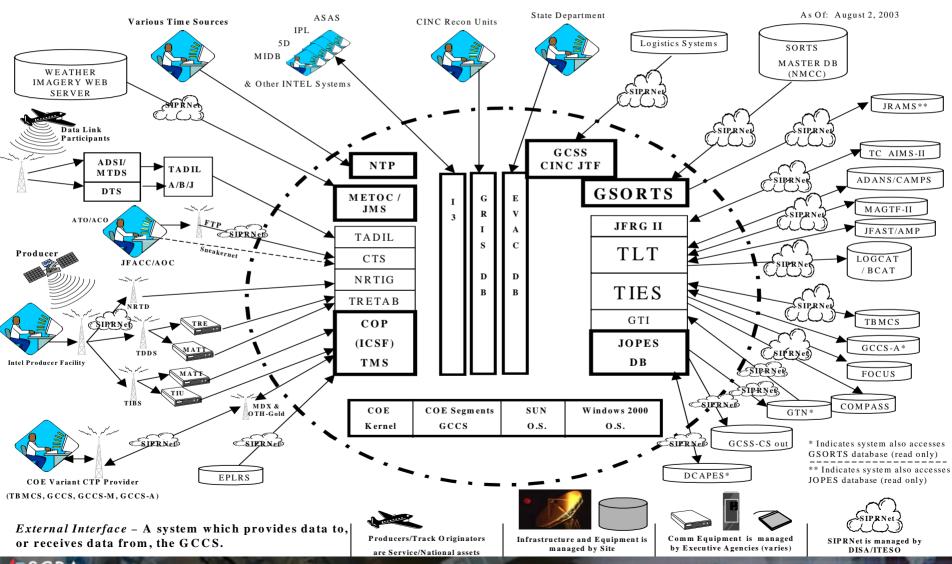


# We get lost in diagrams like this. don't we?

### GCCS-J 4.x External Interface Architecture



# **Basic Doctrinal Requirements**

DoD's responsibility is the management of <u>violence</u>.

# **Principles of War**



Clearly defined, decisive and attainable objective. Each operation must contribute to the ultimate strategic aim. ...

#### Offensive

Seize, retain, & exploit the common objectives. Means to maintain freedom of action & achieve decisive results.

#### Mass

Synchronizing all the elements of combat power. Mass the effects not necessarily the forces.

#### Economy of Force

No part of the force should ever be left without a purpose

#### Maneuver

Movement of forces in relation to the enemy to gain positional advantage. Continually pose new problems for the enemy by rendering his actions ineffective & eventually defeating him.





### Unity of Command

For every objective, seek unity of command and unity of effort. Unity of command means that all the forces are under one responsible commander

### Security

Never permit the enemy to acquire unexpected advantage. Protecting the force increases friendly combat power..

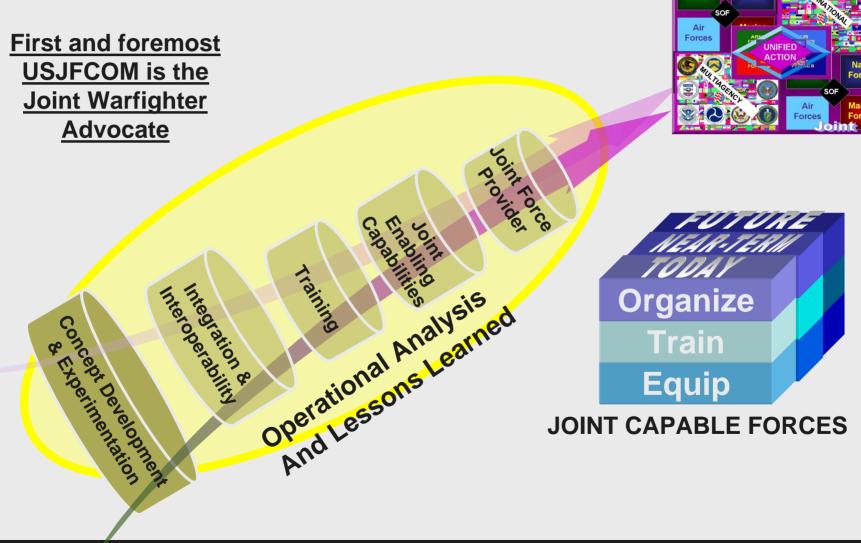
#### Surprise

Strike the enemy at a time or place or in a manner for which he is unprepared

### Simplicity

Prepare clear, uncomplicated plans and concise orders to ensure thorough understanding effectiveness

