



**Program Executive Office
Command, Control, Communications,
Computers and Intelligence (PEO C4I)**

**Information Dominance Trends and
Strategies**

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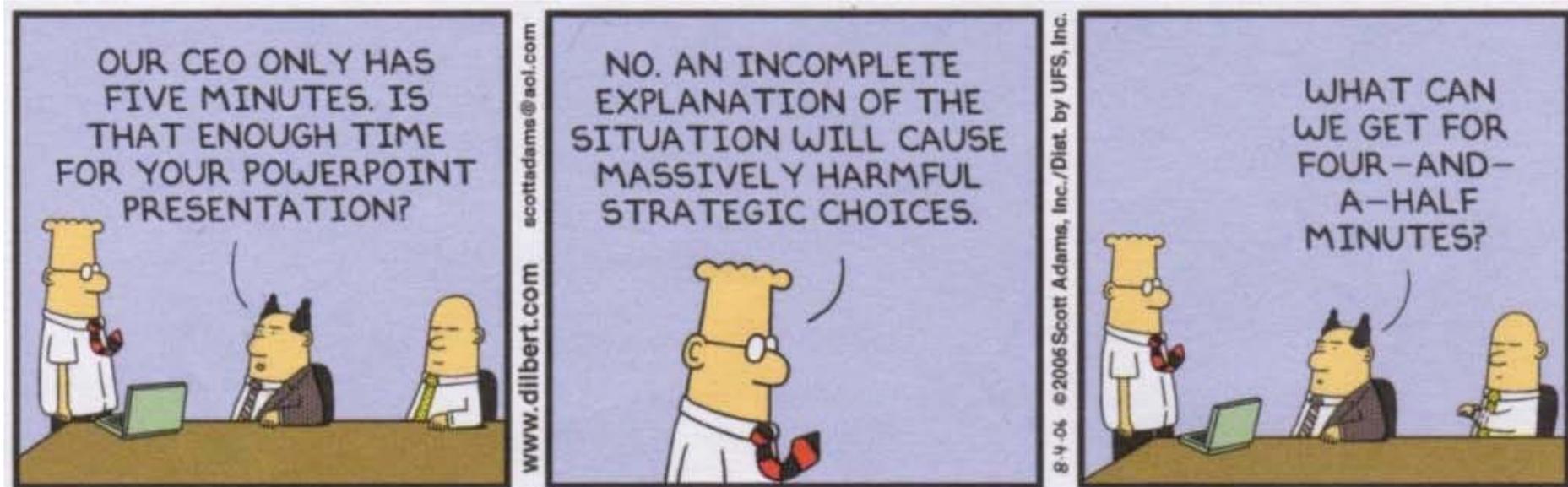
***Information Dominance
Anytime, Anywhere...***





BLUF

- Information Dominance presents huge challenges and requires a fundamental transformation
- Results = Innovation + Speed + TOC
- Everybody has to play...





PEO C4I Strategic Priorities

Vision

Information Dominance: Anytime, Anywhere ...

Mission

Provide integrated communication and information technology systems that enable information dominance and the command and control of maritime forces

Strategic Goals

MINIMIZE COST, DELIVER CAPABILITY

“Minimize total ownership cost, while delivering integrated C4I capabilities”

RAPID CAPABILITIES TO THE WARFIGHTER

“Foster focused innovation to rapidly field relevant capabilities to meet existing and emerging warfighter needs”

DEVELOP WORKFORCE, ACHIEVE EXCELLENCE

“Develop an aligned, agile workforce equipped to achieve acquisition excellence in a dynamic environment”





Current Environment

Information Dominance Relationships

OPERATE



Carry out tasking as directed by POTUS



Navy support to US CYBERCOM

Generate Requirements



Operate the network

ADMINISTRATE



Plan & Program

Validate Req'ts (e.g. JCIDS)



