



Joint Warfare System (JWARS)

Update to the Executive Forum on Modeling and Simulation

May 30, 2001

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Web Site: <https://www.jointmodels.mil/jwars>

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Agenda

- **Background**
- **Management**
- **Technical Overview**
- **Schedule**



History

Calendar Year

1995

1996

1997

1998

1999

JWARS Operational Requirements Document (ORD) was approved by Joint Requirements Oversight Council (JROC).

DepSecDef designated Joint Data Support (JDS) as primary data support agency for JAMIP.

Deputy Secretary of Defense (DepSecDef) initiated Joint Warfare System (JWARS) development as one component of Joint Analytic Model Improvement Program (JAMIP).

Prototype
Development

Production
Development



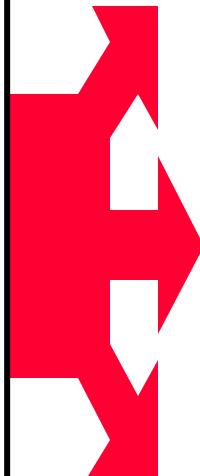
Mission

Mission: Develop a state-of-the-art, constructive simulation that will:

- *Provide a multi-sided and balanced representation of joint theater warfare*
- *Be able to assess current and future operational concepts to include Joint Vision 2010's:*
 - Dominant Maneuver, Precision Engagement, Focused Logistics, and Full-Dimension Protection
- *Use C4 and ISR as the foundation for how entities perceive and interact with one another*

Users

- Joint Staff
- Services
- CINCs
- OSD
- Joint Task Forces
- Other DoD org's
- Industry



Applications

1. Force assessment
2. Planning and execution
 - *Deliberate planning*
 - *Crisis action planning*
3. System effectiveness and trade off analysis
4. Concept and doctrine development and assessment



Requirements - Warfare Functionality

(slide 1 of 2)

