	User Personal File Storage											X
	CUS-OP-7	Document Libraries		X	X	X	X						
	CUS-OP-8	Team Collaboration (Rooms, Calendars, etc.)		X					X		X		
	CUS-OP-9	Business Process Management		X								X	X
	CUS-OP-10	Wiki		X									
	CUS-OP-11	Diags		X									
	CUS-OP-12	User Profiles		X		X	X						
	CUS-OP-13	Enterprise Resource Planning		X	X					X			
	CUS-OP-14	Application Storage & Delivery			X								

*Service Offering to Capabilities Mapping*

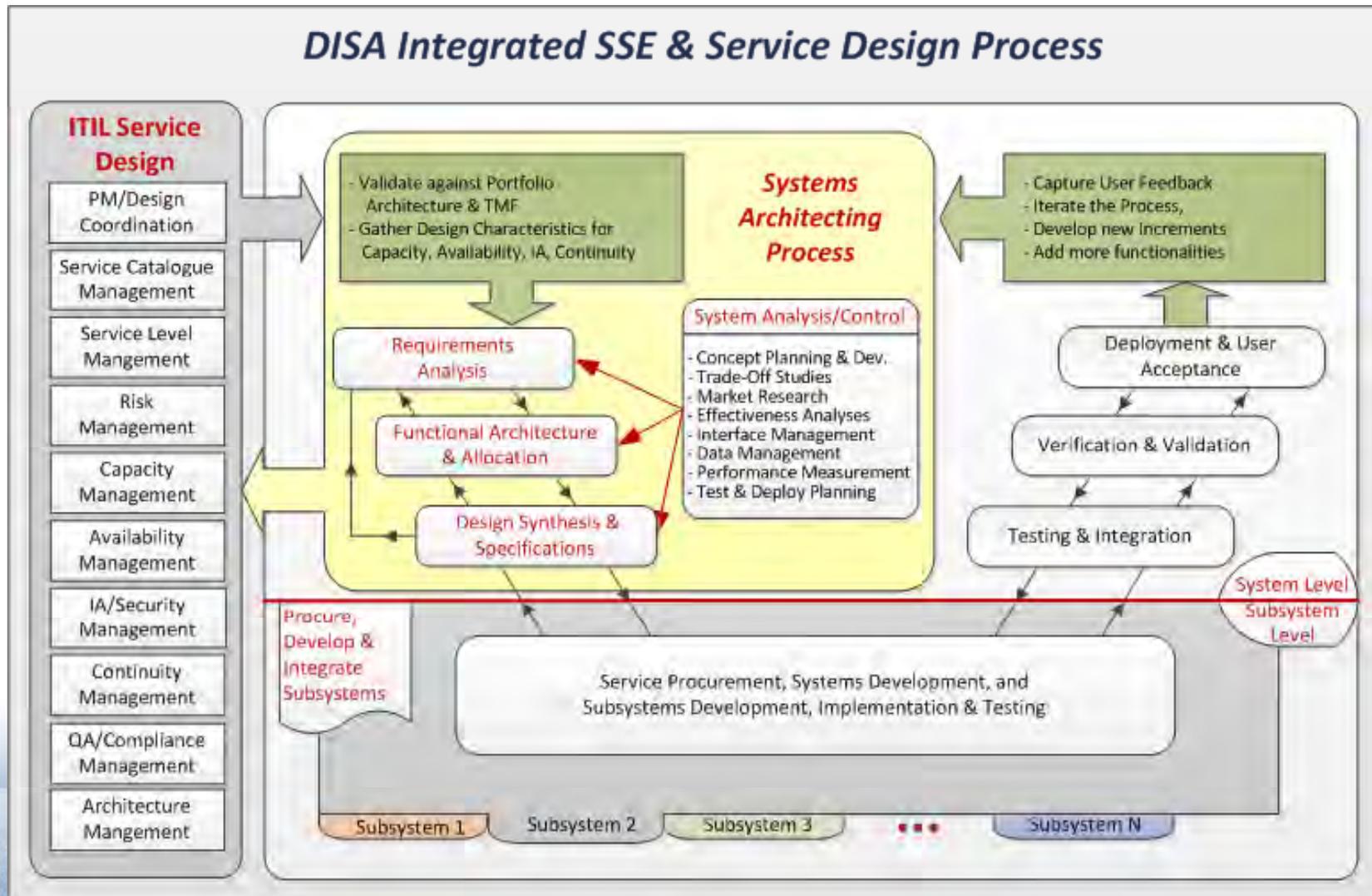
### Per-organization Service Offering List

