The Overall Classification of this Briefing is:
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Maritime Domain Awareness: The Missing Piece of the Security Puzzle

NDIA/HIS Port Security

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30 March 2006

Willing to strike …

Vessels as:

- Direct Weapons
- Delivery of WMD
- Delivery of Terrorists
- Targets

US Maritime interests:

- High economic impact
- Much critical infrastructure
- Near large, dense population centers

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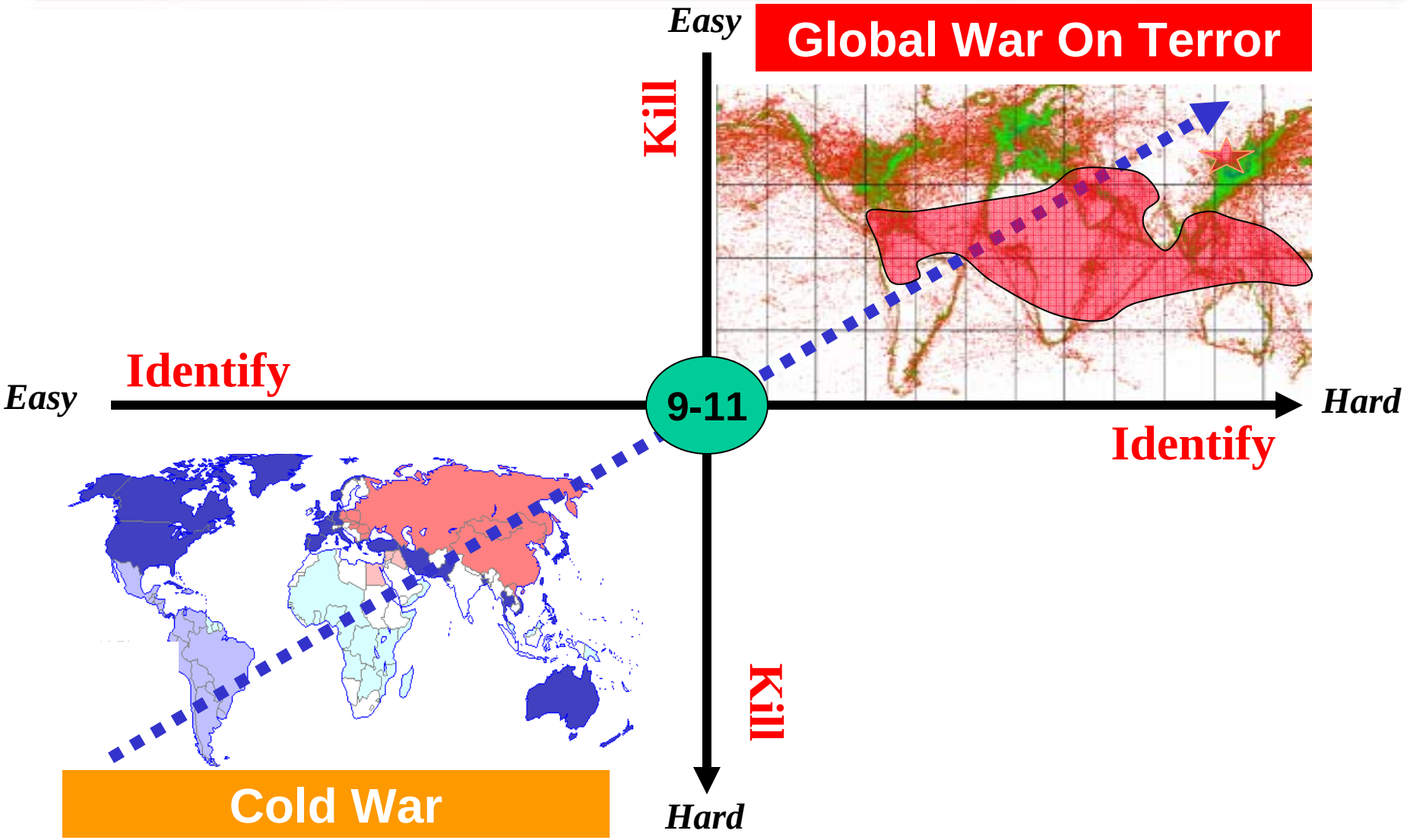
The New Competitive Landscape



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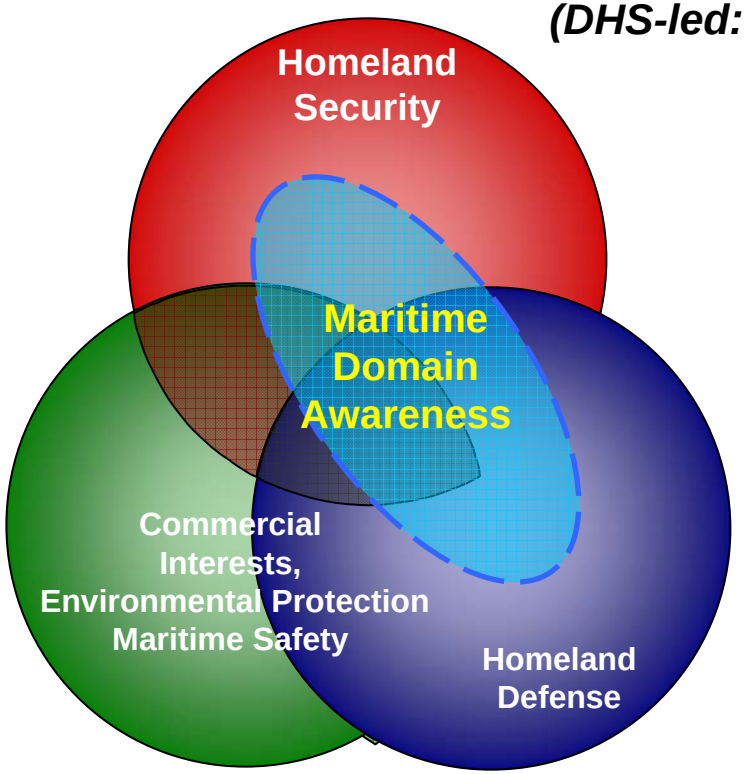
MDA Defined

"…the effective understanding of anything associated with the global Maritime Domain that could impact the security, safety, economy, or environment of the United States."

- ***NSPD 41 / HSPD 13, 21 Dec 04***

Maritime Homeland Security
(DHS-led: USCG)



Maritime Homeland Defense
(DoD-led: USNORTHCOM)

Maritime Domain Awareness

Observables	*Collect*	*Fuse*	*Analyze*	*Disseminate*	Decide/Act
• Vessels • People • Facilities • Cargo • Infrastructure • Sea lanes • Threats • Friendly forces • Weather	• Sensors • Operators & field personnel • Intel. agencies • Open source • Private sector data • Law Enf • Intl Sources	• Tracks w/ tracks • Data w/ data • Tracks w/ Data	• Anomaly Detection • Pattern Recog & analysis • Compare w/ rules • Research tools	• Networks • Displays (COP/UDOP) • Command Centers	• Strategic • Operational • Tactical

Situational Awareness

Current & Predictive Intelligence

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Collect – Vessel Tracks

		LARGE (> 65')			MEDIUM (25' - 65')			SMALL (< 25')		
		COOP	EMIT	DARK	COOP	EMIT	DARK	COOP	EMIT	DARK
Shore (12 nm)	In Place	1	2	2	3	2	2	3	2	2
	Available									
	Risk									
Approaches (12 - 90 nm)	In Place	1	7	7	7	7	7	7	7	7
	Available									
	Risk									
Off Shore (300 nm)	In Place	9	9		9	9				
	Available									
	Risk									
Global Maritime Domain	In Place	9	9		9	9				
	Available									
	Risk									

1 Coastal / National land based AIS receivers and data fusion
2 No extensive coastal radar systems deployed except around VTS and Hawkeye / JHOC ports
3 No AIS or other beacon requirement for smaller than SOLAS - technology is readily available
7 No persistent sector surveillance capability today
9 National Technical Means