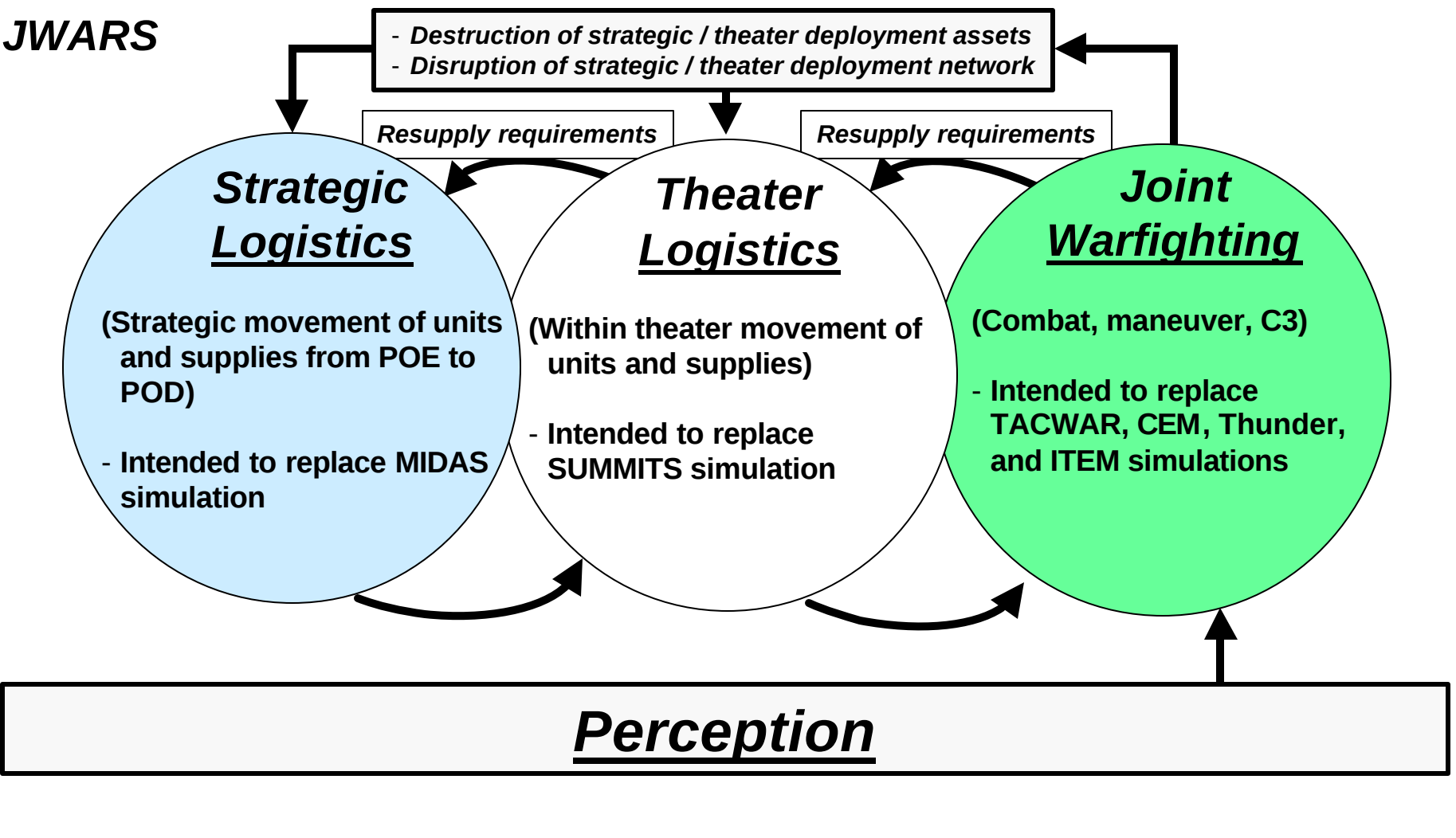
- **Release 1 (Limited IOC)**
 - Include C4, ISR, logistics, and essential functionality in legacy simulations TACWAR and MIDAS.
 - Be capable of replacing TACWAR for force assessment application.
- **Release 2 (Full IOC)**
 - Provide balanced warfare representation, including C4, ISR, logistics.
 - Be capable of supporting the applications--
 1. Force assessment.
 2. Planning and execution.
 - Be capable of replacing TACWAR and MIDAS.
- **Release 3 (FOC)**
 - Provide balanced warfare representation, including C4, ISR, logistics.
 - Be capable of supporting the applications--
 1. Force assessment.
 2. Planning and execution.
 3. System effectiveness and trade-off analysis.
 4. Concept and doctrine development and assessment.
 - Be capable of replacing legacy simulations CEM, Thunder, ITEM, and SUMMITS.



Requirements - Warfare Functionality

(slide 2 of 2)