URL	Service Offering	Summary
<b>Network Services (NS) Portfolio</b>		
Transport Services Sub-Portfolio		
<a href="#">S3220.1</a>	Ethernet Private Line (PL) Service	Provides a standard E-Line service as defined by the Metro Ethernet Forum (MEF) and provides dedicated point-to-point transport services from 1.5 Mbps to 10 Gbps over the DISN Core. The service uses SONET/Synchronous Digital Hierarchy (SONET/SDH) multiplexing to provide dedicated bandwidth from 1.5Mbps to 1Gbps service and 10Gbps (at OC-192 or 10GbE LAN PHY). Additionally, the service also uses Dense Wave Division Multiplexing (DWDM) to provide dedicated bandwidth for 10Gbps (10GigE WAN PHY) service.
<a href="#">S3220.2</a>	Ethernet Private LAN Service	Provides a standard E-LAN service as defined by the Metro Ethernet Forum (MEF). The service will provide multipoint-to-multipoint connectivity for multiple and geographically dispersed customer sites using a virtual connection and a common Ethernet broadcast domain that appears to be a virtual Local Area Network (i.e. a virtual LAN [VLAN]). The service will utilize the Class of Service (CoS) feature for priority information handling and bandwidth allocation and management over a shared DISN MPLS network. Emerging service.
<a href="#">S3220.3</a>	Alien Wavelength Service	Provides a dedicated end-to-end wavelength connection, designed for customers who use their own transceivers and desire a dedicated site-to-site optical connection with fewer restrictions on framing, bitrate, and formatting. Conceptual/emerging service.
<a href="#">S3220.4</a>	MPLS Labeled Transport Service	Provides a hierarchical VPN service (per IETF RFC 4364 Section 9; Carriers' Carriers) that allows DISN customers to interconnect their MPLS networks and offer MPLS services over the DISN MPLS backbone, eliminating the need for customers to build their own MPLS backbone. Conceptual/emerging service.
<b>Dedicated Services</b>		
<a href="#">S3211.1</a>	DISN ATM Service (DATMS)	Provides cell-based, point-to-point, and point-to-multipoint connectivity to DISN customers. DATMS offers Permanent Virtual Circuit (PVC) and Permanent Virtual Path (PVP) services. Capped Service.

