



Acquisition Directorate

Research & Development Center

Maritime Domain Awareness Data Sharing

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Presentation to USCG MDA Day
29 October 2007



Topics

Data Sharing Overview

Spiral 1 and 2 Update

Spiral 3 Planning

Discussion



Current Environment

Crises create unanticipated data needs...

Look to recent events:

- 2000 Terrorist Attack on USS Cole in Yemen
- 9/11/2001 Terrorist Attack in USA
- 2004 Tsunami in Southeast Asia
- 2005: Hurricane Katrina Devastation in USA

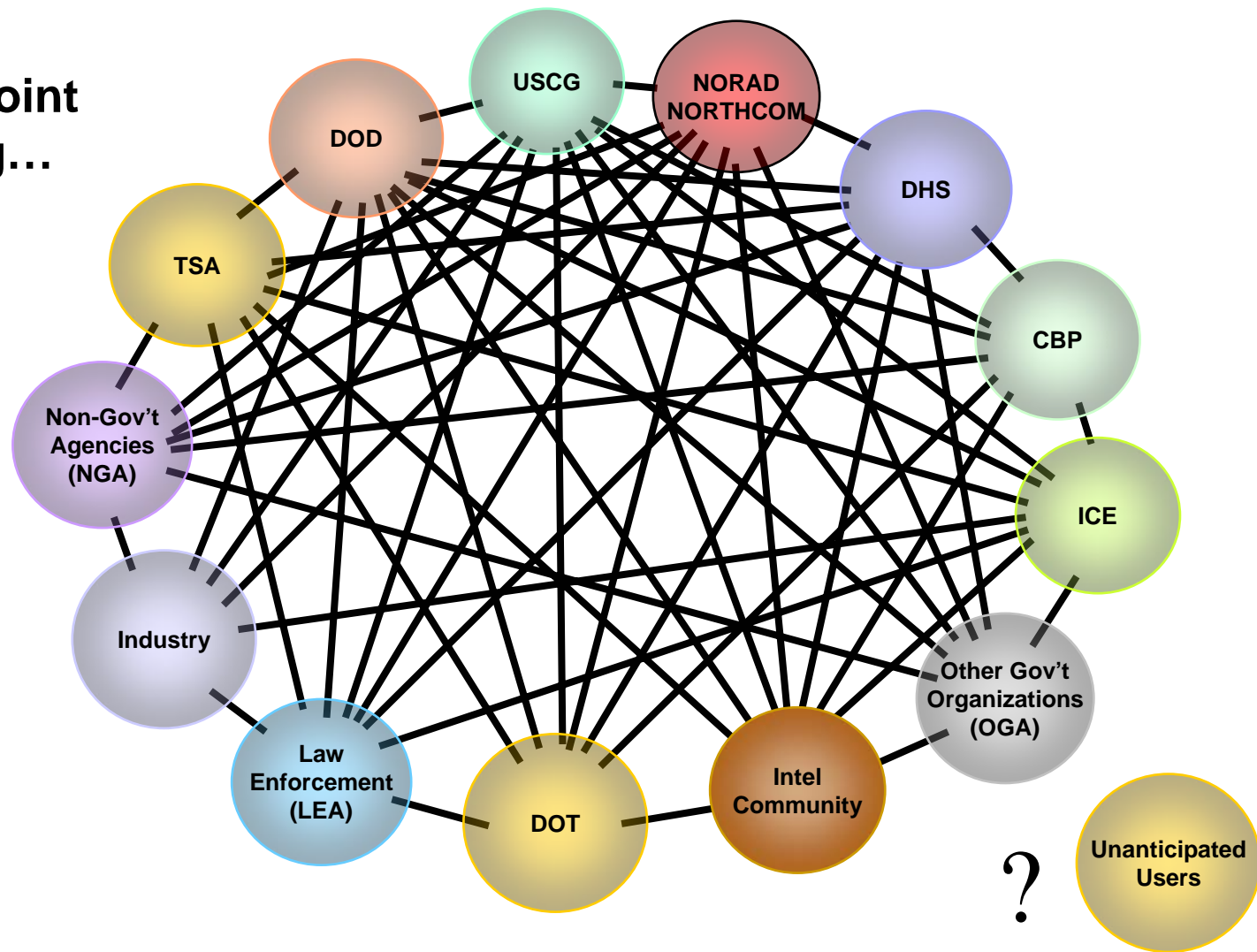
Intergovernmental Federal Cooperation is essential

Current infrastructure is not responsive...



The Current Paradigm

...point-to-point
data sharing...