JWARS



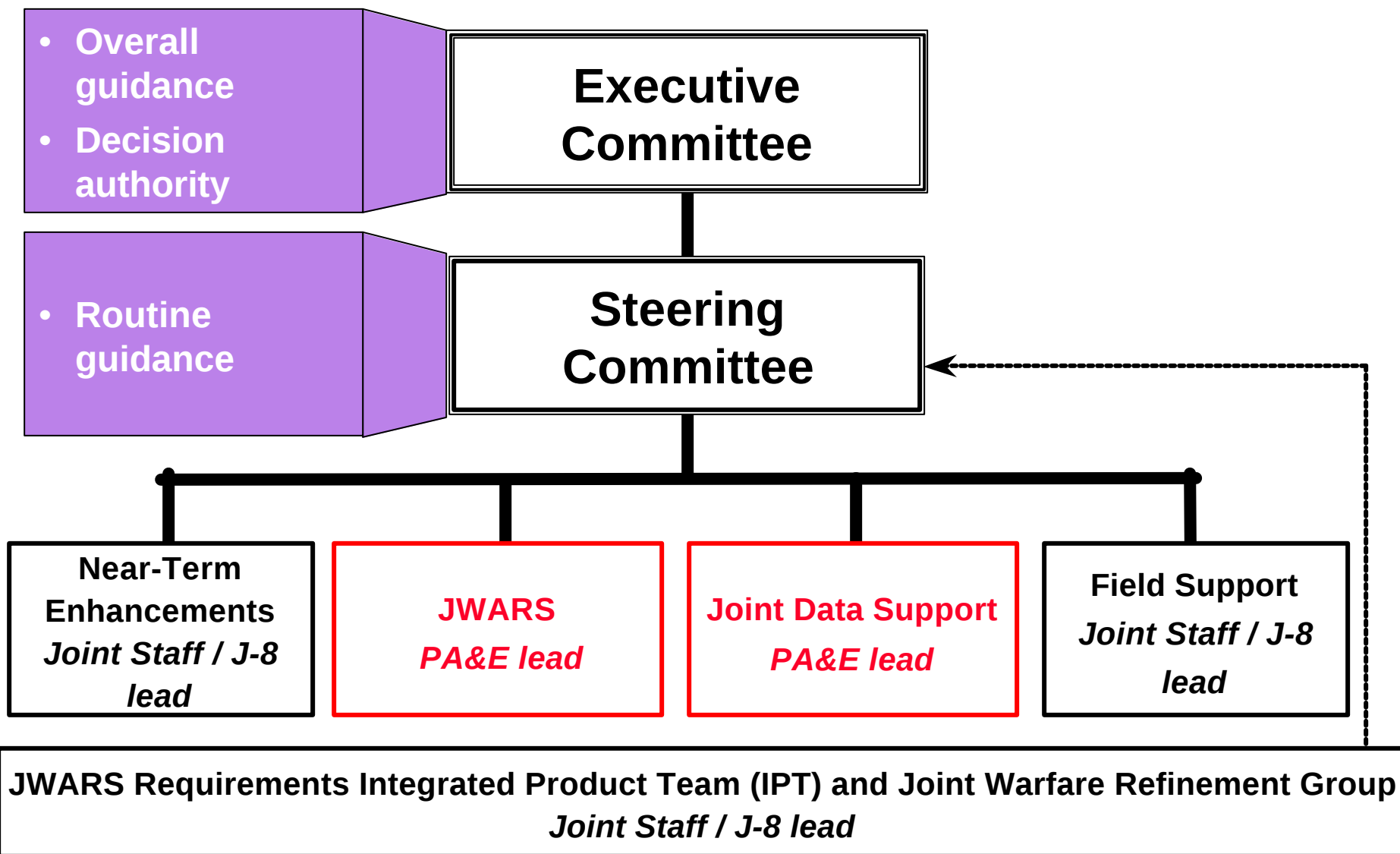


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