### Appendices: GTG Reference, CP/GCMP Mapping

# GCMP 2012 Plan to Achieve Objectives

## Systems Engineering & ITIL Service Design Process

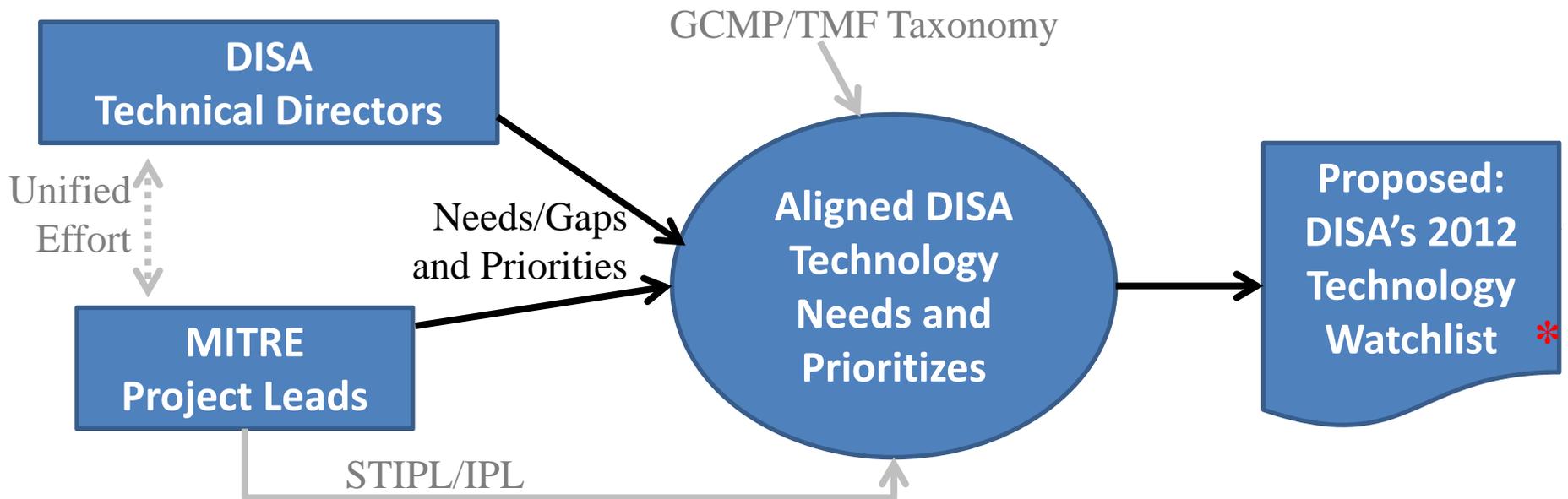




# Technology Watchlist & GAPS



# Watchlist Collection Process



\* New 2012 DISA Technology Watchlist is aligned with the GCMP/TMP Taxonomy

STIPL = Science and Technology Integrated Priority List

IPL = Integrated Priority List

Watchlist contains DISA's priorities that align with COCOM priorities.



# Proposed DISA Top Technology Gaps

- **DoD Enterprise Wide Identity and Access Management**
  - Enterprise Directory, Credentials, Authentication Services, Attribute-Based Access Control
- **Secure Mobile Devices and Management Capabilities**
  - Secure Mobile Devices, Mobile Application Stores, Mobile Device Management
- **Enterprise Cross Domain Solutions**
  - Guards, Multi-level Security, Policy-based Information Sharing
- **Enterprise Data Cloud**
  - Data Provisioning, Intelligent Caching, Data Sync, Data Federation
- **Optical Transport Network**
  - Optical Network Elements, Optical Fiber Links
- **Disruption Tolerant Networking**
  - Fault Tolerant, Graceful Degradation, Rapid Recovery



# Proposed 2012 Technology Watchlist

Watchlist Item	Technology Area
Cloud Computing	Software Cloud Technologies
	Platform Cloud Technologies
	Infrastructure Cloud Technologies
	Data Cloud Technologies
	Transport Cloud Technologies
Cross Domain	Coalition idAM
	Cross Domain Services
Data Services	Data Mining
	Data Fusion
Disruption Tolerant Networks	Service Delivery Optimization
Enterprise Service Management	Network Protection
	Cyber Situation Understanding
	Cyber Command and Control
	Cyber Behavior Monitoring
	Enterprise Service Management
Identity and Access Control	Credentials Identities
	Authentication
	Authorization
	Guards
	Multi-Level Security
	DMZ Technology
	Assured Information Transfer

Watchlist Item	Technology Area
Mobile Technology	Smart Phone Devices
	Slate Tablet Devices
	Mobile Applications
	Application Hosting
	Mobile Device Management <sup>+</sup>
Optical Networks	IP Quality of Service
Satellite Communications	Fixed Satellite Service
	Mobile Satellite Service
Secure Networks	VPN
SOA Technology	Service Provisioning
	Service Cataloging
Spectrum Management	Spectrum Management
Widget Technology	Widgets
	Widget Framework