Man, Train, & Equip



Cyber Type Commander

DEVELOP, ACQUIRE & FIELD



DoD 5000
SECNAV 5000

SPAWAR
Operating Agreement

Execute the Budget

SPAWAR





Process Evolution



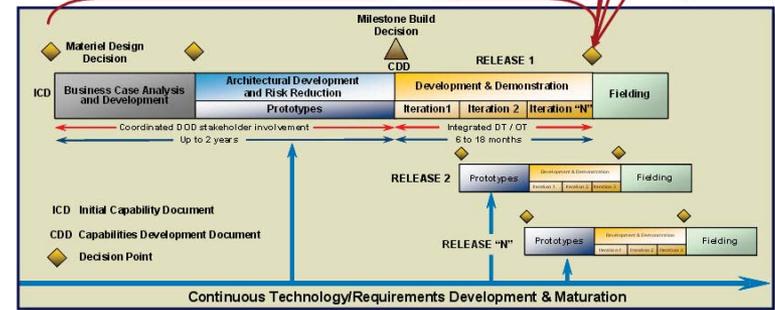
Accelerating Acquisition and Delivery Processes Must Enable Information Dominance

Improving Output over Cost

- Common infrastructure allows us to more rapidly iterate capabilities
- Incremental approach = reduced risk + accelerated delivery
- Leveraging Joint/COTS products = reduced R&D costs

- Incrementalized Requirements (IT Box) ??
- Incrementalized Budgets ??
- Iterative S&T Investments ??
- Iterative Systems Engineering ??

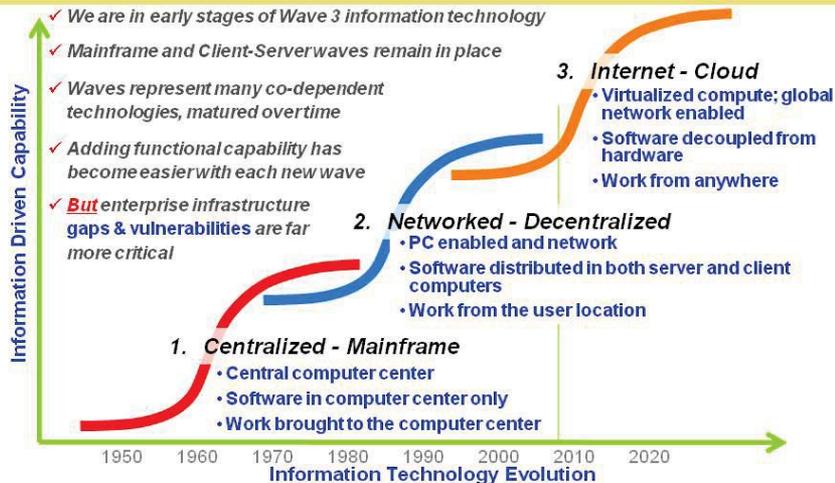
- NMP (SHIPMAIN) ??
- FRCB ??
- Testing ??
- C&A ??