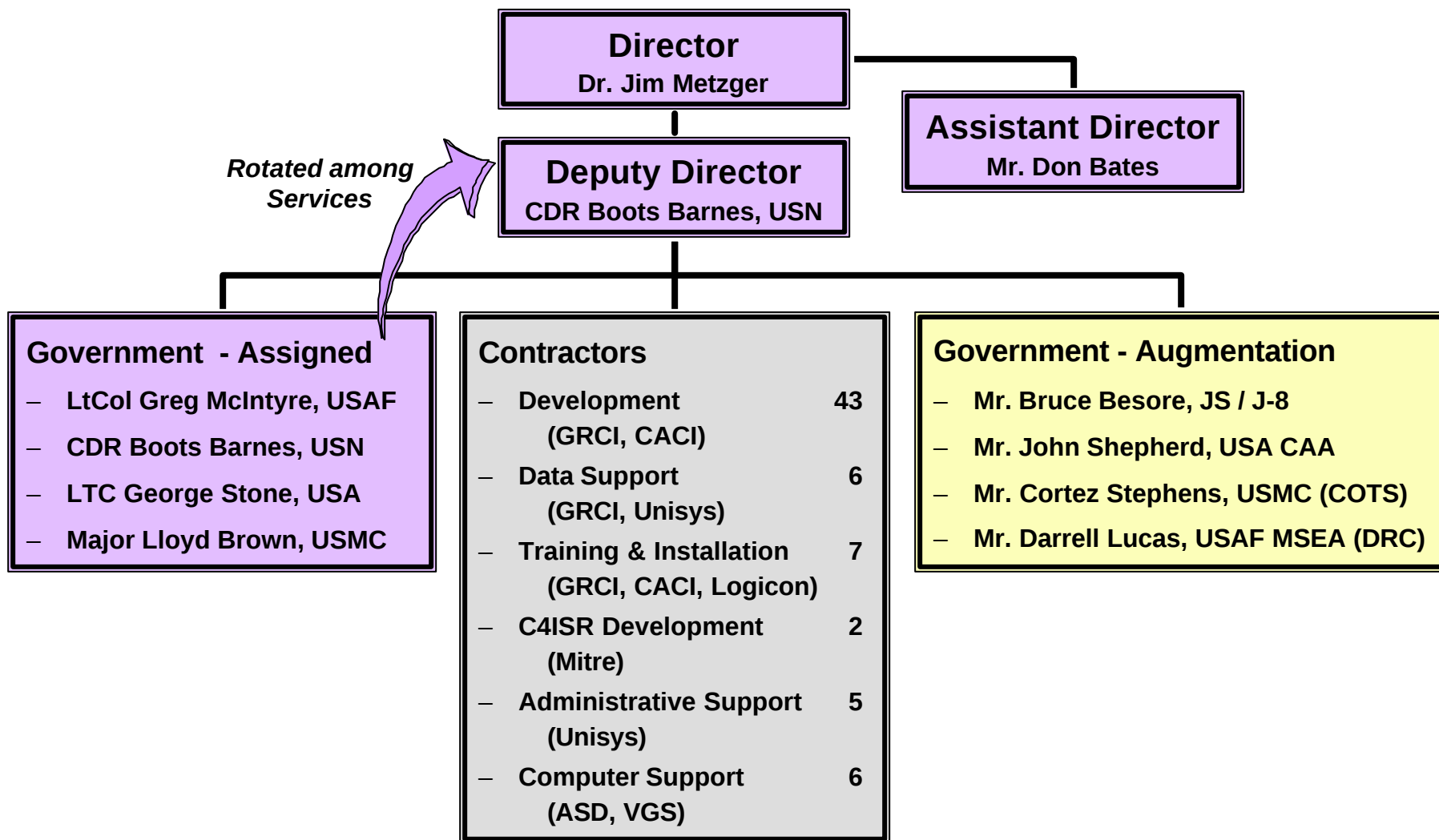
JAMIP Management