Purpose

Wanted – Net-centric data sharing for the maritime community

Benefits :

Scalable and adaptable to the community

Flexible and agile decision-making and execution

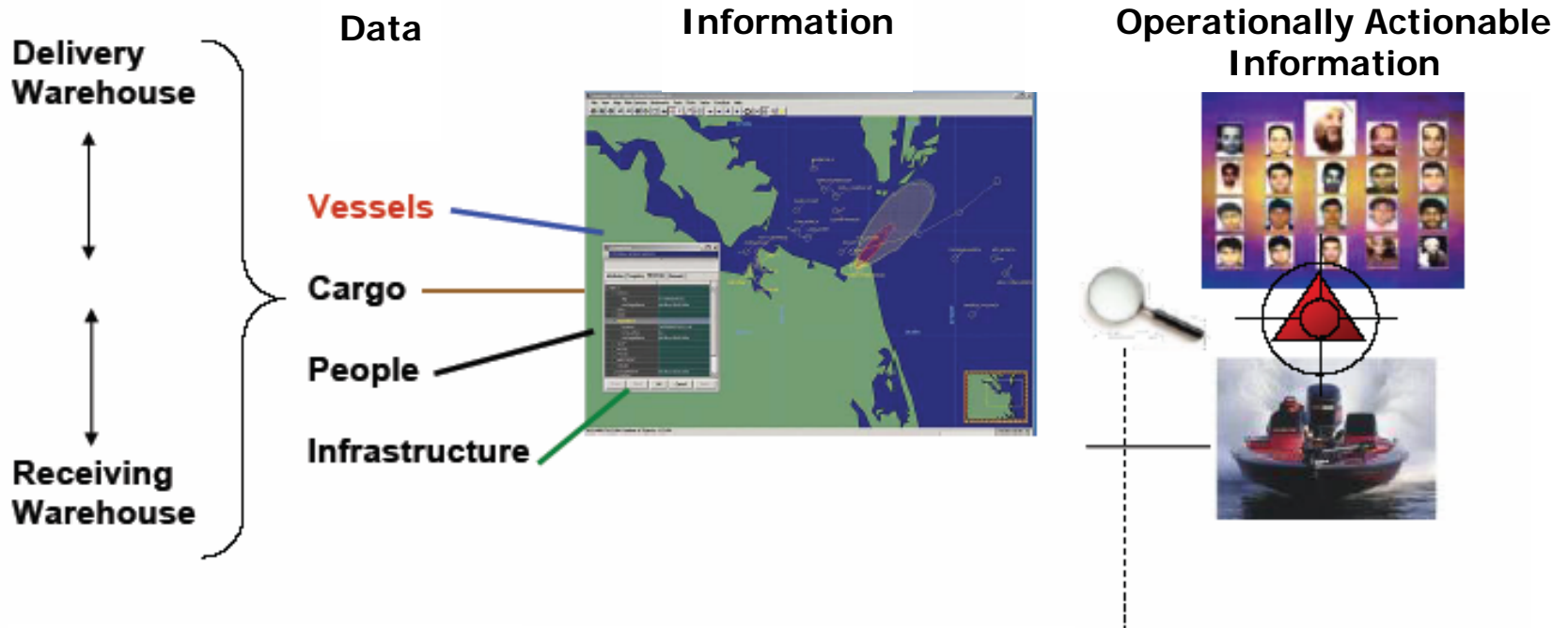
Efficient in cost, schedule, and performance

Improves community partnerships across boundaries



Maritime Fusion Challenge

Current Tasking: Corresponds with MDA Essential Tasks: Find, ID, track



Gather data from disparate sources:

- Commercial
- Law Enforcement
- Foreign Partners
- Military

Develop Maritime Situational Awareness

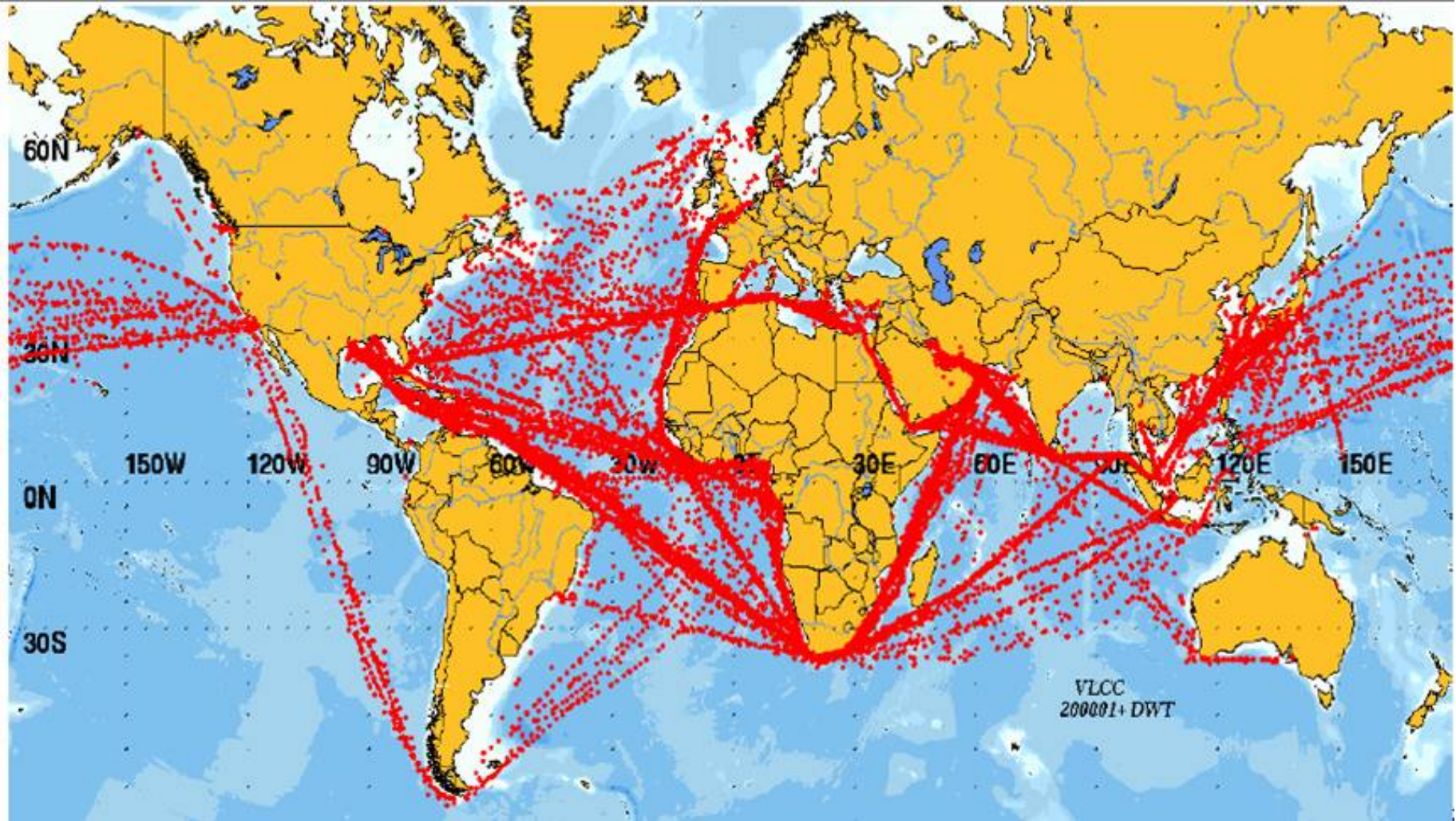
- Reconcile data sensitivities
- Fuse data into information
- Display for info for human understanding (User-Defined Operational Picture - UDOP)

Establish Maritime Situational Awareness:

- Understand the "normal" situation
- Recognize the anomalies
- Direct the operational actions

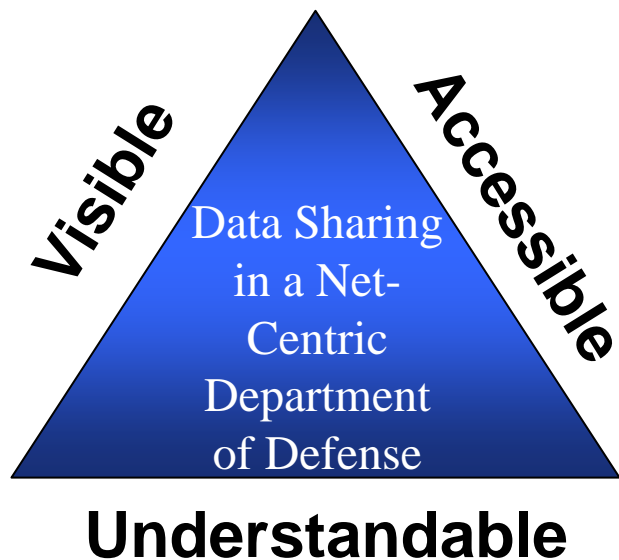


Global Maritime Situational Awareness



Communities of Interest

A collaborative group of people that must exchange information in pursuit of its shared goals, interests, missions, or business processes and therefore must have a shared vocabulary for the information it exchanges ... DOD Directive 8320.2



Services-Oriented Architecture (SOA)

Net-Centric Enterprise Services (NCES)