# What USJFCOM Does to Support the Joint War



# Major Mission Command & Control (C2) Capabilities Areas



#### **FORCE PROJECTION**

Joint Operation Planning & Execution System (JOPES)



#### **FORCE READINESS**

Readiness Assessment System (RAS)

Global Status of Resources and Training System (GSORTS)



#### **FORCE EMPLOYMENT**

Air, Land, and Sea Operations CAS Planning and Execution



ADAPTIVE PLANNING

**EXECUTION** 



**FORCE PROTECTION** 

Early Warning and Integrated Air and Missile Defense



SITUATIONAL AWARENESS

Common Operational Picture (COP)



INTELLIGENCE

Integrated Imagery Intel (I3)



Program Decision Memorandum (PDM) III, December 20, 2005, Tasked the Assistant SecDef for Networks & Information Integration / DoD Chief Information Officer (ASD(NII) / DoD CIO....

"To accelerate the provisioning & adoption of Core Enterprise Services (CES) across DoD.

In commercial industry speak, that means to start developing a System Oriented Architecture (SOA) approach for C2.

# Perspective

The DoD must continue to evaluate/assess technology's impact on the current war. And quickly adopt approaches that increase our combat capabilities

- Emerging technologies, like SOA and innovative CONOPS must accelerate, together
- Viable technologies must be rapidly integrated into current C2 practices, allied operations, training, and doctrine for maximum effectiveness
- Warfighter needs are dynamic, our coalition arrangements are unique, and the "fundingrequirement-acquisition" process is unacceptable in the 'immediate' for the soldier on the patrol







We believe that Net-Centric Environment "e.g. SOA approach" is the next principal mechanism for enhanced Command Capability of Joint C2.

### Changing Business Model

Where we are		Where we need to be
Familiar		Less familiar
What we use	FOCUS	What we use and how we use it
Technology affects on system capability	SOLUTION	Technology + method + people affect on operational capability
Developers' perspective	PERSPECTIVES	Warfighter perspective
Hardware and software must be developed together	CENTRAL RULE or CONCEPT	Materiel and non-materiel must be developed together
SoS assessment - OT&E focus on the system	APPROACH	MCP assessment - Holistic focus on all components
System centric	CENTRICITY	Capability centric (Warrior)

Focus on Joint
Warfighter's urgent
operational need -solution providers must
forge a single
'integrated' enterprise
to reduce risk in
satisfaction of that
need.

### Changing the Business Model Requires:

- (1) Willingness to work together to leverage each others core competencies
- (2) Focus on Joint Warfighter as central driver solution need originator and evaluator
- (3) Commitment to providing meaningful services rather than inflexible "products"

# Poland's Case Study

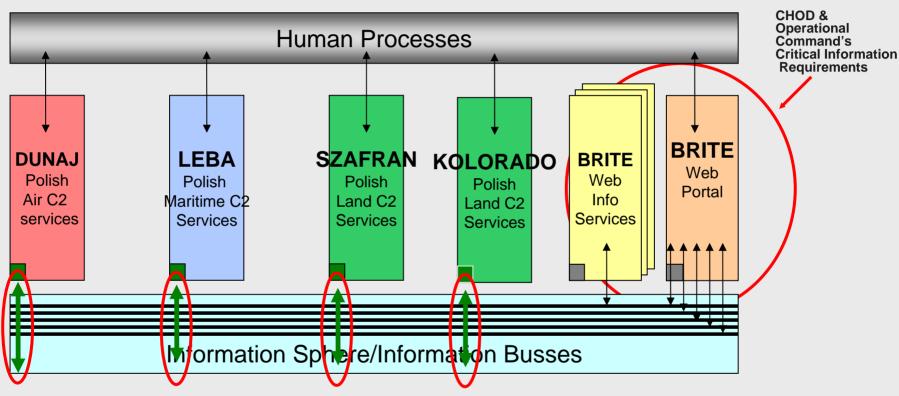
#### TRANSFORMATION EFFORTS:

- Moving away from a Soviet based system
- Moving to a professional as apposed to a conscript based force
- Moving to a capitalistic based economic model
- Moving to asymmetric warfare
- Moving to a net-centric combat capable force



- At the request of Poland's Chief of Defense (CHOD), a combined NATO and USJFCOM, Poland's Military staff, plus Industry and Academia constructed a near term Common Operating Picture (COP).
- Constructed a near term SOA environment to integrate Poland's Air, Land and Sea into a combined Common Operational Picture.
- Supported Poland's role as a NATO member & US strategic partner

# Poland's Case Study



**BRITE** interface incorporated in every system

Automatic discovery add-ons

Iterative nentation

**BRITE** = Baseline for Rapid Iterative Transformational Experimentation

### **DoD's Web Services Characteristic**





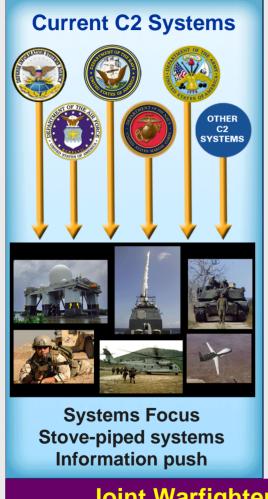
Support
Enterprise-based
Joint
Architecture

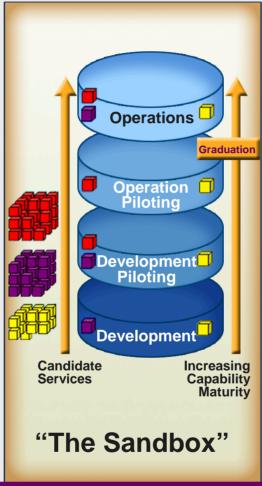
Sustained by Global Information Grid Enterprise
Services and Net-Centric Enterprise Services

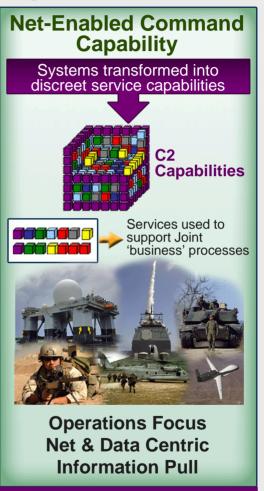
These web systems and services will have a unique combination of characteristics that differentiate them from more conventional legacy client server applications. In particular, they tend to include:

- Architecture places data at the center of its design: Enterprise Resource Pattern (ERP) & Enterprise Service Bus (ESB)
- ERP standardizes access to any C2 domain object (APIs)
- ESB publishes messages based on an event/trigger
- Rapidly changing technologies, e.g. more actors, platforms, networks, and services not applications

# Joint Capability of Net-Enabled Command Capability (NECC)



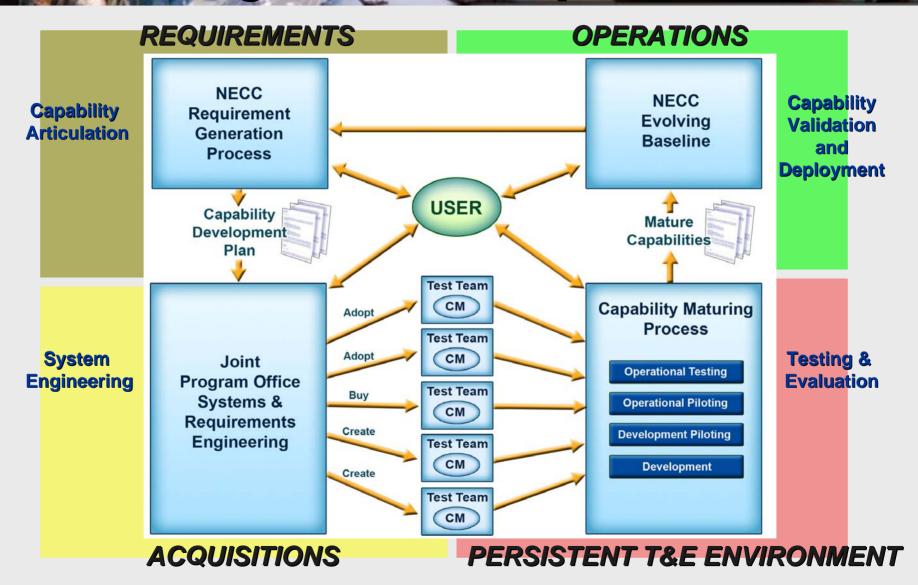




**Joint Warfighters Command and Control Need Driven** 

With the net centric approach, user engagement occurs in the "sandbox" during the combined evaluation referred to as the "piloting" events.