6



Information Dominance Opportunity Dilemma



Navy is using Wave 2 processes – but requires Wave 3 capability

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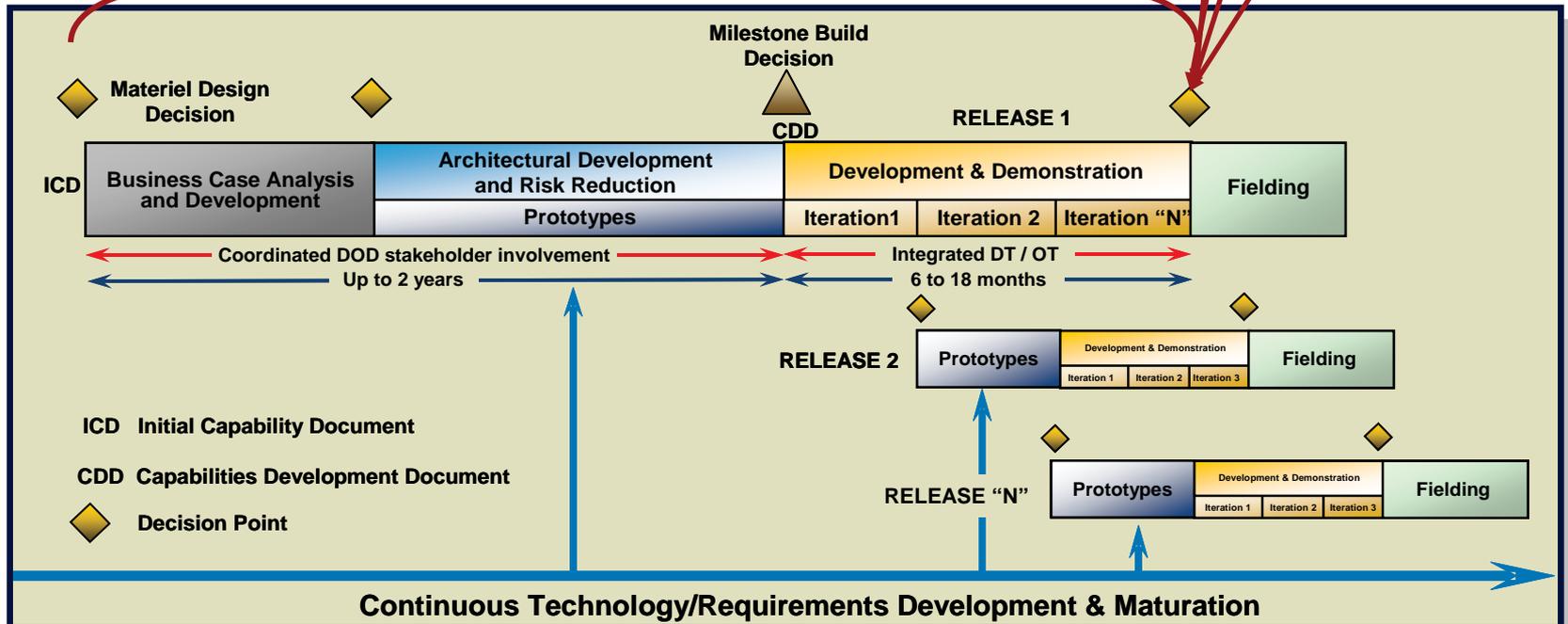
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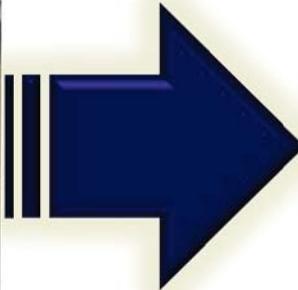


The Road to Information Dominance

Mission Driven Infrastructure

Key Enablers

- Reduce or eliminate legacy infrastructure
- Open Architecture
- Consolidate computing environment
- Data Strategy
- Dynamic Bandwidth Allocation
- Innovation, collaboration and reuse (process & technology)