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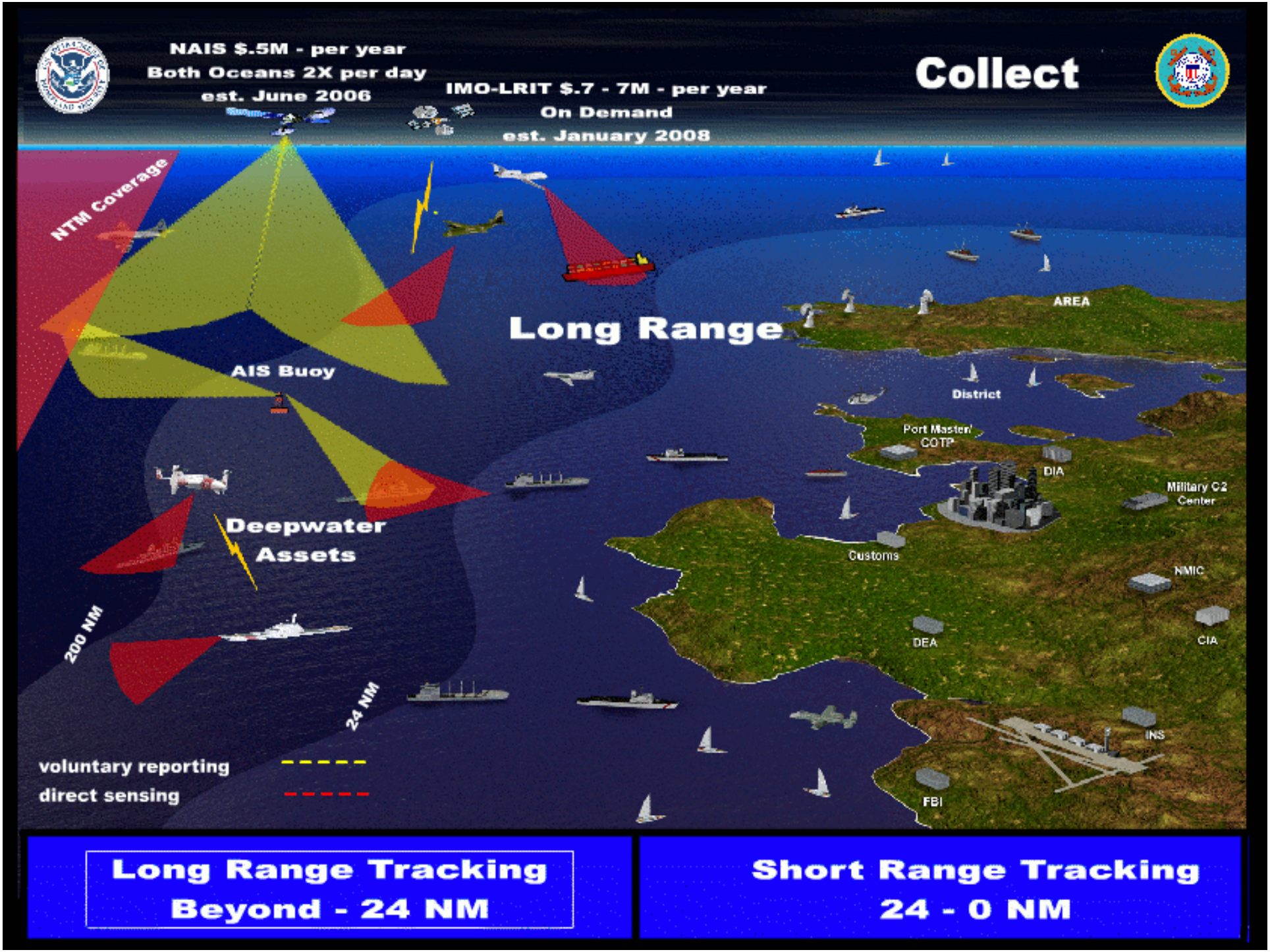
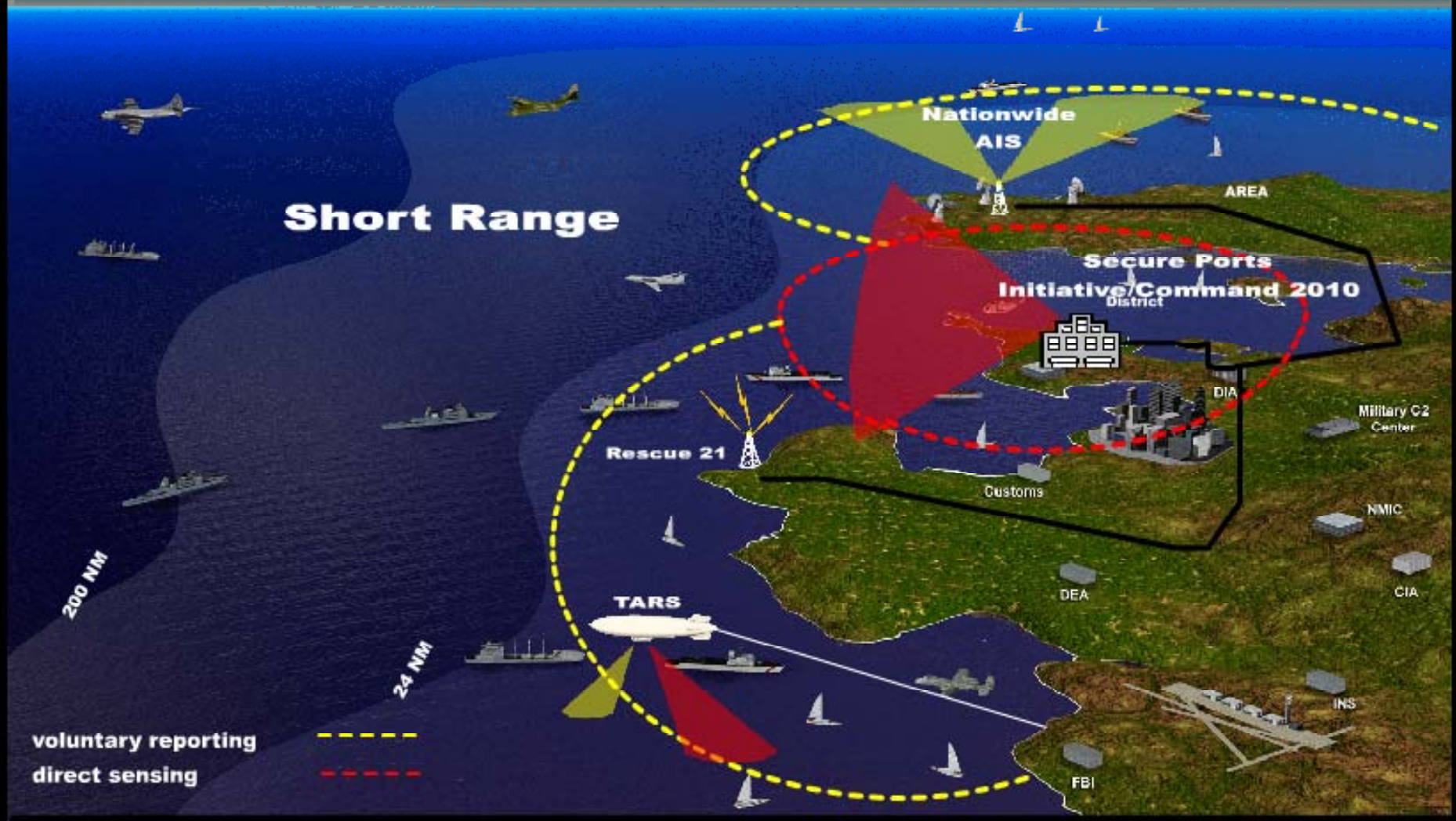

NAIS $.5M - per year
Both Oceans 2X per day
est. June 2006
IMO-LRIT $.7 - 7M - per year
On Demand
est. January 2008
Collect
NTM Coverage
Long Range
AIS Buoy
Deepwater
Assets
200 NM
24 NM
AREA
District
Port Master/
COTP
DIA
Military C2
Center
Customs
NMIC
DEA
CIA
INS
FBI
voluntary reporting
direct sensing
Long Range Tracking
Beyond - 24 NM
Short Range Tracking
24 - 0 NM

Collect



Long Range Tracking
Beyond - 24 NM

Short Range Tracking
24 - 0 NM

Collect – Data Sources

- **Vessel** – Lloyds, photos, historical movement, SANS, MISLE, Pathfinder, VIS, Seawatch
- **Cargo** – CBP, e-manifests, Tradebytes, Global Trader
- **People** – NTTC, MISLE, TECS, APIS (CPB)
- **Infrastructure/Facilities** – PISRAT, ESRI GIS, CEU
- Intelligence Community data/info
- Multiple classification domains (HAGs)