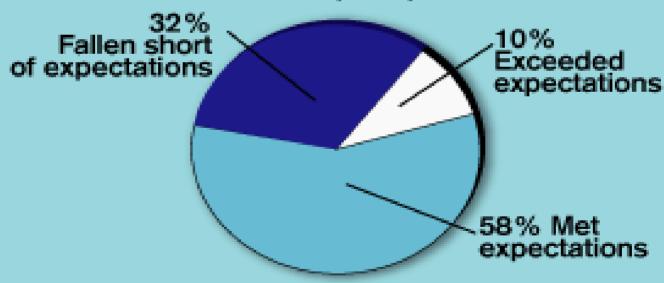
## Integrated Enterprise Process



### **Industries Mixed Results**

### Mixed Results

How has your company's SOA/Web services adoption performed?



Data: InformationWeek Research SOA/Web services survey of 278 business technology professionals; 229 companies using SOA/Web services

### **David Linthicum**



### Top 5 Mistakes w/ SOA,

- 1. Not enough trained IT/SOA architects to put on the problem.
- 2. "Manage by Magazine" approach to SOA.
- 3. Don't understand the unique nature of their problem domains.
- 4. Treat SOA as a project, not a journey.
- 5. Unable to define the value.



Oh, by the way: David said, "I Actively tracks 120 different SOA standards 20% to 30% are duplicative At any one point in time."

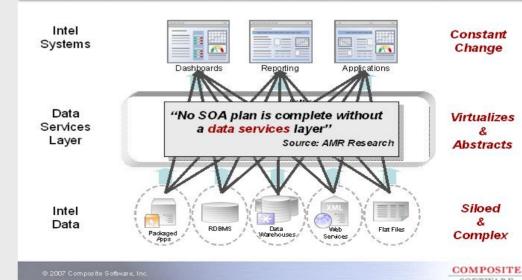
### Jim Green,



Designing Reusable Software,

- Types of services:
- (1) put data in, (2) get data out
- SOA & error handling => careful planning

#### IT's Challenge - Deliver the Data with Flexibility & Agility





### Hub Vandervoort, CTO, Progress/Sonic

His Key concept was Enterprise Service Bus (ESB)
Service Requires alignment across 4 dimensions
Functional, (2) Structural (3) Behavioral (4) Performance
Interaction Model (-Request Reply, -Store & Forward, Pub/Sub, -Bulk transfers)



### Steve Kahn, Bearing Point

- Discussed two SOA projects (Insurance Company & Commercial packaging firm)
- Focus on the business..., technology is never enough.

#### Some Final Thoughts



- SOA Maturity
  - Incremental approaches work best
  - Expect to get smarter along the way
- Business Process Management and SOA
  - BPM is the ultimate enabler of return on SOA investment
  - BPM is to SOA what a conductor is to an orchestra
  - Business processes are built from high-level composite services
  - Invoke business processes as services
- Knock down remaining impediments
- Maintain Leadership Support

SOA Case Studies

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INTEGRATION SOLUTIONS

Booz | Allen | Hamilton

### Melissa Soley, BAH, Trans-National COP

BAH Mission Engineering (ME) method is a bottom-up IER data capture approach

Very intensive data capture approach

Point of interest: 80% of an Intel Analyst's time is spent simply retrieving data not analyzing.

#### High Level Operational Architecture TACTICAL/OPERATIONAL OPERATIONAL/STRATEGIC QUADRANT QUADRANT • Intell Architecture Integration DCGS JCD/CON OPS Development System Development Compliancy · COALITION IPT Support · Program of Record Alignment DD TE Implementation Benefits Ability to Standardize/Impact DCR · DCR Development Harmony Common Services Framework (SOA) Materiel Solutions JIOC Maturation Process NCES V Informs, Empowers. Shapes, Aligns

### **AMBERPOINT**

#### Sean Fitts, Amber Point

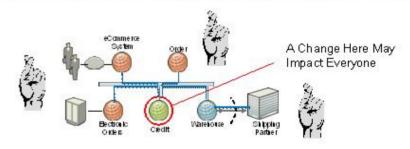
Keys to SOA Runtime Gov'n

Visibility => what is going on & who is using it?