# Initial MITRE COCOM Need Analysis

Operational Need	COCOM Need	Technology Gap	DISA Focus
Real time analysis of Social Media	Yes	Open Source ingestion, sorting and analysis	<ul style="list-style-type: none"> <li>• Information Volume &amp; Velocity (IV2)JCTD</li> <li>• Unclassified Information Sharing (UIS)</li> <li>• All Partners Access Network (APAN)</li> </ul>
Small Combat Unit C2	Yes	Ability to communicate/ collaborate in adverse environments	<ul style="list-style-type: none"> <li>• Multi Level Security (Handheld)</li> </ul>
Human Interface	Yes	Ability for end users to manipulate and understand evolving information	<ul style="list-style-type: none"> <li>• Strategic Watch</li> </ul>
Enterprise C2	Yes	COCOM ability to manage AOR	<ul style="list-style-type: none"> <li>• EOS</li> <li>• ASF</li> </ul>
Multi-national C2	Yes	Ability to share information with partner nations	<ul style="list-style-type: none"> <li>• MNIS</li> </ul>
Mission Assurance	Yes	Secure, agile and effective communications	<ul style="list-style-type: none"> <li>• Attribute Based Access Control (ABAC)</li> <li>• Mission Assurance Decision Support System (MADSS)</li> </ul>
Infrastructure	Yes	Gaps in Existing infrastructure	Integrated Satellite Communications-Global Information Grid Operations Management (ISOM) - FY10 Start
Shipment tracking	Yes	Ability to track shipments across various shipping options	<ul style="list-style-type: none"> <li>• TBD</li> </ul>