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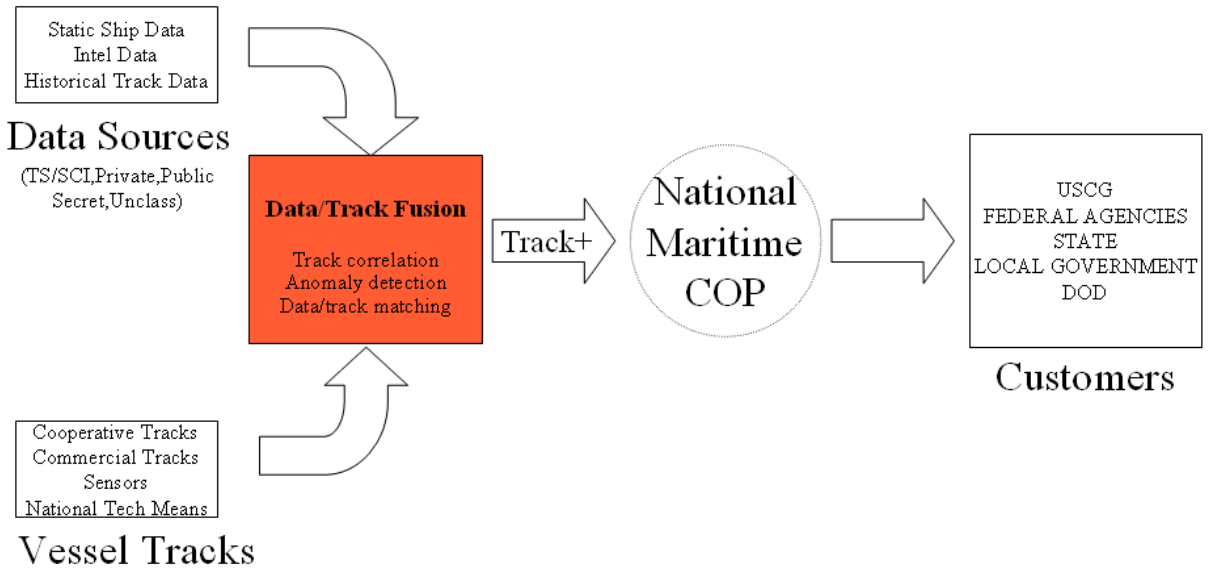
Fuse

"The process of combining data or information to estimate or predict entity states."

Revision to the JDL Data Fusion Model, 1998 NATO/IRIS Conference

- **Detect and track maritime objects**
  - **Data Discovery**
  - **Separate the noise from the signals**
- **Combine data sources**
  - **Public**
  - **Commercial**
  - **Government**
- **Identify Threats**
  - **Fusion**
  - **Anomaly detection**
  - **Alerts**



Vessels, Cargo, People, Infrastructure

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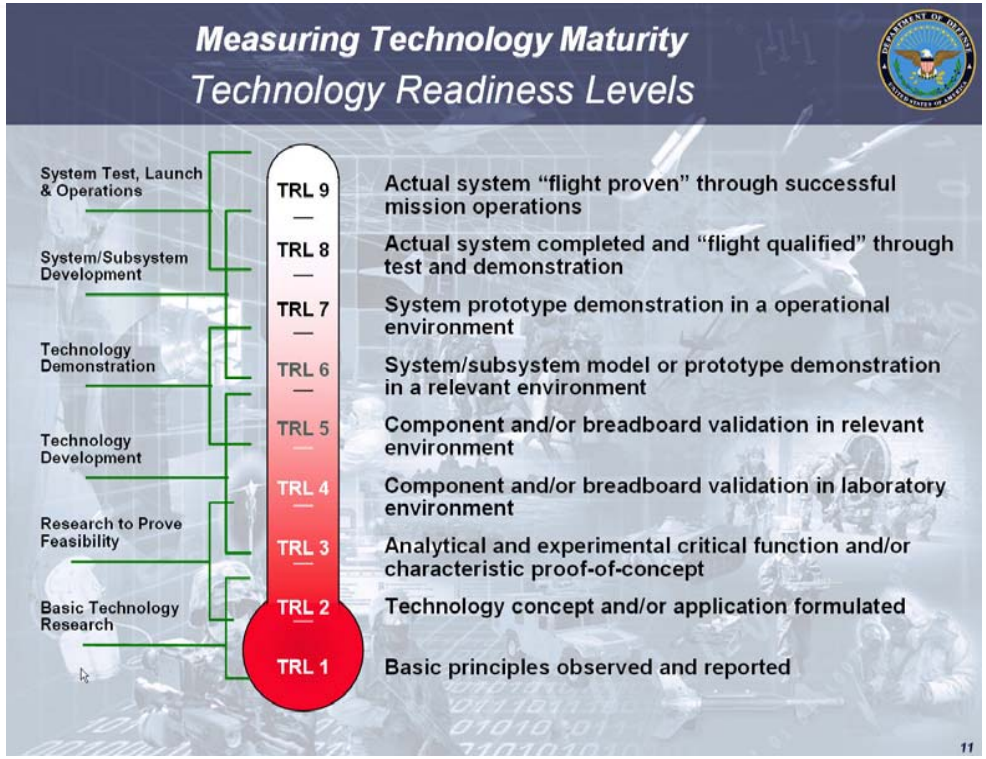
Fusion - Operational to System Functionality Matrix

Multi-INT Data Fusion: Operational Capability to System Functionality Matrix

Feb 13, 2006, Ver 10.7		Detect, identify, and track individual entities of interest			Assess and describe communities and processes of concern involving maritime entities (vessels, cargo, people)			Determine and assess threat level of maritime entities (vessels, cargo, people)	
		Detect, Identify, and Track Vessel(s)	Identify and Track Cargo	Identify and Track People	Generate Associations	Identify Association Clusters	Analyze Associations to Identify COC/POC	Recognize Anomalous Behavior in the Context of Normal	Identify All Entities Associated with Threat
System 1	**Data Processing/Analysis**								
	Associate Similar Data Types								
	Associate Dissimilar Data Types								
	Automatic Data Registration								
	Process Unstructured Textual Data								
	Semantic Processing/Analysis								
	Entity Analysis								
	Process Kinematic Data								
	Process Attribute and Feature Data								
	Generate Alternate Hypotheses								
	Automatic Identification								
	Automatic Track Generation								
	Provides Track Quality								
	Provides Confidence Levels								
	Process Vessel Data								
	Process Cargo Data								
	Process People Data								
	Situation & Threat Analysis								
	Co-Process Textual and Other Data								
	Prediction								
	Generate Alternate Hypotheses								
	Provides Confidence Levels								
	Process Political and Economic Data								
	Process Physical Environmental Data								
	Automatic Anomaly Detection								
	Automatic Threat Identification & Classification								
	Multidimensional Analysis								
	Contextual Analysis								
	Semantic Processing/Analysis								
	Ontology-based Processing/Analysis								
	Operator Alerts for User-Defined Requests								
	Multidimensional Analysis								
	Data Mining								
	Spatial Analysis								
	Temporal Analysis								
	Spatiotemporal Analysis								

0	Functionality not developed
1	TRL 1-3
2	TRL 4-6
3	TRL 7-9



- Generated for each fusion project
- Government and Industry projects
- Attributes (rows) help categorize fusion automation capabilities