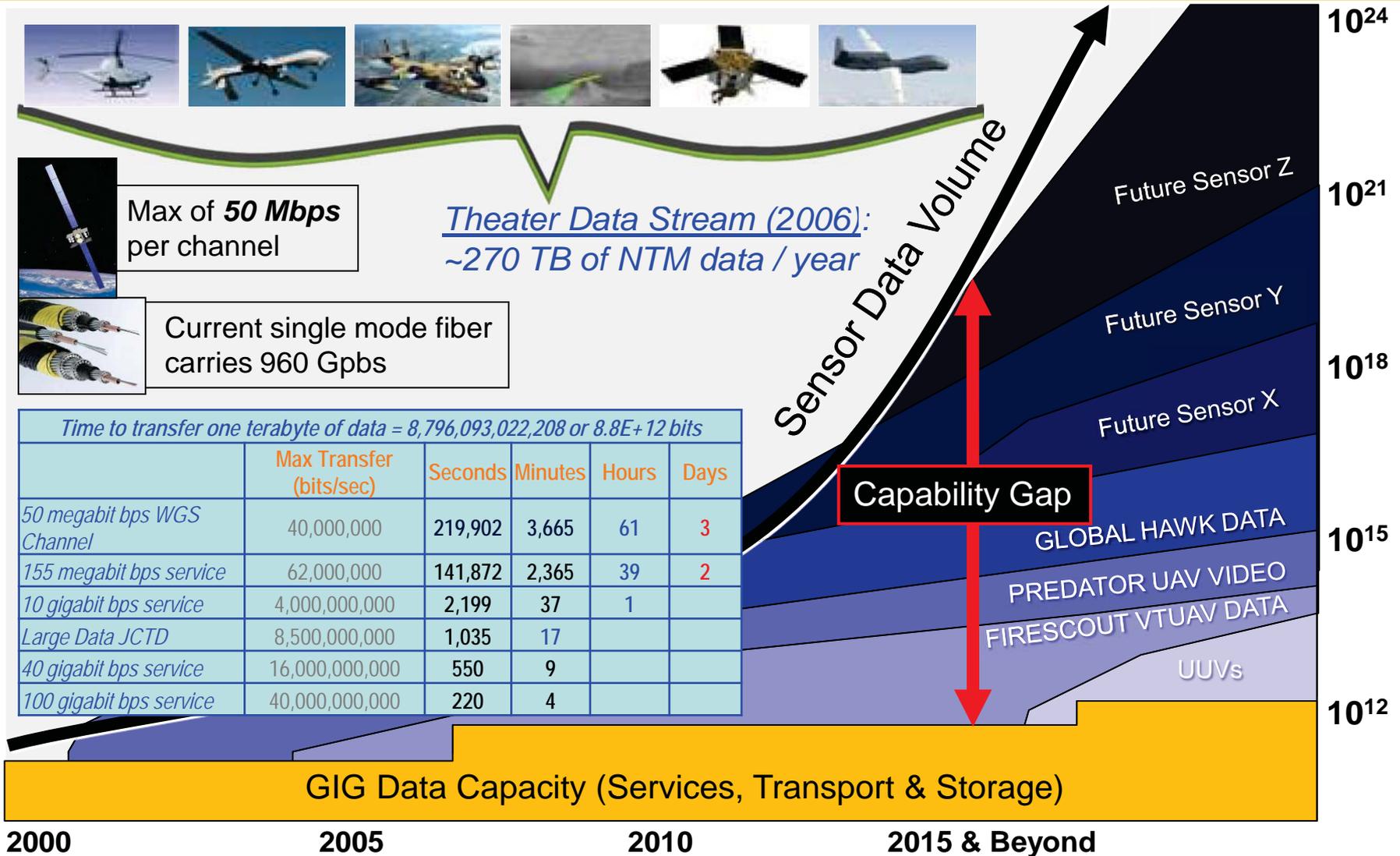


Mission Driven Infrastructure

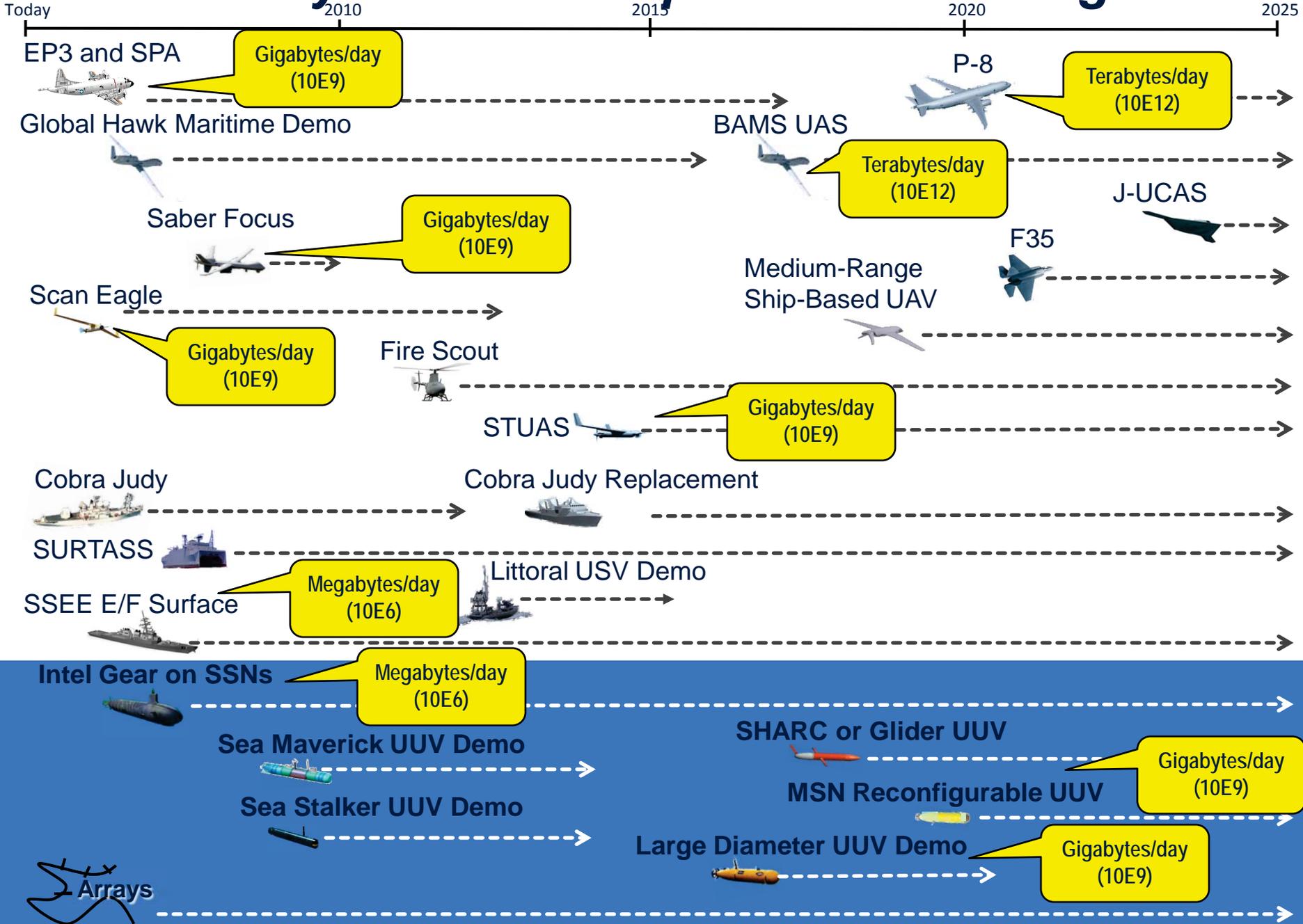


Information Dominance Challenge

Exponential Data Growth Outpaces Infrastructure



Navy ISR Roadmap... Data Challenges





10x Growth of UAV Expenditures since 2000

Puma



MQ-9 Reaper

SOURCE: AeroVironment. Used with permission.



SOURCE: U.S. Air Force photo by Staff Sergeant Brian Ferguson.

RQ-11 Raven



SOURCE: U.S. Air Force photo by Dennis Rogers.

ScanEagle



SOURCE: U.S. Navy photo by John F. Williams.

Hummingbird



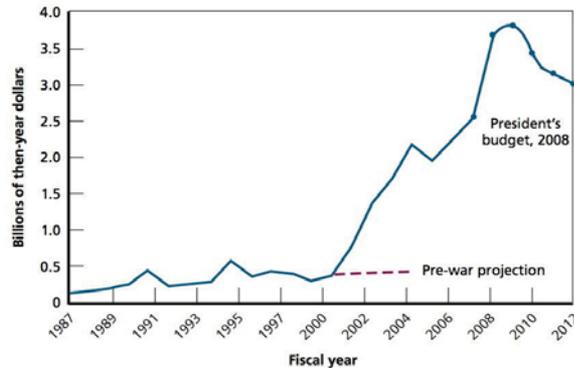
SOURCE: Boeing Company. Used with permission.

MQ-8B Fire Scout



SOURCE: U.S. Navy photo by Kurt M. Lengfield.

DoD Investment in Unmanned Aircraft Systems



SOURCE: Unpublished RAND research by Brian Alkire, Jessie Riposo, Randall Steeb, and Louis Moore.

UCAS-D



SOURCE: Defense Advanced Research Projects Agency.

RQ-4B Global Hawk



SOURCE: U.S. Air Force photo by Bobbi Zapka.

RQ-7 Shadow



SOURCE: AAI Corporation. Used with permission.

Global Observer



SOURCE: AeroVironment. Used with permission.

MQ-1C Sky Warrior



SOURCE: General Atomics. Used with permission.