JWARS Office

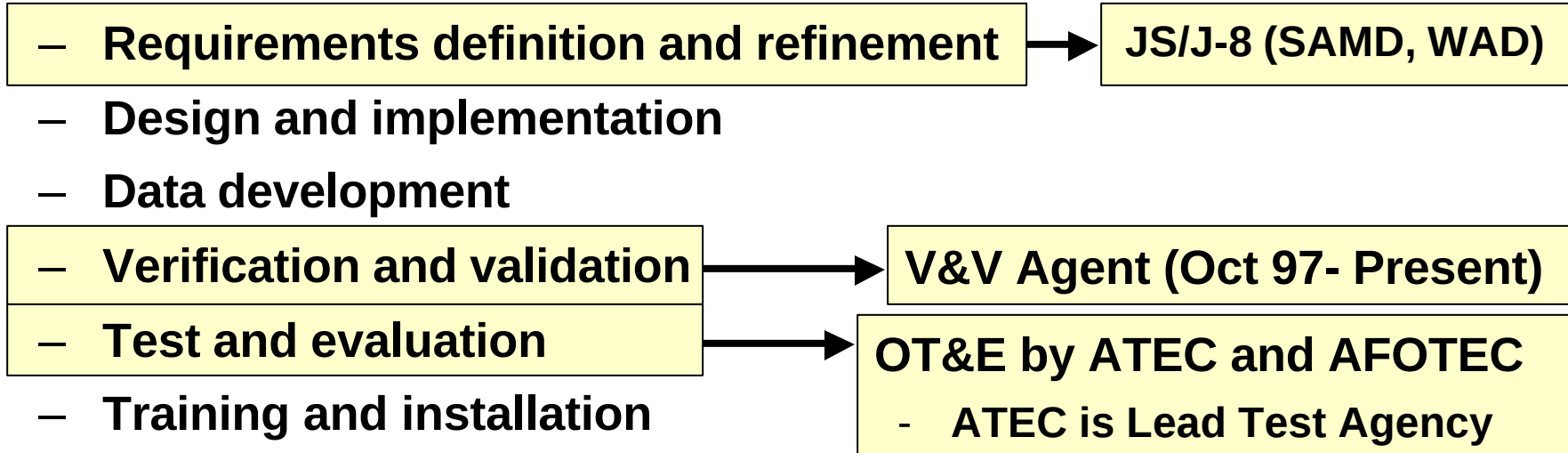
Integrated Government-Contractor Facility (Arlington, VA)