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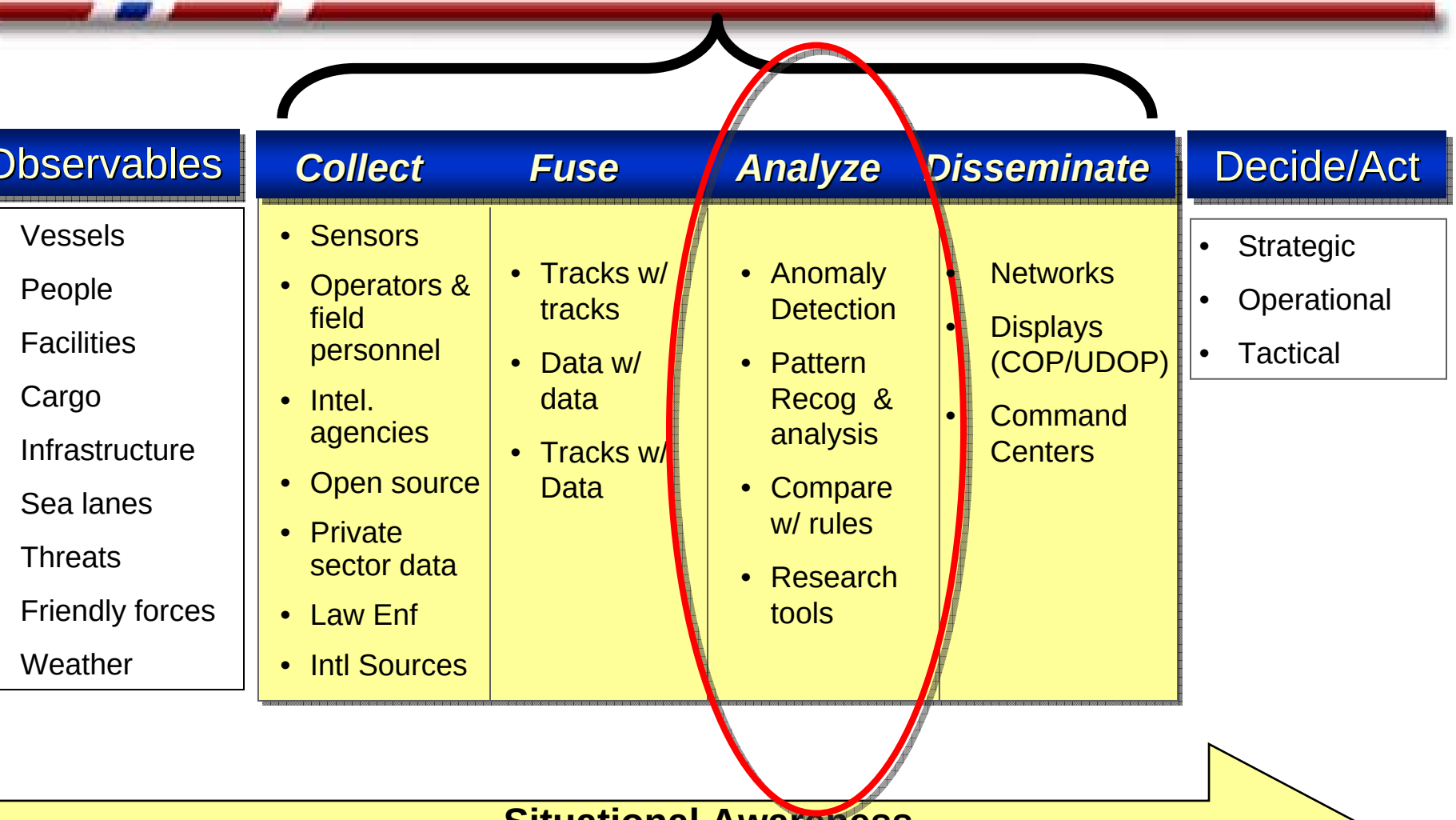
Maritime Domain Awareness



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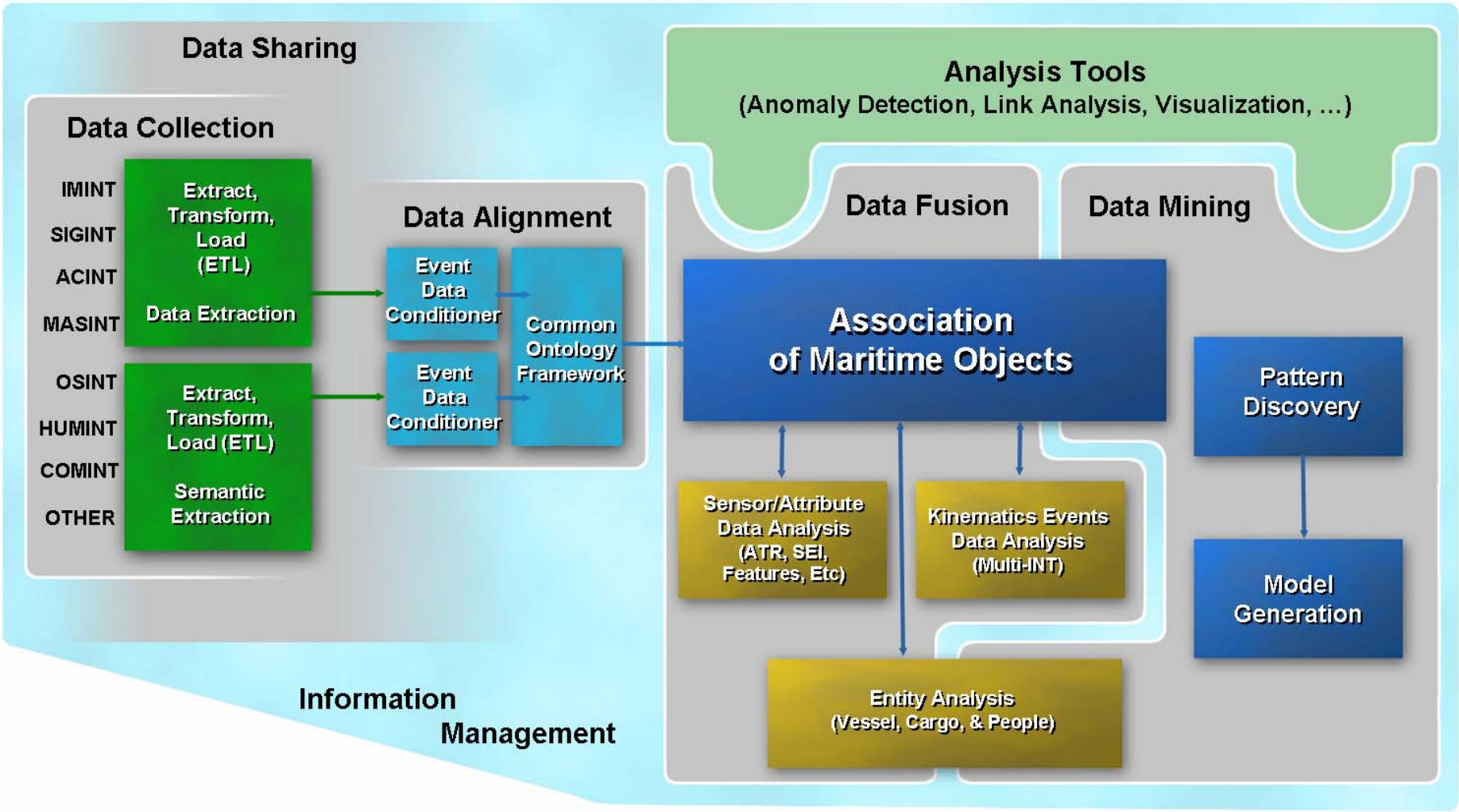
Notional CG Enterprise Framework



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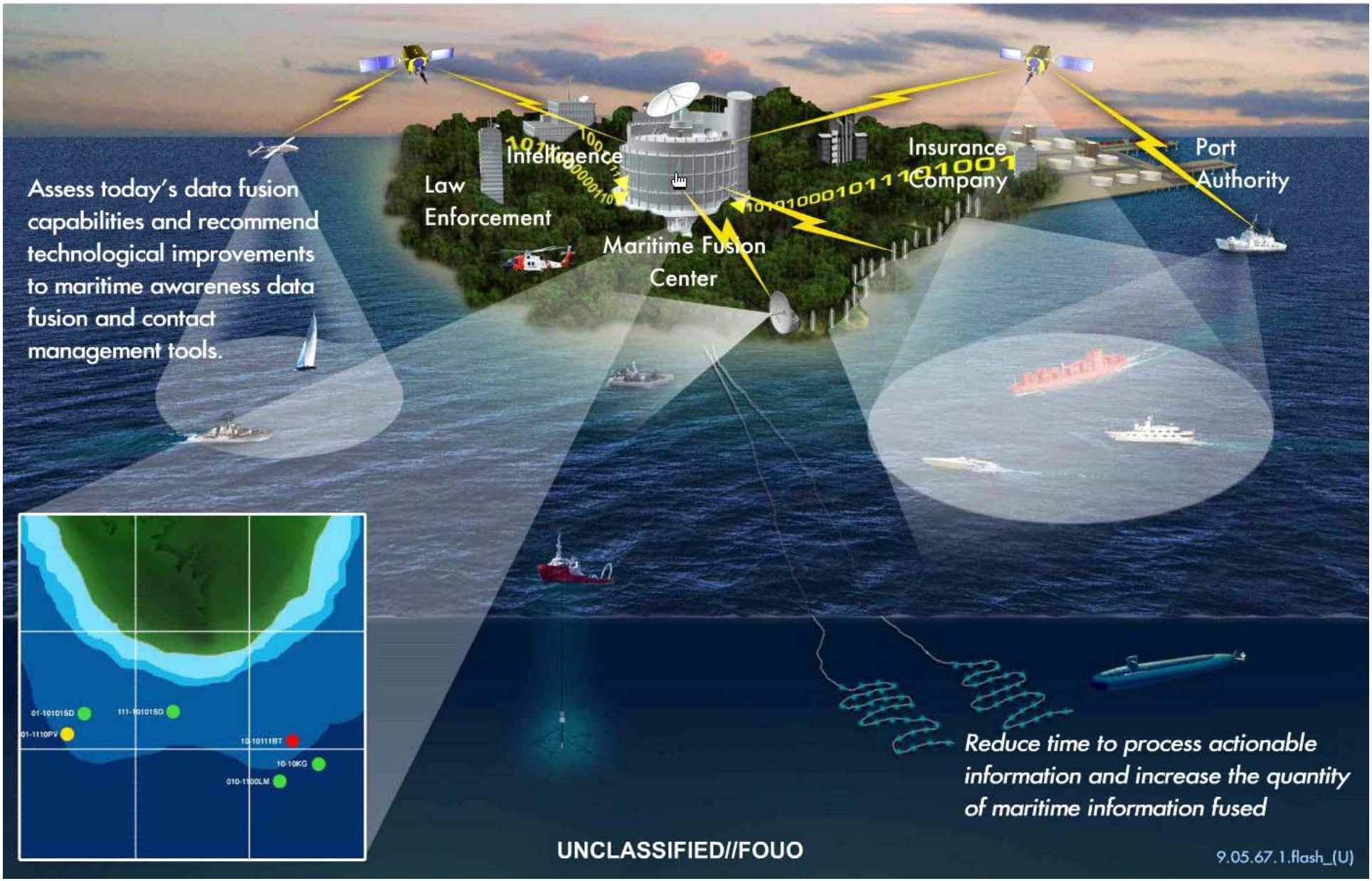
Fuse & Analyze