# How to Participate?



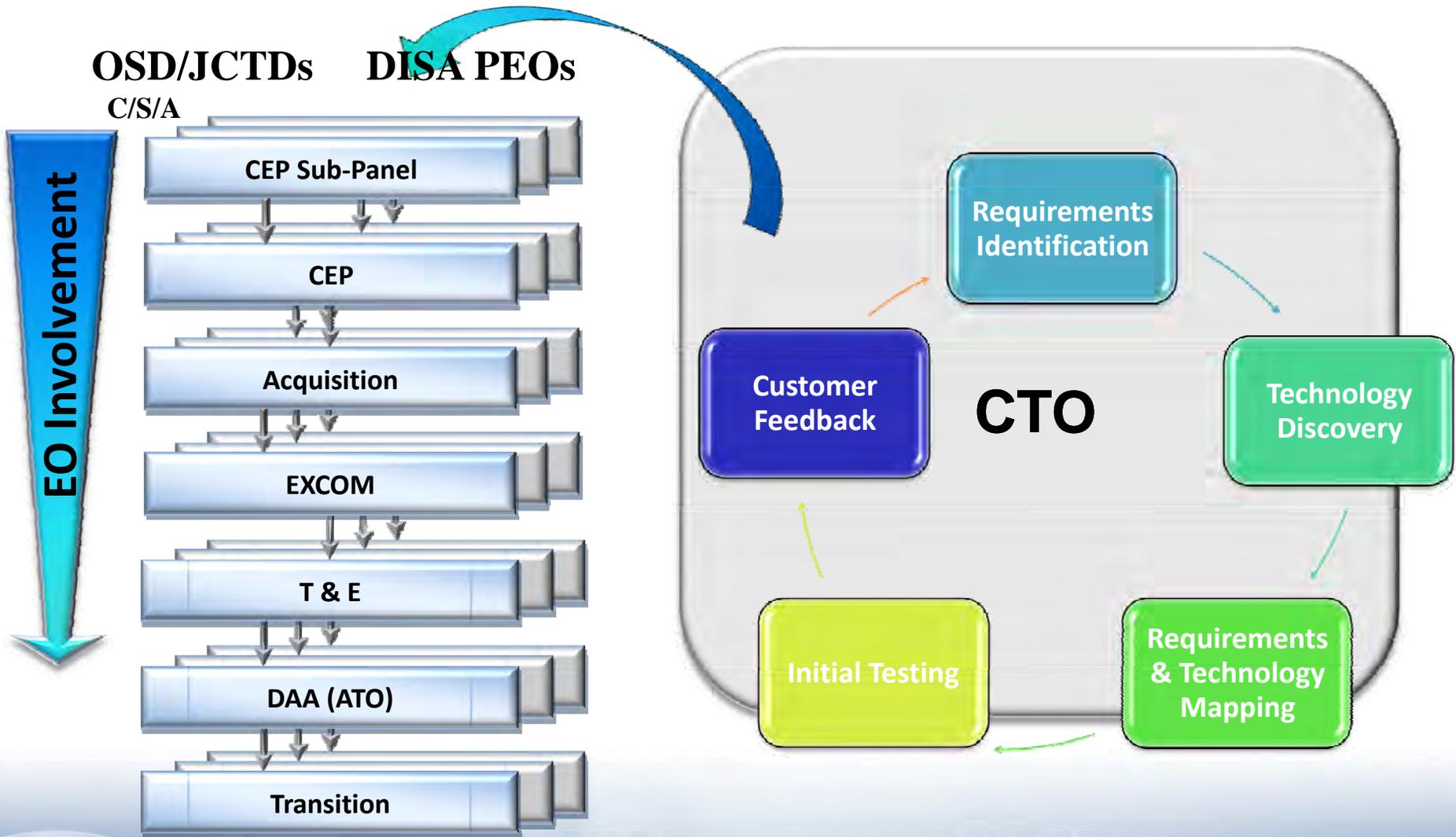


# Emerging Technology Process (JCTDs & CWP)

- Address COCOM needs with innovative concept and mature technology
- Provide capability solution with operational concepts and tactics, techniques & procedures
- Assess solutions in Warfighter Operational Demonstrations
- Usually joint, often combined / coalition / interagency / transformational
- Rapid Results: 1 to 3 years or less to final demonstration and a prototype interim capability
- Multiple funding sources with a Transition Agreement