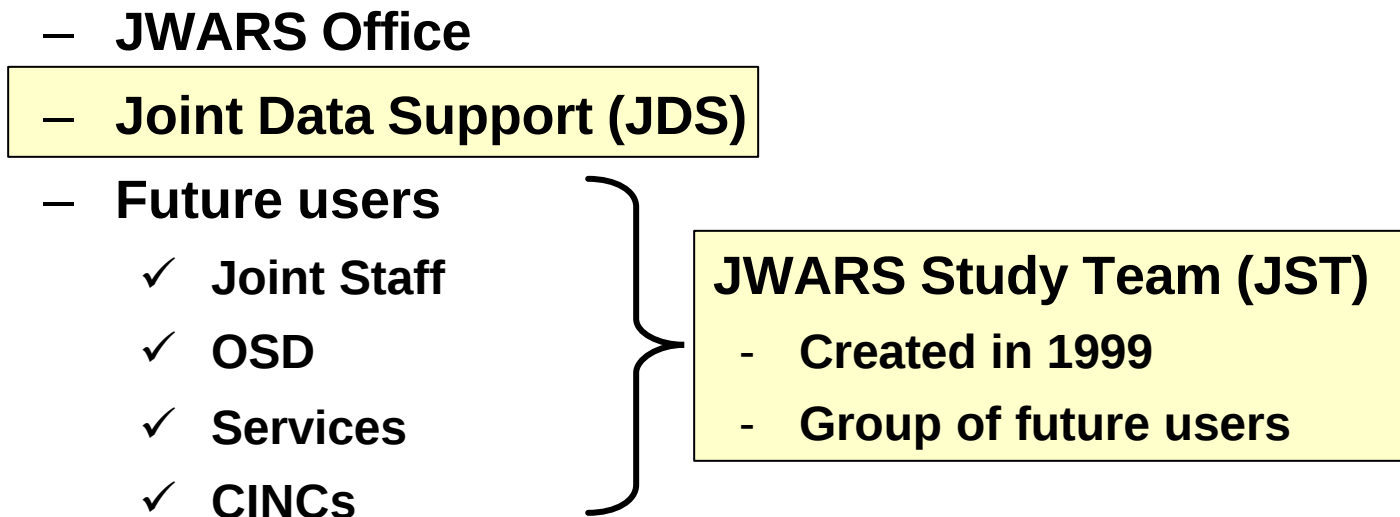


Collaborative Development Process

• Activities

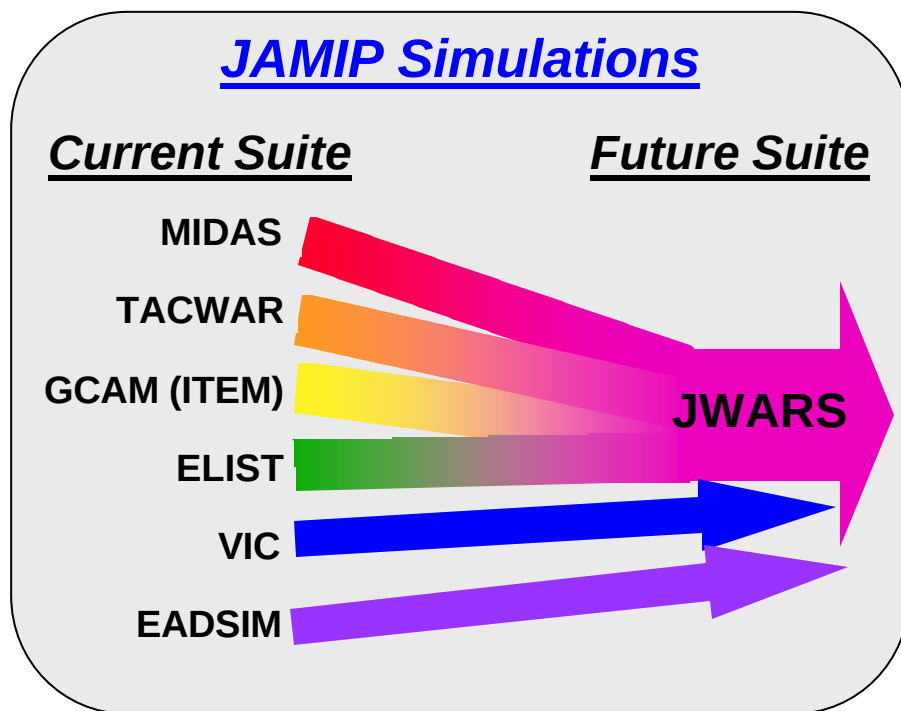


• Participants



Charter: Improve the Quality and Consistency of DoD Analyses

- Provide and manage data for DoD analytical studies
 - *Broad customer base (Joint Staff, Services, CinCs, OSD)*
 - *Supporting*
 - Studies using JAMIP simulations (e.g., MRS-05)
 - Studies using other decision support processes (e.g., Dynamic Commitment)
- *Support JWARS development and fielding*





JWARS V&V and T&E

Verification and Validation (V&V)

- **Activities (described later) performed during development by JWARS V&V Agent, users, and subject matter experts**
- **Documented by JWARS V&V Agent**

Test and Evaluation (T&E)

- **Developer testing - by development contractor for JWARS Office**
 - *During development*
 - *Prior to each release*
- **External testing - by selected user sites, at each of Limited IOC, Full IOC, and FOC.**
 - *Beta testing*
 - *Operational Test and Evaluation (OT&E)*



Release 1 Test and Evaluation

Objective

- Ensure that ORD requirements are satisfied

Process

- Installation and training for user test sites
- Beta testing by user test sites
- Operational testing by user test sites, overseen by Services' Operational Test Agencies (Army lead)

Participating user sites

ODPA&E (SAC)	JS (J-8)	USAF (AFSAA)	USA (CAA)
USN (N81)	USMC (MCCDC)	USCENTCOM	USSOCOM
USTRANSCOM	USPACOM	USFK	



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JWARS Architecture - System View

JWARS

HCI System

Human Computer Interface (HCI)

- Provides interface to analyst
- Permits study set up, initiation of simulation, and processing of output data

JACS

JWARS Admin Control System (JACS)