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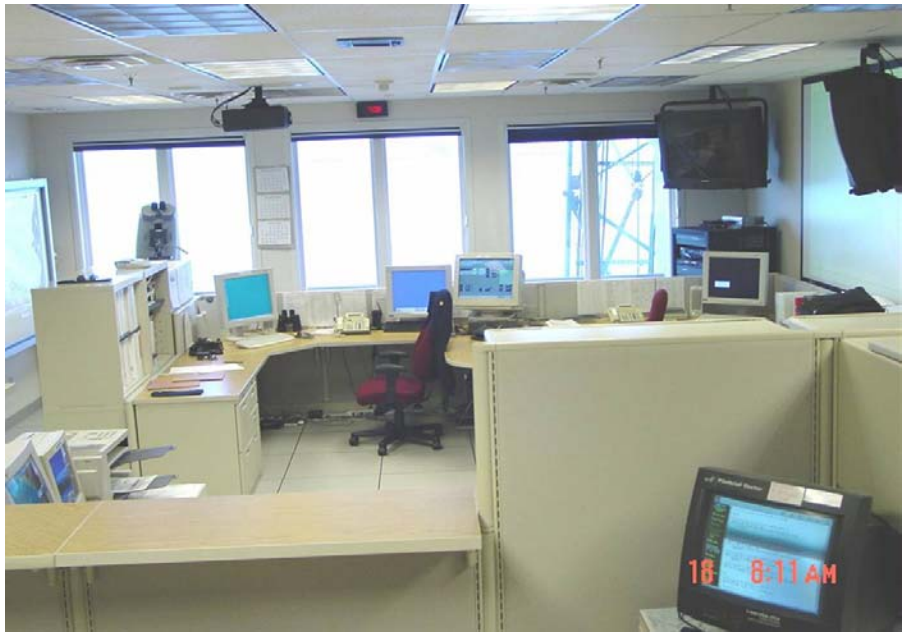
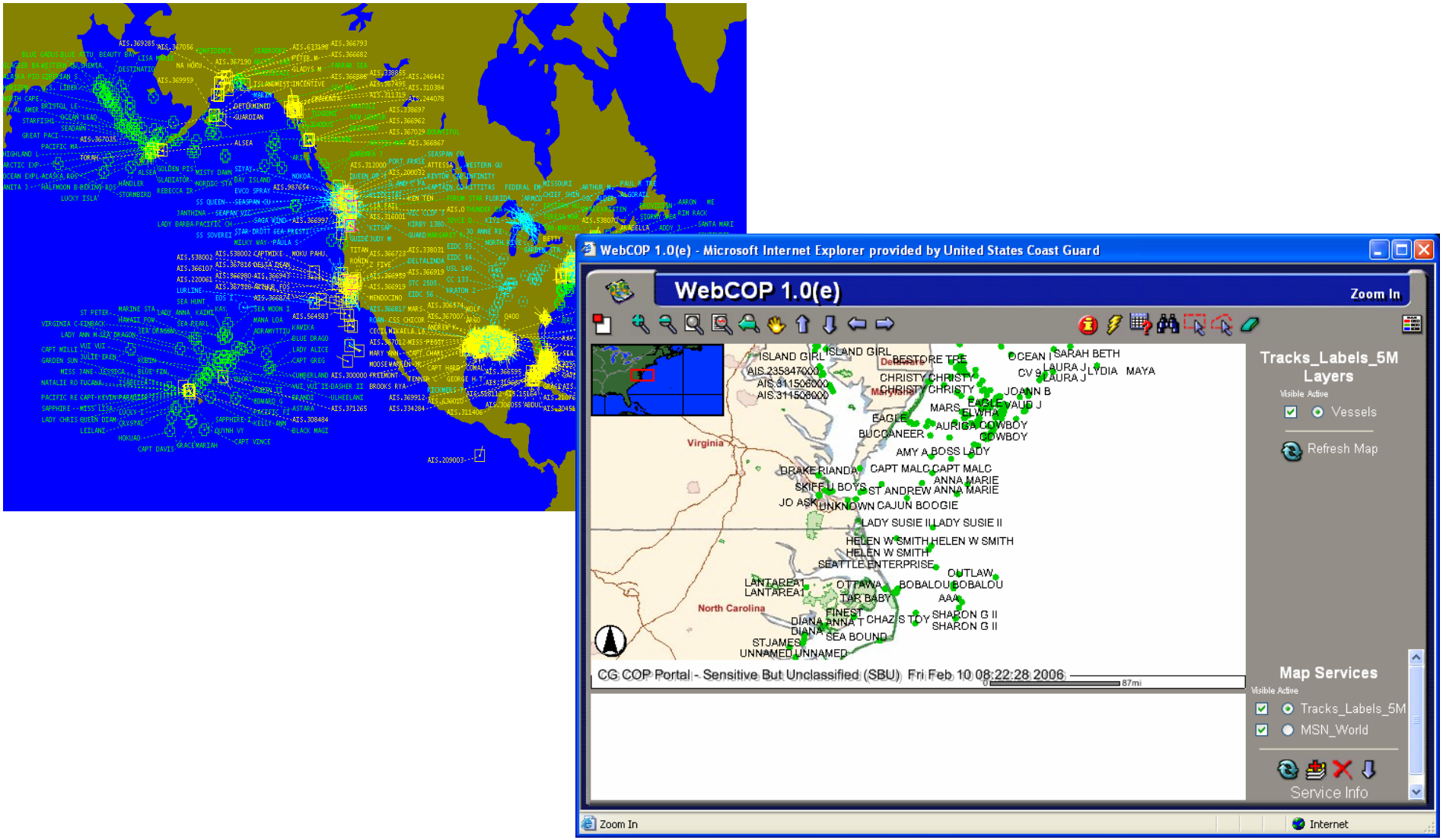
Disseminate - Networks