- Developed by Defense Information Services Agency (DISA)
- SOA for Department of Defense agencies & users
- Allowances made for non-DoD agencies & users

Homeland Security Information Network (HSIN)

- Developed by Department of Homeland Security
- Portal for non-DoD agencies & users

Coalition Warrior Interoperability Demonstration (CWID) and Trident Warrior (TW)



Spiral 1 & 2 Overview

Spiral 1

- **Kickoff 22-23 February 2006**
- **Unclassified AIS Net-centricity (MDA \$300K, CG-66 \$600K)**
 - 4 Publishers in DoD, DHS, DOT
 - 4 Subscribers (UDOP) from DoD, DHS, DOT
- **NCES, HSIN Infrastructures Leveraged**
- **DoD CIO Demo at ONI – 17 Oct 2006**
- **N6 Demo Pentagon – 14 Dec 2006: CG-01 Participation**

Spiral 2

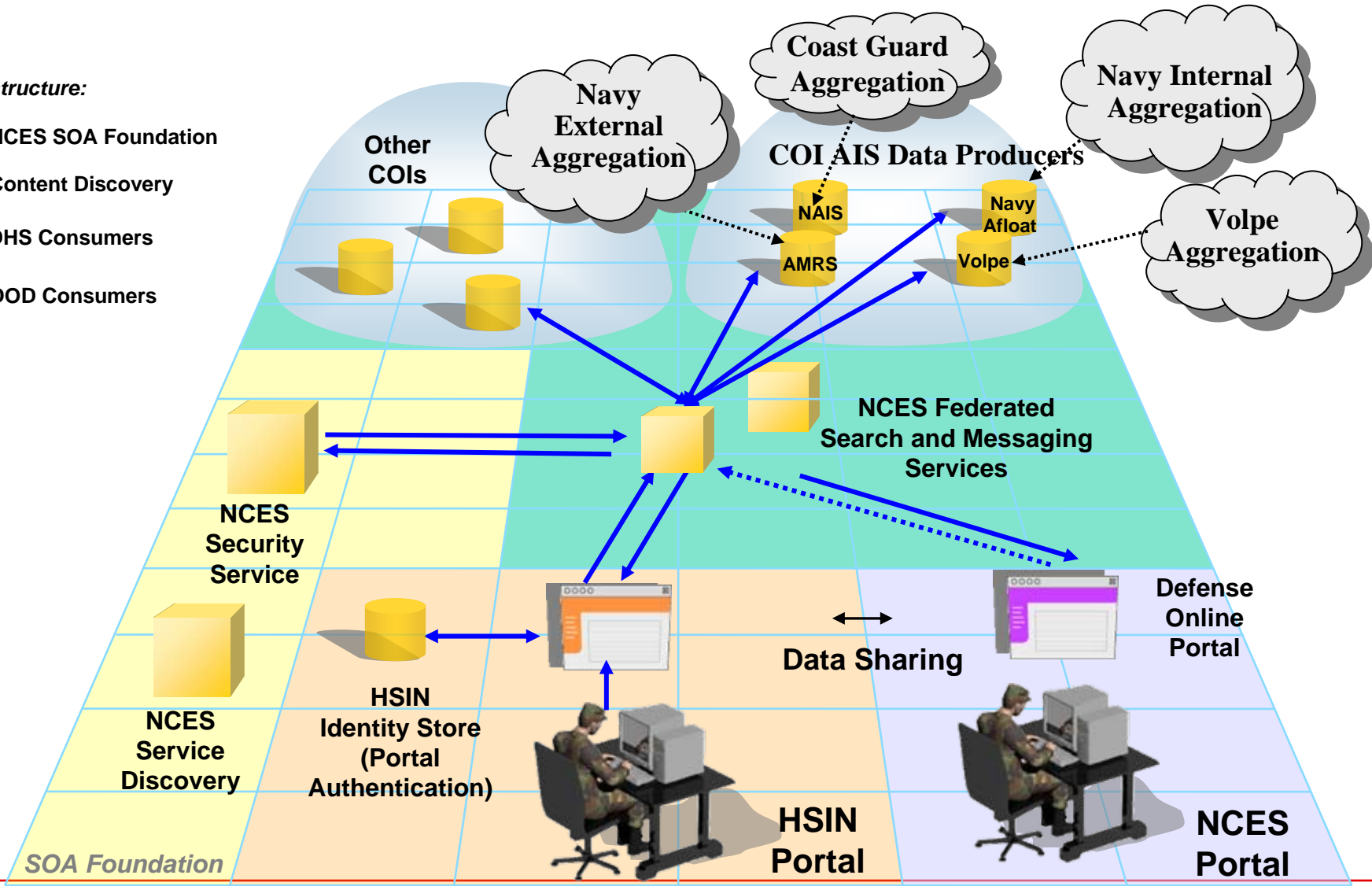
- **Funded by USN N6 & USCG NAIS Program**
- **Adds Capability Enhancements & Data Services**
 - Enhance Security, Low-bandwidth users, High-Data Publishers, New publishers & data types (e.g., METOC, Imagery)
 - Historical Archiving, Anomaly Detection, Data Augmentation