- Associates analyst computer to server processors
- Initiates runs

Simulation System

Simulation

- Performs simulation runs

Synthetic Natural Environment (SNE) System

SNE System

- Provides environmental information

External Access

Oracle Database

Database serves several roles

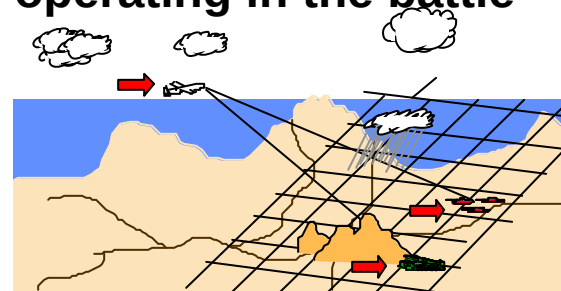
- (Now) Contains input data (data already read plus data generated through HCI), stored in Oracle Binary Large Objects (“BLOBs”)
- (Now) Stores output data generated during execution, for subsequent postprocessing.
- (Near future) Will contain input RDBMS, to replace flat files for “read” data.



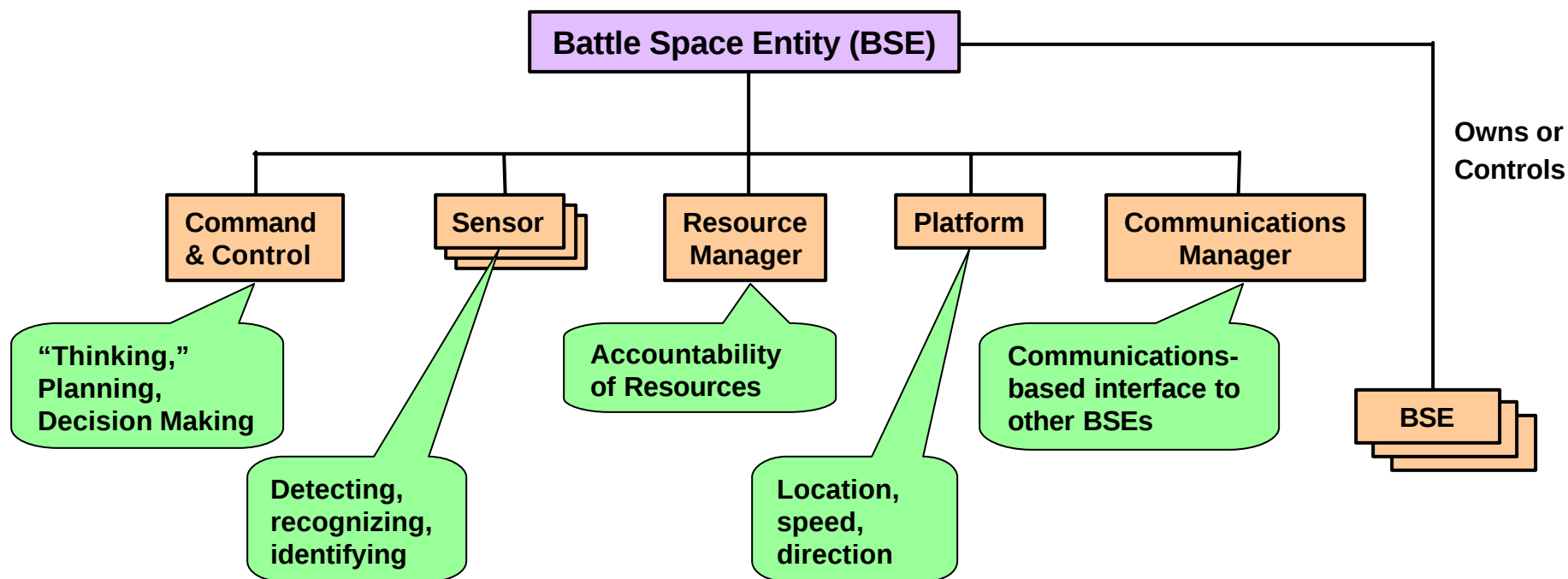
Fundamental Component -- Battle Space Entity (BSE)