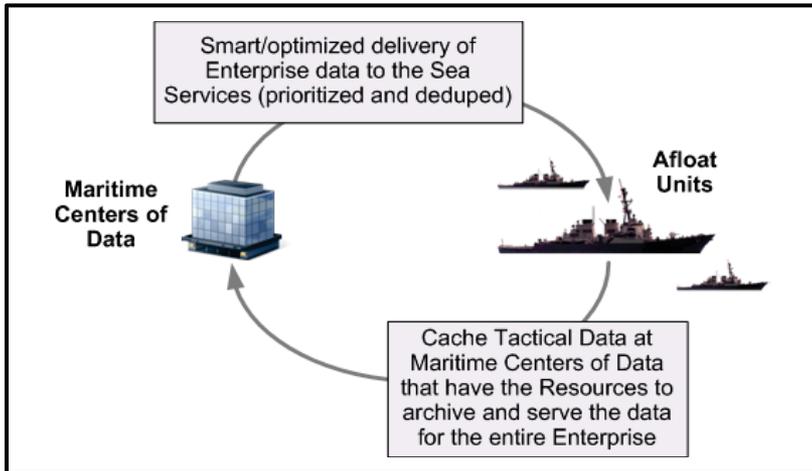


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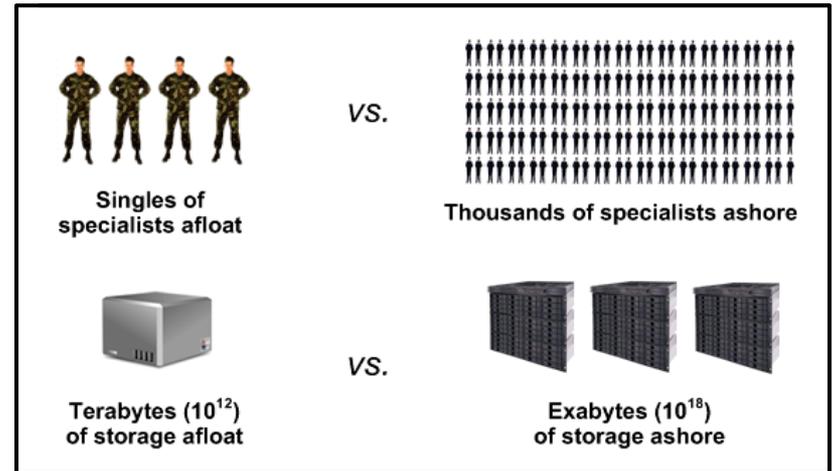