High-Level Pilot Architecture

Infrastructure:

- NCES SOA Foundation
- Content Discovery
- DHS Consumers
- DOD Consumers



SOA Foundation

DHS

DOD

Legacy Viewer (iMap Data)

Maritime Domain Awareness Data Sharing COI - Microsoft Internet Explorer

Address: <https://beta.imapdata.com/ims/DefaultView.aspx>

Maritime Domain Awareness Data Sharing COI

Tools: Help What's New

- Demographics
- Detection Systems
- Education
- Electric Power
- Emergency Management
- Federal Lands
- Fuels
- Geography
- Government
- Imagery
- Impact Analysis
- Law Enforcement
- Media
- Military
- Natural Gas
- Natural Hazards
- Nautical Charts
- Nuclear
- Oil
- Petroleum Infrastructure
- Political
- Ports
- New York City, NY
- Postal/Shipping
- Religion
- Telecommunications
- Transportation
- Water
- Weather
- Bookmarks

conveyance : Name: GUY_V_MOLINARI-MMSI: 366952790-IMO Number: 0-Speed Over Ground: 14.7-Course Over Gro

Name: GUY_V_MOLINARI
MMSI: 366952790
IMO Number: 0
Speed Over Ground: 14.7
Course Over Ground: 226
Destination: WHITEHALL TERMINAL
E.T.A.: Oct 13 2006 12:00AM
Latitude: 40.6914 Longitude: -74.0269

1 : 35,236 3.91 x 4.17 (mi)

start 2 Internet Ex... Situational Awa... GES Portal - NC... AIM Microsoft Of... Gulf Coast.bmp... My Pictures 1:35 PM

COI Collaboration site

Home - Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI) - Microsoft Internet Explorer provided by Unit

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Print Preview Home Folder Favorites

U.S. COAST GUARD Type in a keyword Search Highlight Zip Code: ELEVATED Tools Address

Home Documents and Lists Create Site Settings Help Tutorials MySite Up to GES Portal

Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI)

Home

Documents
 Shared Documents
Pictures
 Image Library
Lists
 Announcements
 Links
 Contacts
 Events
 Tasks

Discussions
 General Discussion

Surveys

The MDA DS COI is an initiative focused on the establishment of an MDA information-sharing capability employing net-centric applications and services among the full spectrum of MDA stakeholders. This includes the creation of a MDA community defined data standard to support net-centric information sharing by making the MDA data visible, accessible, and understandable. The MDA DS COI is governed by and composed of an Executive Board, Steering Committee, and several working groups.

The MDA DS COI recently delivered its Spiral 1 Pilot capability, which demonstrated a global UNCLAS MDA Data Sharing net-centric capability based initially on multiple Automatic Identification System (AIS) data producers adopting a common (MDA Community) vocabulary and schema. The MDA DS COI Pilot Spiral 1 capability utilized the DHS Homeland Security Information Network (HSIN) and the DOD Net-Centric Enterprise Services (NCES) Early Capability Baseline (ECB) to offer Data Producers and Consumers a single/common seamless methodology for exposing, discovering, publishing and subscribing to UNCLAS MDA data.

The MDA DS COI has begun the planning phases for its Spiral 2 Pilot capability, which will involve maintaining the existing Data Producers and Consumers, integrating additional Data Producers and Consumers, and creating value-added services on top of the existing information-sharing capability that leverage AIS data to provide enhanced functionality for MDA stakeholders.

Announcements

There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

- Add new announcement

Shared Documents

Type	Name	Modified By
	MDA DS COI NCES Lessons Learned (1500-8MAR07) (2)	Adam White
	MDA Overview (1500-19DEC06)	Richard Baker
	Related National MDA Documents	Adam White
	DoD Directives	Adam White
	NCES Information	Richard Baker
	MDA DS COI Spiral 2	Richard Baker
	MDA DS COI Spiral 1	Richard Baker
	MDA Training	Adam White

- Add new document

Contacts

Last Name	First Name	Business Phone	E-mail Address
Baker	Rich	703-526-0001	rich.baker@solers.com
Bojanowski	Beth	619-297-2905	bbojanow@fgm.com
Gants	Bob	703-526-0001	Robert.Gants@solers.com
MDA DS COI Technical Support Team (TST)			
Raney	Christopher	(619)-553-5282	raneyc@spawar.navy.mil
Riddlehoyer	Trev	703-526-0001	trev.riddlehoyer@solers.com

Events

There are currently no upcoming events. To add a new event, click "Add new event" below.