**Emphasis on Demonstration and Transition...try with intent to buy**

# Transition Roadmap

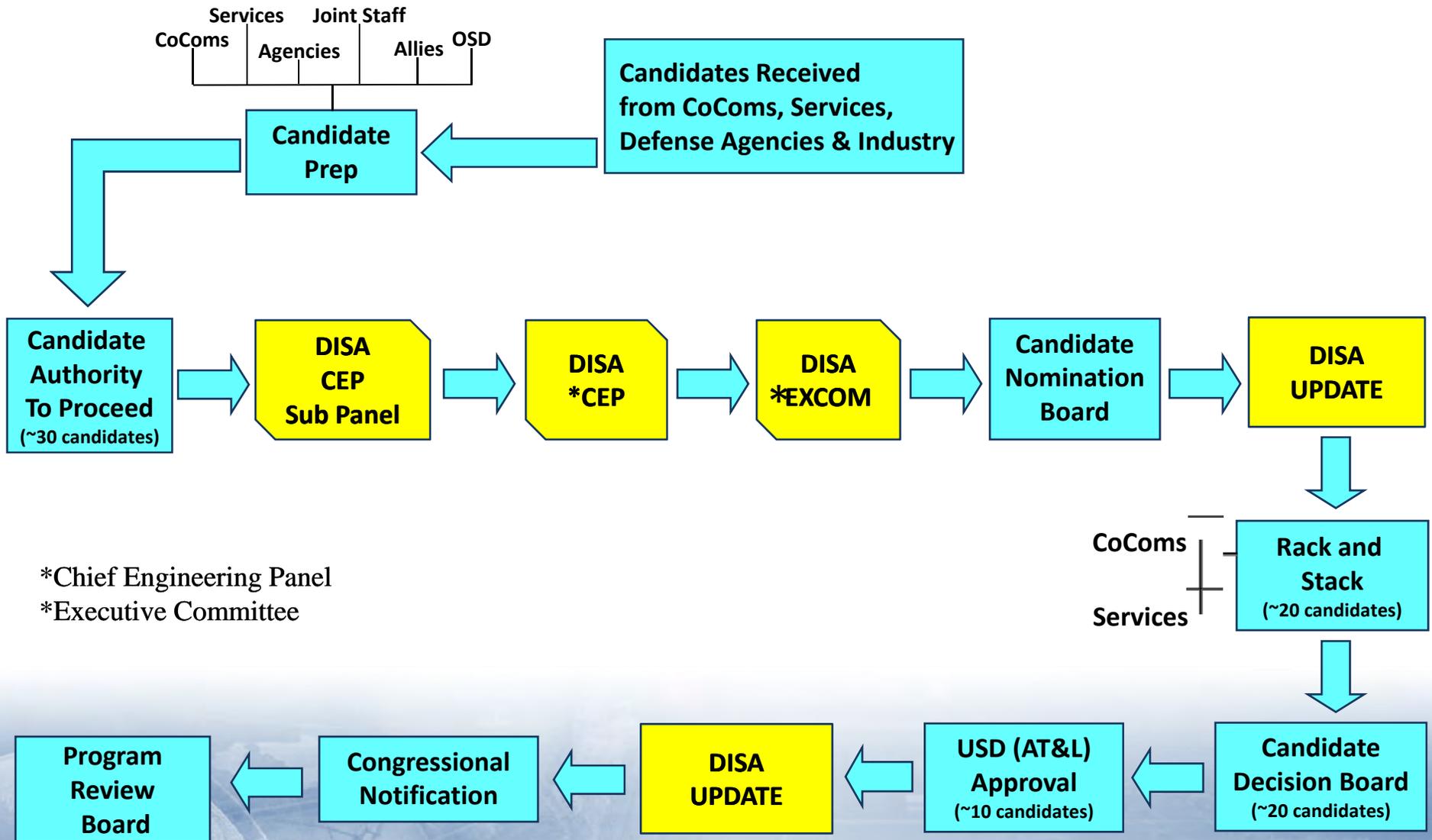


*"We must engage in a continual dialogue with key partners and technology-development leaders to be in the forefront of emerging technology and to be in position to influence its environment."*

- DISA Campaign Plan 2011 - 2012

# Emerging Technology Approval Process

Identification, Selection & Approval





# What is a CRADA?

- DoD / Commercial Partnership opportunity
  - CRADAs are "collaborative" efforts
  - Allow sharing/exchange of personnel, services, facilities, intellectual property, and equipment with or without reimbursement
  - Help facilitate the timely transfer of technology
  - Flexible and powerful vehicle for sharing information
  - Can usually be established quickly
  - **but not funds to the non-Federal parties**
- A means, mechanism, and authority given to Federal agencies and labs to implement the Stevenson-Wydler Act T2 mandate.





# Innovation Initiatives





# Ongoing Technology Initiatives

- Cloud
  - Reconciled objectives of Cloud and Data Center working groups to establish DoD CIO Cloud Computing Working Group -- working group to align cloud efforts throughout the Department
    - Developed reference architecture for cloud computing
    - Develop legacy migration strategy
    - Participating in standard development organizations
- Identify & Access Control
  - Developing holistic Enterprise Architecture
    - Performing Proof-of-Concept
- Mobile
  - Established DISA program office
  - Established DoD Mobility Group Forum
  - Mobile Application Store Pilot ongoing
- Widget Frameworks
  - Working to leverage StrategicWatch visualization libraries in OWF