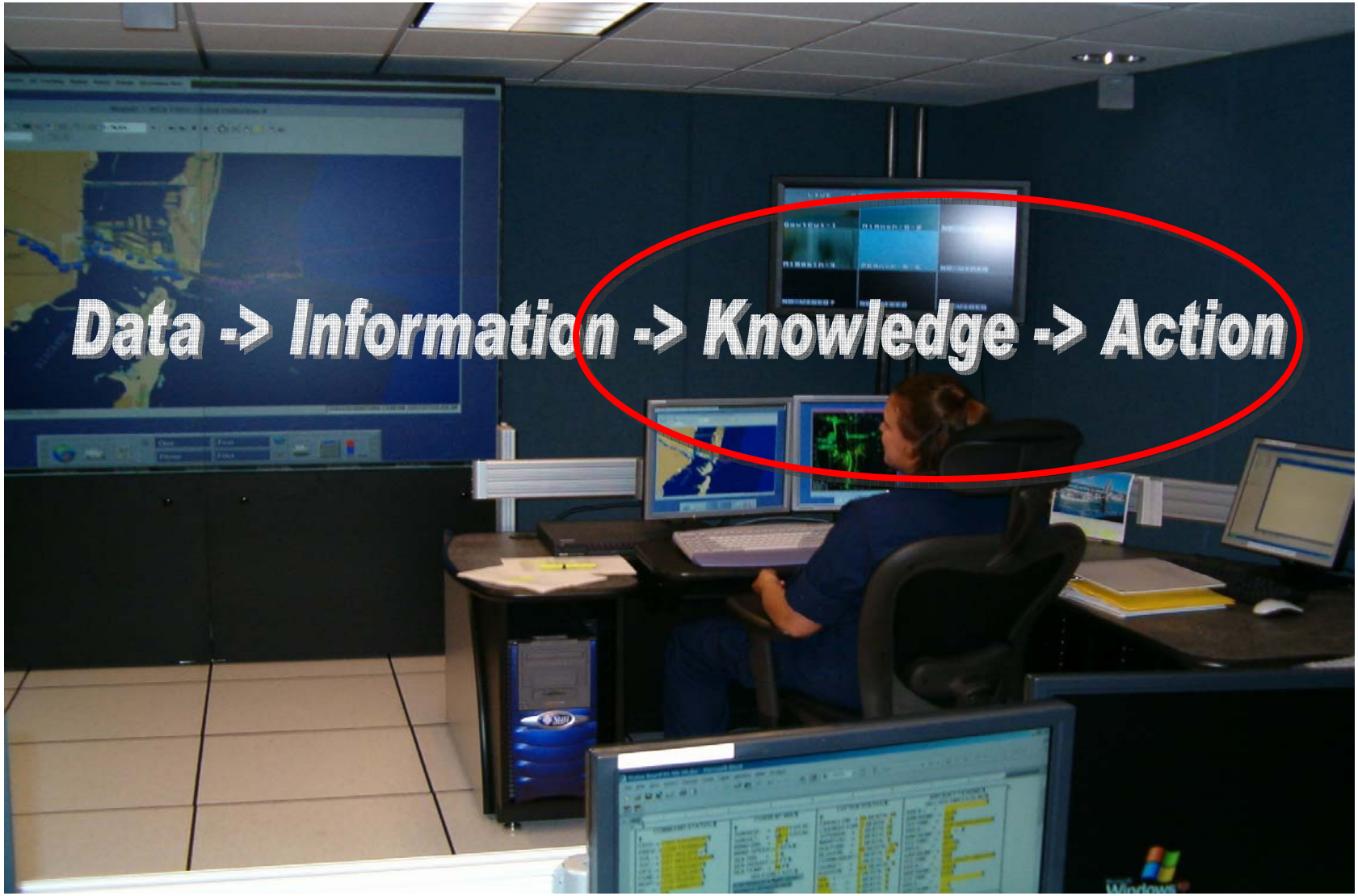
- CGDN+/ DHS One Net
- SIPRNET
- JWICS
- Broadcasts
- IWN
- Internet
- MAGNet/ High Assurance Guards



Disseminate – COP/ UDOP



Disseminate – Command Centers



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National Strategy for Maritime Security

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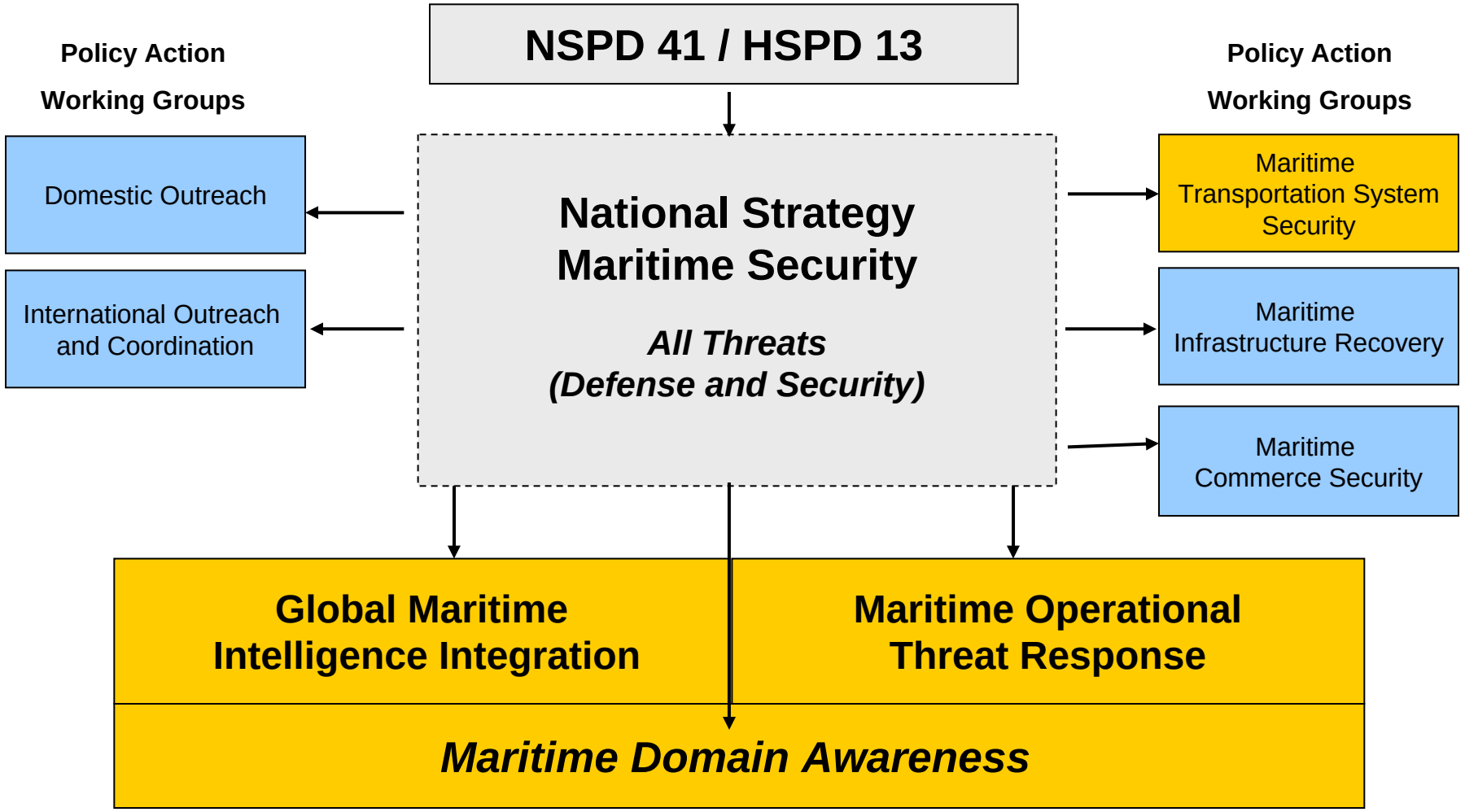
Maritime Security Policy and MDA



Requires Unity of Effort

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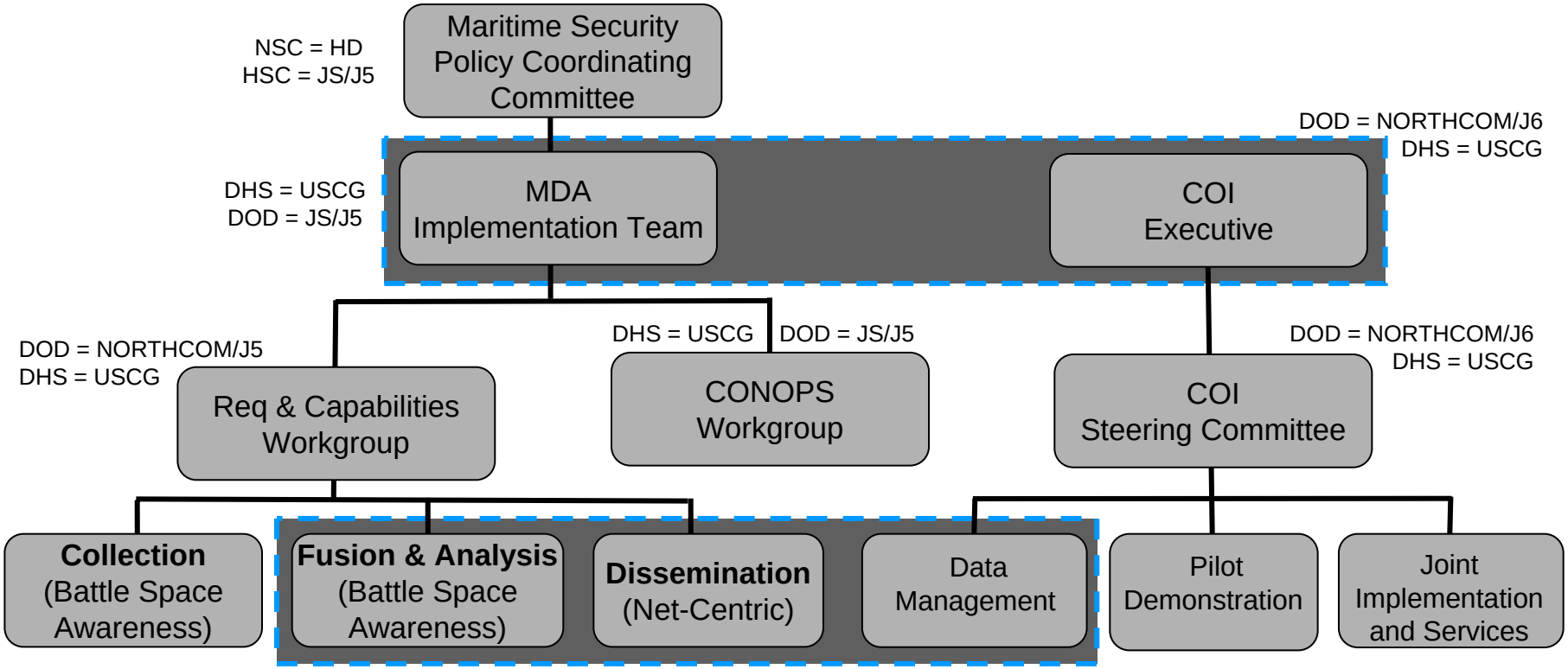
National MDA Implementation