- Add new event

Tasks

Title Assigned To

There are no items to show in this view of the "Tasks" list. To create a new item, click "Add new item" below.

- Add new item

Links

- Net-Centric Enterprise Services (NCES) Homepage
- DoD Metadata Registry and Clearinghouse
- Community of Interest (COI) Toolkit
- Community of Interest (COI) Directory
- Net-Centric Enterprise Services (NCES) User Workspace



Trusted sites



Site for Developers & Users

Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI) - Microsoft Internet Explorer provided by United Stat

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Tools

U.S. COAST GUARD Type in a keyword Search Highlight Zip Code: ELEVATED Tools Address

Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI)

[Click HERE to view MDA Data with Google Maps](#)

Welcome to the MDA DS COI information page. This webpage provides direct links to view the MDA DS COI Spiral 1 messages containing Automatic Identification System (AIS) data within both Google Maps and Google Earth. The Google Maps and Google Earth implementations represent a mediation of the MDA DS COI messages, which are consumed from the Net-Centric Enterprise Services (NCES) Early Capability Baseline (ECB) Messaging Services, to the Keyhole Markup Language (KML) format supported by both Google Maps and Google Earth. The KML formatted data is then displayed in the Google Maps tool and the Google Earth client.

We have defined six (6) data channels for Spiral 1. Five (5) of the data channels are split into geographical boundaries around the continental US and Mediterranean. In addition, we've defined an "Other Area of Interest" channel that captures any area outside of the five (5) US and Mediterranean boundaries. We also have a special channel for the AMRS data feed due to sharing restrictions of the data outside of the Department of Defense.

MDA DS COI

Navy Enterprise USCC OSC Yeps COI AMRS

A B C D E F G

NCES Messaging Service

Subscription Request Messages Received (in COI Vocab) Subscription Request Messages Received (in COI Vocab)

UDOP Mediation Service UDOP



USCG NAIS

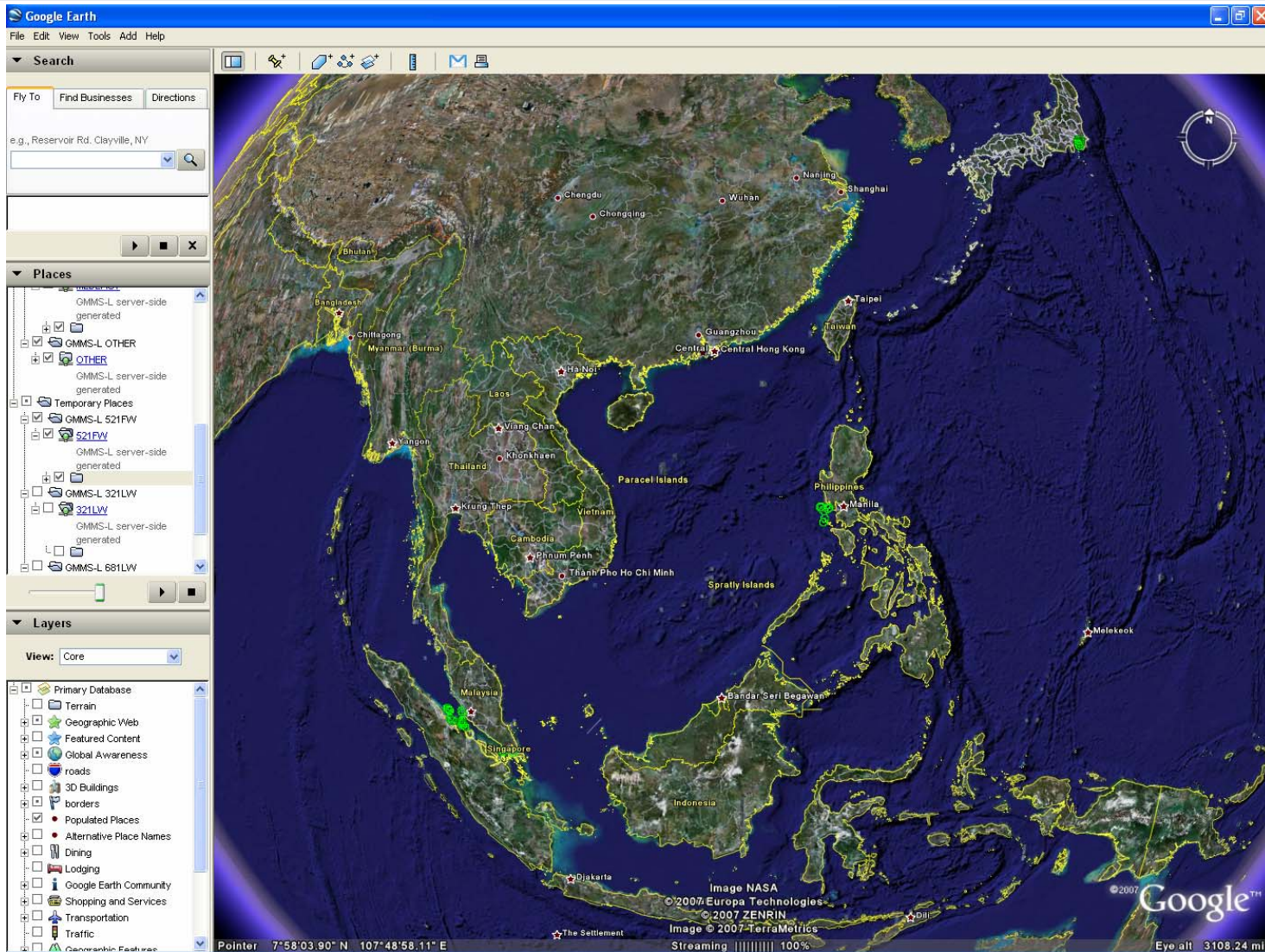
The screenshot displays the Google Earth interface with a map of the United States and surrounding regions. Numerous green circular markers are scattered across the map, representing USCG NAIS data points. A detailed information window is open over the map, providing the following data for the vessel SOUTHERN CROSS:

SOUTHERN CROSS	
Name:	SOUTHERN CROSS
Latitude:	33.334
Longitude:	-77.402
Data Source:	NAIS
Time Stamp:	2007-10-19 14:06:27.0
Destination:	CHARLESTON
Estimated Time Of Arrival:	2007-11-20 08:00:59.0
IMO Number:	9197014
MMSI Number:	247128700
Speed:	10.600
Draught:	5.400
Heading:	230.000

The interface includes a search bar, a 'Places' list on the left, and a 'Layers' panel at the bottom left. The status bar at the bottom shows the current coordinates (17°02'13.85" N 119°11'10.06" W), streaming status (100%), and eye altitude (3606.18 mi).



NAVY & AMRS



MSSIS – Volpe

The screenshot shows the Google Earth interface with a map of the Mediterranean Sea and surrounding regions. A data popup window is open over the location of 'CAPTAIN BASHAR'. The popup contains the following information:

- Name: CAPTAIN BASHAR
- Latitude: 37.035
- Longitude: 21.171
- Data Source: VOLPE
- Time Stamp: 2007-10-19 14:48:56.0
- Destination: null
- Estimated Time Of Arrival: null
- IMO Number: 7361520
- MMSI Number: 353526000
- Speed: 10.500
- Draught: -32768.000
- Heading: 313.000

The map shows various countries including Italy, Bulgaria, Turkey, Syria, Israel, Jordan, Egypt, and Libya. Major cities like Beograd, Ankara, and Gaziantep are labeled. The popup window also shows a small map of the world with a red dot indicating the location of the vessel in the Mediterranean Sea.



Coalition Warrior Interoperability Demonstration 07



NORTHCOM HQ

CWID FBL Net

NSWC Dahlgren, VA

FalconView

NATO

CWID FBL Net

New Zealand

NCES/SIL (MDA DS COI)
 Subscribe/Publish
 AIS info Worldwide &
 Publish SeaHawk Products

South Carolina

Subscription
to NCES

Publication
to NCES

HSIN

**SeaHawk
Charleston SC**

HSIN



500' Cape Chalmers

Seahawk 900 MHZ Wireless LAN
 "Reach-back" Network
 video/voice/data

Biometrics
 - Onboard Boarding Team
 - capture of photos & fingerprints
 - compare w/ US-VISIT