- BSE -- a friendly unit, enemy unit, or major system operating in the battle space. Examples:

- Operational Headquarters
- Strategic aircraft and ships
- Airbases and seaports
- Land: Maneuver Battalion
- Air: Air Mission Element
- Space: Sensor Satellite
- Maritime: Ship, Submarine



- Represented as a “composite software object.” Top-level decomposition:





Release 1 Warfare Functionality - Summary

JWARS

- Destruction of strategic deployment assets
- Disruption of strategic deployment network

Strategic Logistics

(Strategic movement of units and supplies from POE to POD)

- Strategic network
 - Airlift and Sealift deployment
- Installations (APODs/SPODs)
 - Chem effects and adjudication
 - Graduated Throughput recovery
- Scheduling based on a TPFDD
 - Mode & route selection

Theater Logistics

(Movement of units and supplies)

- Theater arc-node network
 - User defined network resolution
 - Movement constrained by capacity
- Multi-modal transportation
- Sustainment planner (Maritime)
- Installations (HE effects)
 - Air to ground adjudication
 - Facility damage

Resupply requirements

Joint Warfighting

(Combat, maneuver, C3)

- Air, land, and sea C3
- Air, land, and sea operations (-)
- Chemical defensive operations
- Naval blockade
- Detailed Air Tasking Order
- Forcible entry operations
- Theater Missile Defense

Perception

- Provide intelligence information

- Assess operational situation



Release 1.3 Warfare Functionality - Summary

Major module	Functionality	Release 1.3 content
Strat. Deployment	Strategic flow from POE to POD	simulated in playbox only
	Strategic network	Ö
	Air and sea PODs	basic ¹
Theater Trans & Logistics	Integrate units into theater	Ö
	Intratheater network	Ö
	Logistics distribution	yet to be implemented
Perception	Provide intelligence information	Ö
	Assess operational situation	Ö
	Communicate	Ö
Operations	Command and control	Ö (theater, land, air, maritime)
	Air Tasking Order	Ö ²
	Interdiction and counter air	basic ²
	Maritime warfare	SUW, USW, blockade ³
	Land warfare	basic ⁴
	Firepower and close air support	Ö
	Theater ballistic missile defense	basic ²
	Suppression of enemy air defense	yet to be implemented
	Chemical defense	Ö
	Forcible entry	Ö

Notes: 1. More detailed representations of APOD and SPOD operations will be incorporated in Release 2.

2. Representations of Integrated Aerospace Defense and Airspace Control remain to be incorporated in Release 2.

3. Countermine operations remain to be incorporated in Release 2.

4. Mobility/counter mobility operations remain to be incorporated in Release 2.



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Macro Schedule

Calendar Year

2000

2001

2002

2003

2004

Release 1

**Enhancement, Integration, Developer
Testing**

Early User Testing
JWARS Study Team

**Familiar-
ization**

**Beta
Test**

OT&E

12 Beta Test Sites

Release 2

Release 3



Near Term Schedule

- **Release 1.3**
 - Developer Testing completed in April 2001
 - Training and Installation began in May 2001
 - Distribution to requesting Beta Test sites for familiarization
- **Release 1.4**
 - Will include warfare functionality of Limited IOC
 - Completion date: *to be determined* date in 2002
 - Affected by possible assessments by JWARS Study Team
 - Distribution to Beta Test sites for Beta Testing
- **Release 1.5**
 - Will include changes resulting from Beta Testing
 - Estimated date: *to be determined* date, dependent on Release 1.4
 - Distribution to Beta Test sites for OT&E



JWARS Payoff - Improved Analytic Support

JWARS

- Constructive simulation of joint theater-level warfare
- Balanced
- C4 and ISR foundation

Users

- Joint Staff
- Services
- CINCs
- OSD
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- Other DoD organizations
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Applications

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