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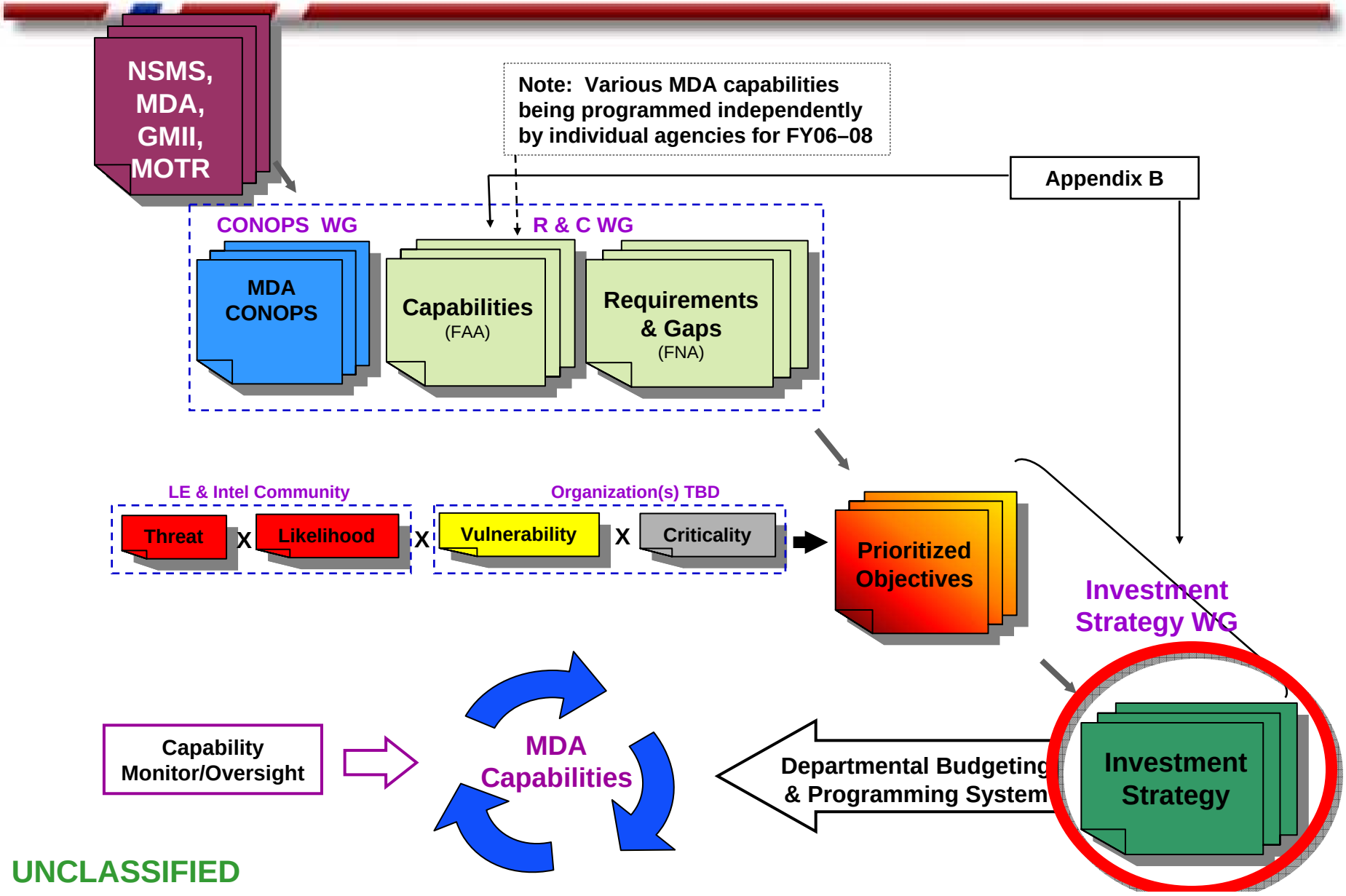
National MDA Implementation Process



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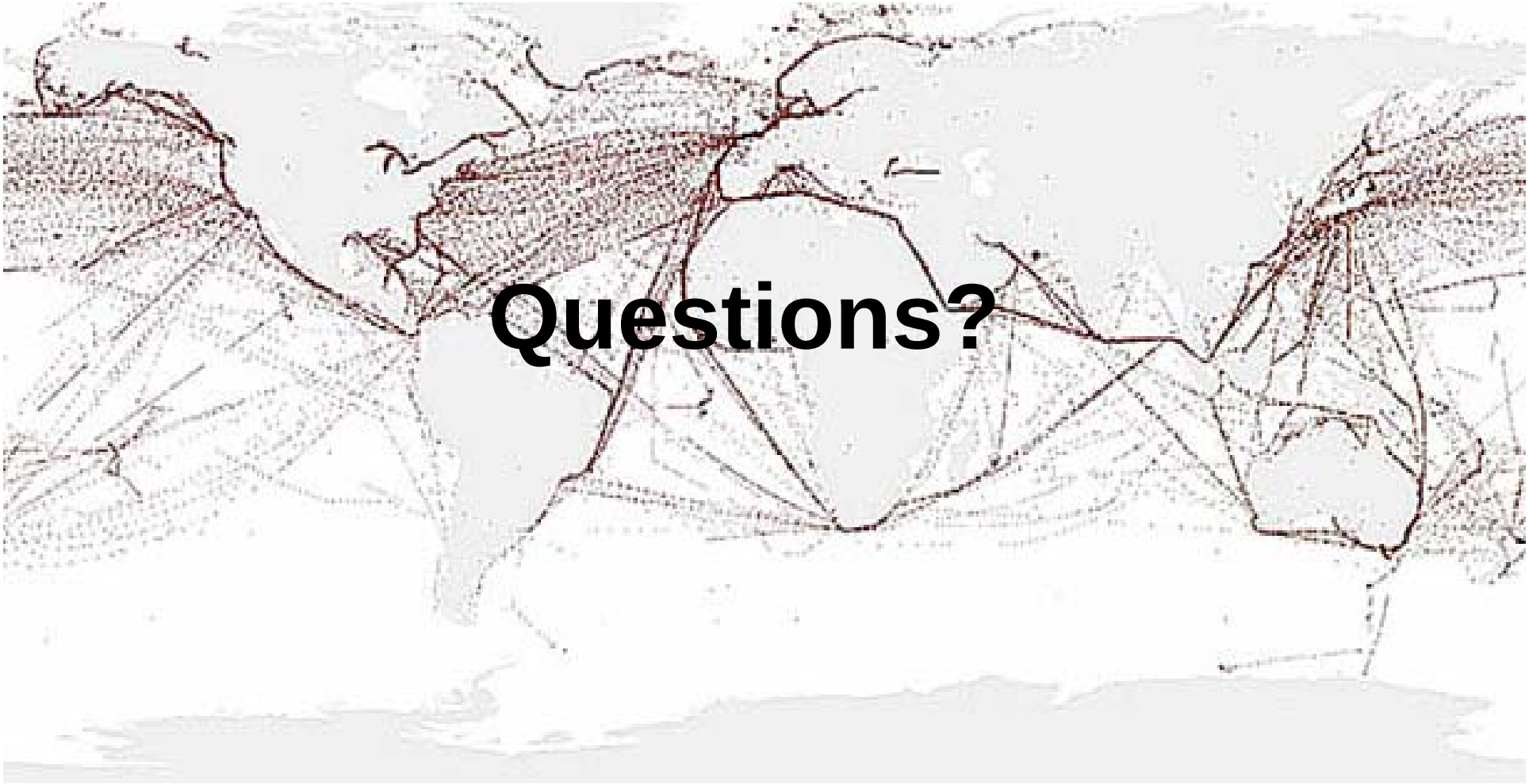
MDA – Connecting the Dots