Boarding Team Comms
 - Below decks network
 - voice
 - video
 - data

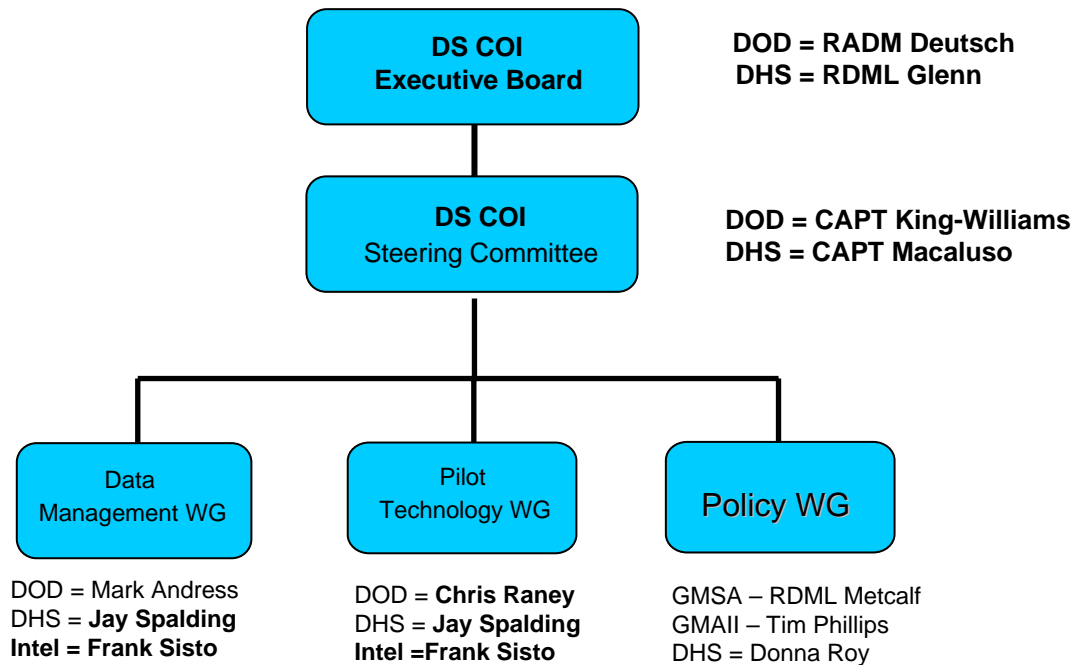
FalconView & Back-End data connection to/from Seahawk system

CWID 2007 – 12-22 JUN 07
 - Exercise actual boarding team C2 processes and information exchanges

HSIN
 COI
 SeaHawk
 CWID (Internat'l)

Spiral 2 & 3 Governance

Spirals 2&3



Spiral 3 Recommendation

Advance Notice of Arrival (ANOA) – CG-26

Single Integrated Look Out List (SILO) – ONI

ANOA – Sensitive Data Challenge – Develop Policy and Attribute-Based Access Control (ABAC) to enable Need-to-Share

SILO – Policy Challenge – Aggregation of Lists; Security Challenges (GENSER, SIPRNet)

Broadens & Augments Scope of Data Sharing; Beyond AIS

Catalyst Events – Trigger Higher-Level Data Services

Complement Efforts of Other Organizations (CBP, ICE)



Spiral 3 Recommendation

At Spiral 3 Kick-Off meeting, DS COI recommended Advanced Notice of Arrival (ANOA) and Single Integrated LookOut (SILO) List be made Net-Centric on NCES.

ANOA

Federal Regulation that ALL Vessels inbound or departing from the U.S. file a Notice of Arrival at least 96 Hours in advance

ANOA contains vessel, voyage, cargo, crew, passenger, equipment condition, etc.

Collected by USCG; currently shared with intel and operations centers through manual web interaction, fax, and point-to-point data connections.

SILO

“Maintain in coordination with cognizant authorities and centers, a single, integrated lookout (SILO) list of all vessels of domestics and global interest.”

- *GMII Plan*



Attribute-Based Access Control

With Leverage of ABAC, Spiral 3 will continue to expose data sources and allow the DS COI to:

- **Move beyond unrestricted sharing and ensure secure sharing of ANOA and SILO data to:**
 - **Law Enforcement**
 - **DHS (beyond USCG)**
 - **Coalition Partners**
- **Ensure greater level of control of data in accordance with information sharing laws, policies, and agreements.**
- **Federated: Publishers maintain attribute store for published data.**
- **Provide risk reduction for future PORs by proving out ABAC as an early user within NCES**

The DS COI is monitoring the CMA JCTD development of a Maritime Information Exchange Model. Our intent is to adopt best practices from the MIEM in the DS COI information exchange schema.



Risk Reduction/Mitigation

Leveraging and Investigating Emerging SOA Infrastructures

- DISA NCES
- DHS HSIN

Interagency data sharing and interoperability (need to share)

DoD Exercise Environments for MUA

- Coalition Warrior Interoperability Demonstration (CWID) – Joint
- Trident Warrior – Navy
- SeaHawk – Law Enforcement (Depts of Justice & Homeland Sec’y)

C&A in a Net-centric environment

Security and Access Policy (federal, non-federal, coalition)

Global Maritime Situational Awareness



Conclusion

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