In response to questions about his proposed budget and transformation efforts, he prefers to think of change less in terms of dollars and cents than in processes and linkages:

“It can be simply in connectivity,” he said. “It can be in interoperability. It can be in taking things that every single one of which exists presently and managing them, using them, connecting them, arraying them in a way that has a result that is transformational.”

-- Secretary Rumsfeld
Outline

- Why are we here?
  - State of Interoperability in the Department

- What are we doing about it?
  - Overarching Initiatives
    - Family of Interoperable Operational Pictures (FIOP)
    - Single Integrated Air Picture (SIAP)
    - Single Integrated Ground Picture (SIGP)
    - Shared Tactical Ground Picture (STGP)
    - Precision Engagement/Time Sensitive Targeting (PE/TST)
    - Combat Identification (CID)
  - Future Vision
    - System of Systems (SoS)
IO - Interoperability Programs

- Key Overarching Initiatives
  - Family of Interoperable Operational Pictures (FIOP)
  - Single Integrated Air Picture (SIAP)
  - Precision Engagement / Time Sensitive Targeting (PE/TST)
  - Combat Identification (CID)

- Policies and Processes
  - Building Systems of Systems Capabilities
    (Key Role of Systems Engineering and Simulation)
  - Architectures
    (Operational, Systems, Technical, emphasis on Open Systems)
What is Interoperability?

“Ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.”

(JCS Pub 1)

- Interoperability today is a **critical problem in joint force & combined operations** -- CINC’s top issue

- **Getting worse, not better**, as new coalition partners develop, complex systems are acquired, and “fixes” to past problems are applied in stove-piped fashion

- **Joint Vision 2020** calls for increasingly **network centric warfare**, dependent upon fully interoperable systems
Four major components are needed to address interoperability

We are less than half way there . . .

- **DOCTRINE, CONCEPTS, TRAINING, TTPs (Demo, Exercise, etc.)**
- **POLICIES AND DIRECTIVES**
- **STANDARDS & ARCHITECTURES (JOA, JSA, JTA, GIG)**
- **OVERARCHING BMC2 PROGRAM INITIATIVES (FIOP, JI&I, JDEP)**
- **NEW & ENHANCED LEGACY SYSTEMS (JSF, JTRS, SBIRS, MOBILE COMMAND CENTER)**
- **PHASEOUT LEGACY**

**Interoperability**

**2000** **2001** **2003** **2005** **2008**

- **Policy Mods and Transition Plans In Place**
- **Overarching BM/C2 Initiatives Begin to Take Effect**
- **“Low Hanging Fruit” I/O problems solved for legacy C2 systems**
- **Legacy C2 I/O problems resolved; I/O institutionalized in processes, arch, etc.**

**REQUIRED INTEROPERABILITY (SCENARIO DEPENDENT)**

**100%**

**Without Overarching BM/C2 Program Initiatives**
Today’s Problem

**As of Jun 00**

Inadequate interoperability = fratricide, leakers, lack of effectiveness

**USER/CONCEPT**

CINC Operational-level “pics”

JTF Tactical-level “pictures”

Firing Aerospace, Ground, Maritime “pictures”

**CORRESPONDING SYSTEMS: “As-Is / As Planned”**

*The cause*: multiple systems, conceived and developed individually

Compounding the problem: systems, TTP, missions changing continuously, new coalition partners, stovepiped intelligence dissemination
But systems, TTP, and missions with coalition partners change continuously!

Therefore...

Information sharing approach needs to be highly flexible!

CINC EUCOM footnote
Balance flexibility for the JFCs to configure pictures with a “preferred” option.
Needed horizontal and vertical system interoperability across Service lines and between echelons.

The Solution: A Conceptual View of FIOP as Glue

“TO BE”: Family of Interoperable Operational “Pictures”

FIOP Glue:
- Federating Data Strategy “Information”
- Fusion Strategy
- Multi-Level Security Architecture
- Direction Vector for Relevant Department Initiatives
Service Led FIOC

- SENIOR BUT LEAN
  ORGANIZATION

FIOP Systems Engineer
(Service Lead)
USA/USMC/USN/USAF
Warfighters/Engineers

- BULK OF NEW $$ MIPR’d
  TO SERVICE EFFORTS

JFCOM
JI&I

Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities
(DOTMLPF)

JROC (COP)
FIOP Task 1
(AC2ISR Led)

SIAP*
(Navy Led)

SIAP - Single Integrated Air Picture
SIMP - Single Integrated Maritime Picture
SISP - Single Integrated Space Picture

SIMP
(Navy Led)

SIGP
(Army/MC
Led)

SIGP - Single Integrated Ground Picture

SISP
(Air Force
Led)

SISP - Single Integrated Space Picture

CTP

SOFP (SOCOM
Led)

SOFP - Special Operation Force Picture

JROC (COP)
FIOP Task 1
(AC2ISR Led)

Establishment of SE Orgs will be via JROC (no preset timeframe)

Legend:

Joint Distributed Engineering Plant (JDEP)
OUSD AT&L FIOP Tasks

- Ensure FIOP follows spiral acquisition strategy
- Recommend 80% solutions to those known, most pressing problems
- Recommend a lead Service Systems Engineering organizational structure
- Recommend a funding profile
Current State of FIO P