# Summary

- We need to maintain our technological edge
- We need your HELP in solving immediate DoD technology gaps
- We want to partner with you through CRADA's, enabling technology initiatives, and JCTD's
- TMF link <https://tmf.csd.disa.mil/>



# Contacts

- Technology Management Framework
  - Ruth Shearer, [ruth.shearer@disa.mil](mailto:ruth.shearer@disa.mil)
- GIG Convergence Master Plan
  - Chris Gedo, [chris.gedo@disa.mil](mailto:chris.gedo@disa.mil)
- DISA JCTD Program
  - Charlie Fields, [charlie.fields@disa.mil](mailto:charlie.fields@disa.mil)
- CRADA's
  - Theresa Jackson, [theresa.jackson@disa.mil](mailto:theresa.jackson@disa.mil)





# Backups





# DISA CRADA Projects

CRADA Partner	Sponsoring Organization	Description
Hughes, LLC	NSE	Characterize network-centric enterprise architecture based applications at physical, data link and network layers, and to study associated network management operations for IP networking with the Regenerative Satellite Mesh-A (RSM-A) standard to determine the ability of RSM-A to satisfy DoD Network-Centric SATCOM requirements.
Boeing Consortium	NSE	Research & develop, enterprise architecture concepts, and best practice methodologies to the Senior Leadership Command, Control, and Communications System (SLC3S) Overarching Integrated Architecture (SOIA) from an enterprise and operational viewpoint.
OSCMIS	MPS	Collaborative effort between government, industry, academia, R&D organizations and the open source community to use a joint open source and commercial licensing process to encourage research enhancements and adaptations of government-owned technologies and thereby support new net-centric products for use by DISA and other federal agencies.
Segovia/Inmarsat	NSE	Collaborative effort to develop information, documentation, and analysis on technologies and methodologies for designing, building, operating and maintaining satellite and/or terrestrial networks.



# 2012 Proposed DISA Watchlist aligned with TMF/GCMP Technical Taxonomy

## End User Device Technologies

- Mobile Devices
  - Smart Phone Devices
  - Slate/Tablets
- End-User Software
  - Unique visualizations
    - *Deep analysis/Understand evolving information*
  - Video Technologies
    - *Full Motion video*

## Platform Technologies

- Cloud
  - Multiple aspect (Software, Platform, Infrastructure, Data, Transport)

## Infrastructure Technologies

- Networking
  - Self Configuring Networks
  - Optical Transport
- Wireless
  - Integrated Satellite

## Mission Assurance Technologies

- Identify and Access Control
  - Credentials/Identities
  - Authentication
  - Authorization
- Cross Domain
  - Guards
  - Multi-Level Security
  - DMZ Technologies
  - Assured Information Transfer
  - Authorization
- Active Defense
  - Intrusion Detection and Response
  - Mission Assurance Decision Support System

## Service Management Technologies

- Systems Management
  - Enterprise Service Management
- Infrastructure Management
  - IA Infrastructure Management
    - *Host Based Security*

# 2012 Proposed DISA Watchlist aligned with TMF/GCMP Technical Taxonomy (cont.)

## C2IS Community of Interest

- Situation Awareness
  - Tracking Database Synchronization
    - *Shipment Tracking*
- Intelligence
  - Analysis and Production
    - *Real-time Analysis of Social Media*
- Coalition
  - Coalition IdAM
  - Multi-National C2
  - Enterprise Cross Domain Technologies
- Data Management
  - Data Analysis
  - Big Data
- Knowledge Management
  - Semantic Web Technology
- Data Services
  - SOA Technologies
    - *Data Services (Storage, Caching, Mirroring [Content Delivery], Staging, Aggregation, Metadata)*
- Support
  - Data Mining
    - *Real-time analysis of Social Media*
    - *Large Data Set Analysis*
- Management
  - Operational Management
    - *Global Information Grid Operations Management (ISOM)*





# QUESTIONS