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Collect
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Beyond - 24 NM
Short Range Tracking
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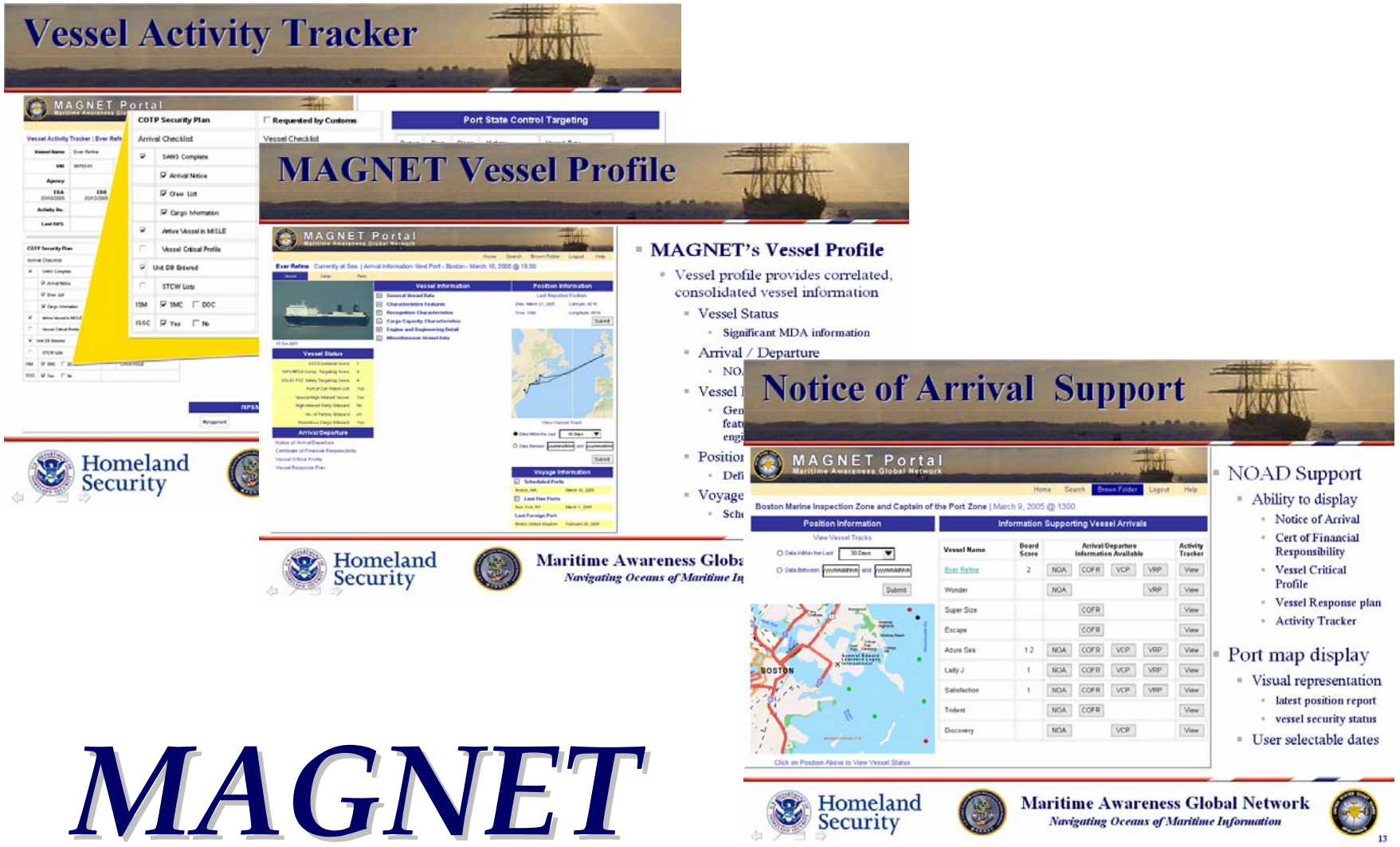
Fuse & Analyze



MAGNET

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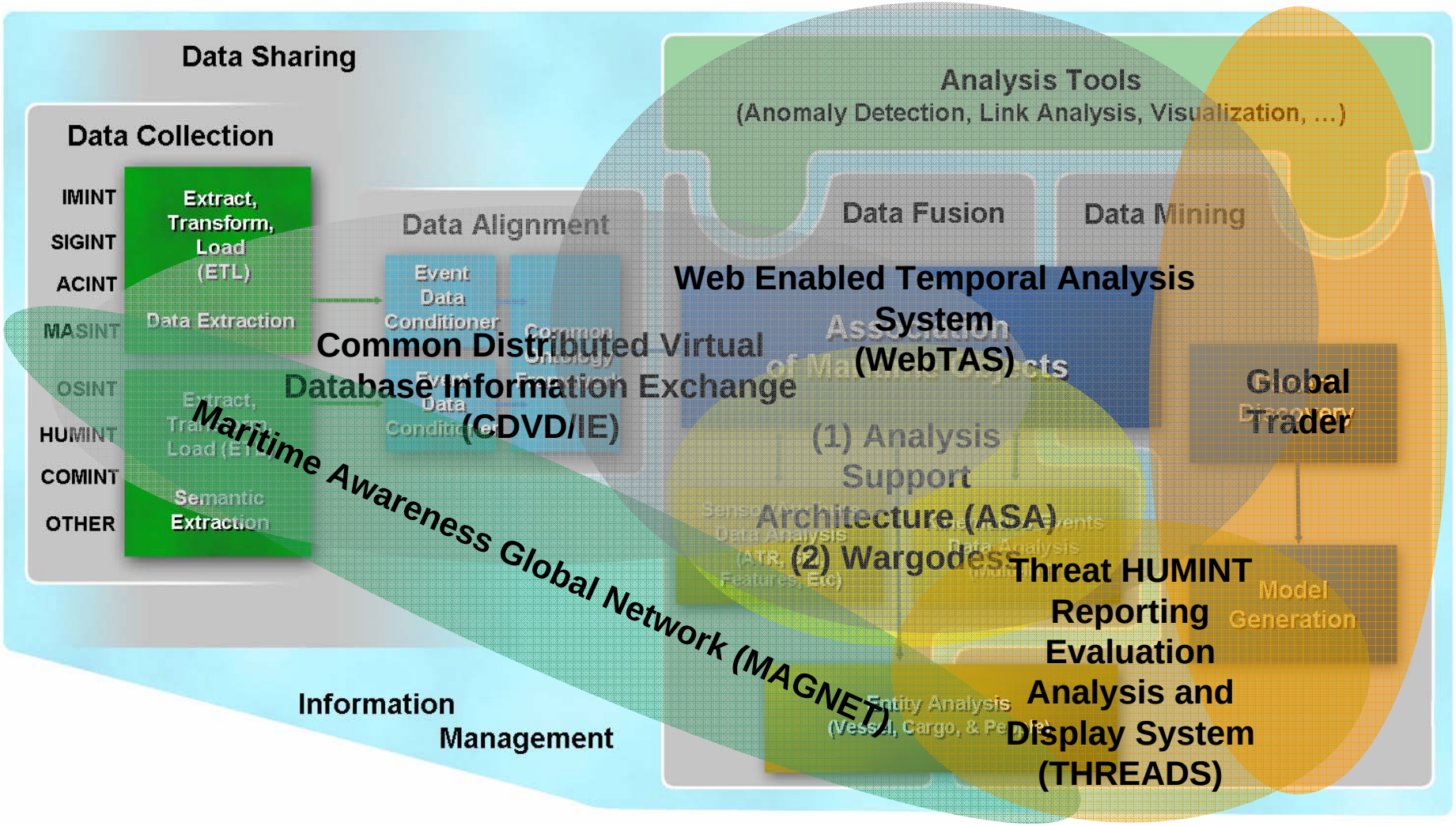
CG Enterprise Framework