Meeting the Challenge

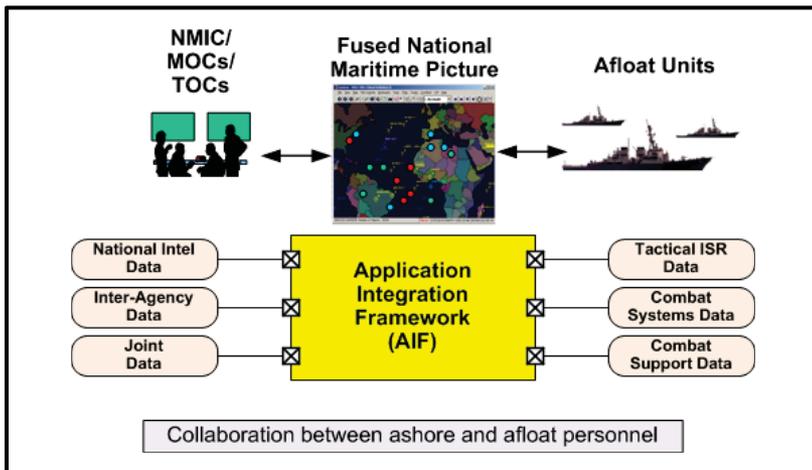
Smarter Data Sharing and Management



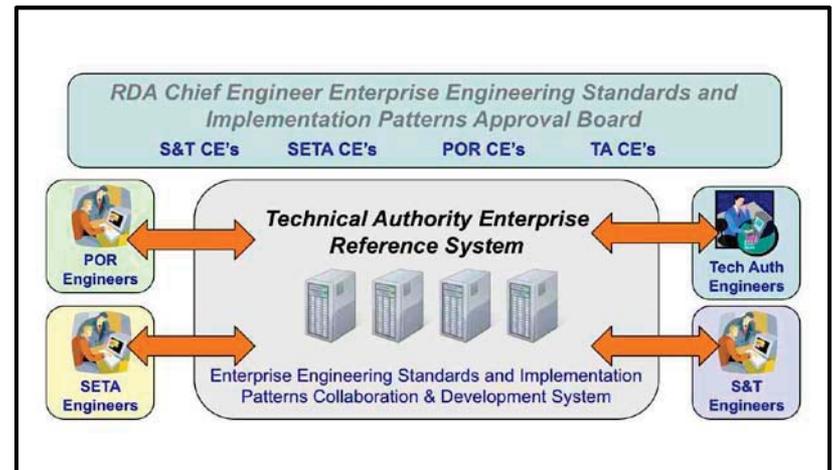
Leverage the Total Workforce



Auto-processing and Analysis Tools



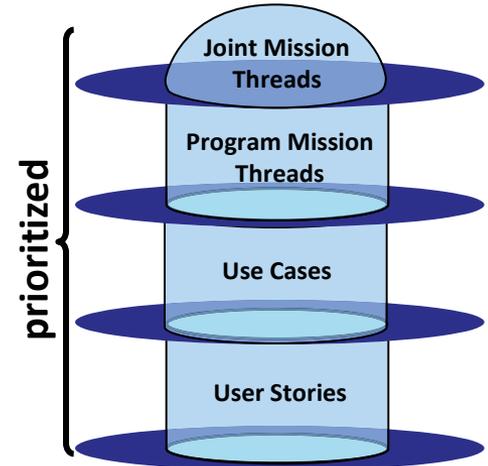
Requirements, Budget, Acquisition Changes





Accelerate... *Innovation and Adaptation*

- ***Establish user-led Capability Requirements Boards*** to prioritize mission area requirements for iterative capabilities (build upon “IT Box” approach)
- ***Evolve the PPBE strategy***
 - Incrementalize development funding to support an iterative approach
 - Align with prioritized S&T investments
- ***Leverage and adapt*** Joint / IC solutions
- ***Operationalize innovation*** by continually conducting collaborative experimentation



Our adversaries have no restraints on innovation...



A Fundamental Transformation



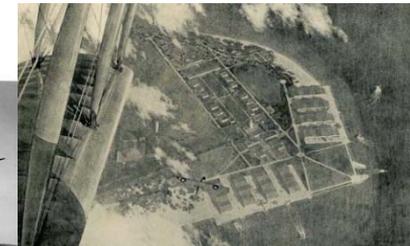
...157 worldwide
coaling stations



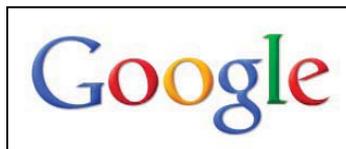
...168 Air Stations; 250 outlying airfields

At the end of WWII:

- 100 aircraft carriers
- 41000 aircraft
- 431000 personnel
- 6768 ships



... Naval Reactors Facilities;
Nuclear Power Schools



... Google's Infrastructure

- 450,000 + servers
- Require 20 Megawatts
- \$2M/mo electric cost 13
- 50 + Petaflops





Summary

Information Dominance is an Enterprise Mandate

- ***Collaboration*** across the spectrum of PEOs, Programs, Platforms, and Stakeholders is imperative
- ***End-to-end capabilities*** eclipse all individual processes or programmatic accomplishments
- Streamline processes and governance using ***mission-driven priorities***



Information Dominance represents a fundamental transformation...



We get IT.

We also integrate it, install it and support it. For today and tomorrow.





Identified MIEA Challenges

	<i>Focus Area</i>	<i>Challenges</i>
1-	Data Access Effective, Sharing, Visualization, and Search	Massive ISR data feeds: inadequate sharing, distribution/storage; overwhelmed analysts
2-	Ashore Infrastructure High Performance C2ISR	Ineffective use of ashore advantages: petabyte data needs big networks, data centers
3-	Collaborative ISR Gateway Large Deck Operations	Full ISR access to Large Decks: effective operations requires effective C2ISR
4-	C2ISR Augment Adaptable Afloat Capability	Enhance Small Deck capability: increase C2ISR capability with augment teams/ISR
5-	Information Assurance Effective & Timely	IA process diverts capability: too much lost implementation time for questionable gain
6-	C2ISR Acquisition Effective & Timely	Acquisition processes misaligned: requirements, budget, and acquisition process broken