- **Spiral 1 (JROC FIO P):**
  - Task 1.1 – Web Enabled Execution Management
  - Task 1.2 – Tactical COE Workstation
  - Task 1.3 – COE VMF Processing

- **Spiral 2:**
  - Friendly Forces SA
  - Red Force SA
  - Fire Support
  - ISR Management
  - JDN/JPN Integration
  - Infrastructure Services

- **Spiral 3:**
  - TBD
Single Integrated Air Picture (SIAP)
“Today’s Air Picture Problem”

Constant turnover of target designation limits warfighter ability to make decisions.
SIAP is “Leading the Way” for FIOP

SIAP should evolve into a seamless component of the FIOP, SIGP, SIMP, SISp, COP and CTP

SIAP addressed the need for “one track per target,” which will reduce fratricide by reducing operator confusion.
Single Integrated Ground Picture (SIGP)

- Multi-Service Command & Control Flag Officer Steering Committee drafting SIGP CONOPS
- Coalition Partners (5-Powers) interest in common ground picture
Shared Tactical Ground Picture:

“Five Power Quick Win Activities”

- Integration of Multiple Sensors
- Enabling Communications architectures to support the tactical war fighter
- Data combining to support targeting of mobile objects
- Tracking and identification of Friendly Forces
- Leveraging of emerging data sharing technologies
- Technologies for the management and display of data for the STGP
First Order Assessment will support JROC’s Precision Engagement Strategic Topic

Where do we spend our next $1 for capability improvement?

Precision Engagement / Time Sensitive Targeting (PE/TST)

Detect

Locate

Identify

Assess

Execute

Decide
Under Secretary Pete Aldridge’s tasking on:
Precision Engagement /
Time Sensitive Target Integration

• Build on work and recommendations of the Defense Science Board (DSB)

• Continue the ongoing work by the AT&L led Time Sensitive Targeting (TST) group

• Feed into the overall Precision Engagement effort

• Develop a plan of actions and milestones for Precision Targeting, to include TST

• Complete this task by April 2002
Precision Engagement / Time Sensitive Target Integration

- Summer 2001 Defense Science Board (DSB) Study on Precision Targeting completed August 2001
- Under Secretary Pete Aldridge’s 21 Sep 2001 tasking
  - Build on work and recommendations of DSB, continue the ongoing work by the AT&L led TST group, feed into the overall Precision Engagement effort, develop a plan of actions and milestones
- Met with DSB sub-leads, Service and Agency Acquisition and Operational/Requirements POCs, Program Managers and technical representatives.
- Scrubbed recommendations against feasibility, delta cost and schedule, value added to Precision Engagement, PE gaps
- Flag group chose top eight (8) recommendations which have been designated as “PE Package Block 0”
Combat ID

Situational Awareness Target Identification

Equals

Fratricide Reduction and Increased Combat Effectiveness

Products=

- “Don’t shoot me” systems
- Situational awareness systems

plus

• Operational concept for CCID in CAS, MOUT, Mounted-dismounted Ops

Family of Systems

Training

Doctrine Tactics, Techniques & Procedures
Coalition Fratricide Incidents:

- WWII: US air causes 300 UK, Canadian & Polish casualties.
- Desert Storm:
  - USAF A-10 destroys 2 UK Warriors; KIA 9, WIA 11
  - USA M1 shoots UK Infantry wounding 2
  - USAF/Qatari AF drops bombs on Kingdom of Saudi Arabia force; KIA 4
- ASCIET 99 / 00: 8 / 3 Incidents

US Fratricide Incidents:

- From New Georgia Burma to Desert Storm, fratricide rate ranges from 12% to 17%!
- NTC 15%

"Fratricide continues to be a problem!!"

This has been exacerbated by alliances with multi-national forces containing similar equipment as that of potential enemies!

― General Sheehan ―

“I want to take the moral high-ground here and make sure we fix the fratricide/CID problem. We need to do this right!”
Combat Identification (CID)

• A top concern for US/Joint/Coalition Interoperability
  – Many lives have been lost due to failures in CID

• Leading an effort with C3I and Joint Staff to focus on the ground combat element of CID - where we are weakest

• “Joint CID Ground Study” developing systems architecture & companion investment strategy for Army, Navy, Marine Corps, and Air Force CID systems

OSD/AT&L Champion to Implement this initiative
A Vision for Building System of Systems Capability

Today

Sys A
Sys X
Sys B
Sys D
Sys C
Sys Y

System Focus

Mission Focus

Joint Staff
Mission Areas (MA)
“To Be”

- Precision Engagement
- Deployment/Redeployment
- Dominant Maneuver
- Strategic Deterrence
- Overseas Presence & Force Projection
- Special Operations
  - Joint C2
- Focused Logistics
- Information Superiority
- Multinational Ops & Interagency Coordination
- Full Dimensional Protection

Loosely Federated

Joint C2

Tightly Federated

PMs Highlight Mission Area Impacts @ DABs

AT&L / JS “Mission Area Reviews”
Conclusion

• Interoperability is Effective Joint and Combined Operations

• Need to build mission area system of systems capabilities

• FIO P is Key to Implementing Decision Superiority

• Efforts must evolve in Cooperation with Allies and Coalition Partners, especially for CID

• Systems Engineering and Systems Architectures required to ensure transformation

• Must Harness and Adapt Commercial IT Technology and Processes, with emphasis on open systems
Questions ?