Control => Actions to prevent or correct issues

Integrity => Ensuring changes don't impact the whole infrastructure

The SOA Validation Problem
Business System Integrity Always at Risk



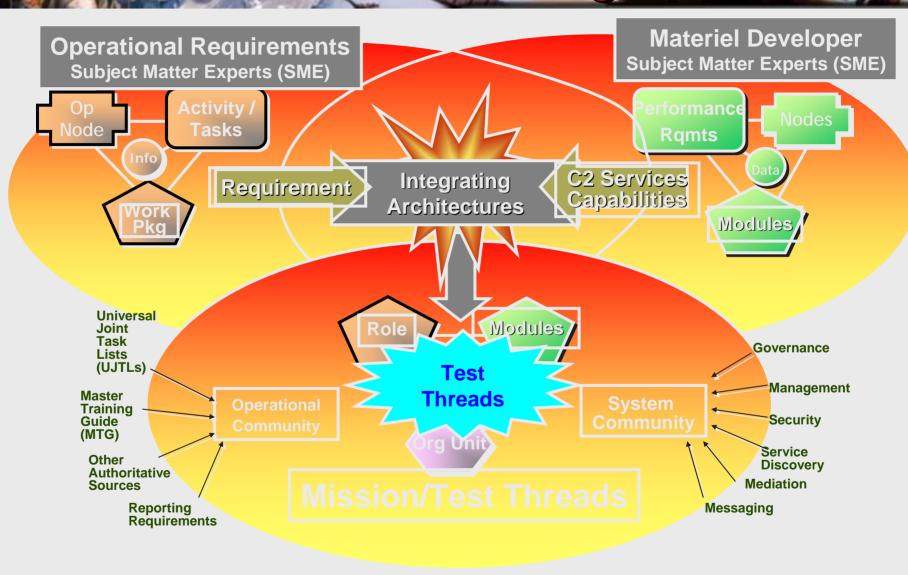
- Service reuse creates dependencies
- Impact of any changes ripple throughout the system.
  - Real impact of planned changes is hard to predict.
  - Impact of unplanned or unannounced changes can be devastating
- Yet, it quickly becomes impossible to setup and replicate all dependent systems for testing elsewhere

Need way to continuously check for integrity – both in staging and in production

AMBERPOINT



### What is our Testing Approach?



# Testing CONOPS in DoD's Net-Centric Environment

### So what did he say?

THE STATES OF MILES

- DoD's C2 environment has @ 7 million customers
- Our business is the management of violence
- JFCOM is the Joint Warfighter Advocate
- DoD is moving to Net Centric C2
- DoD will continue to adapt to change

- Poland's military transformation & movement toward Net Centricity
- NECC programmatic processes
- Industries views
- NECC testing concept
- DoD is in the early stages of SOA adoption

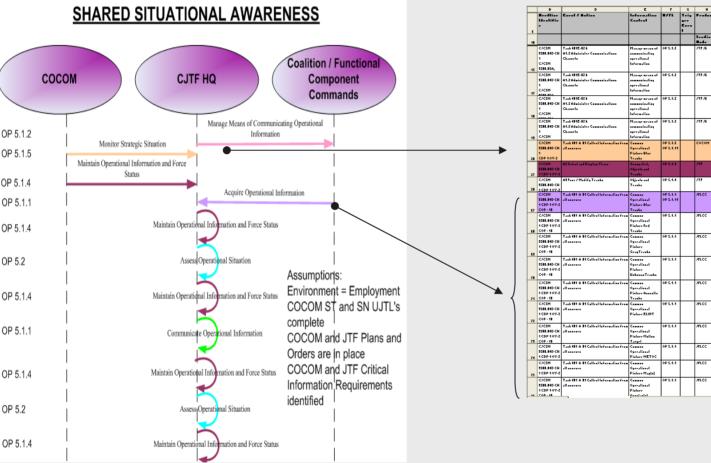


### **BACKUP SLIDES**



### What is our Approach?

### Use an Operational Mission Thread Concept



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**Operational Event Trace Description (OV-6c)** 

**Event Table**