



Aerospace Command and Control & Intelligence, Reconnaissance and Surveillance Center

Garry Barringer, SES
Aerospace C2 & ISR Center
Technical Director

UNCLASSIFIED



Purpose



Provide an overview of the AC2ISRC and top projects



Overview



- **Mission and Organization**
- **Priorities**
- **Challenges**



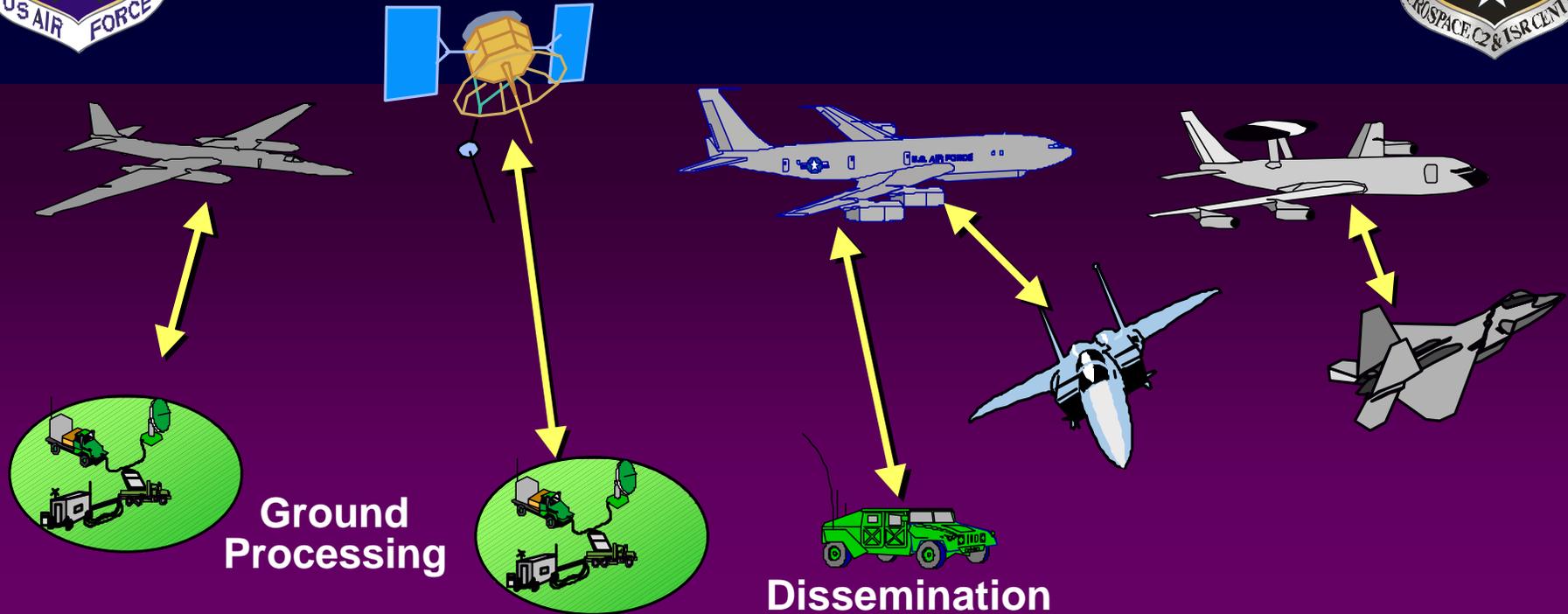
Overview



- **Mission and Organization**
- **Priorities**
- **Challenges**



Today's Operational Reality



- Individual stove-pipe systems
- Lack of bandwidth
- Labor intensive collection / coord
- Difficult to build recognized operational picture

- Little interoperability
- Large forward footprint
- Non-standard C2 centers
- Scattered snapshots of the battlespace

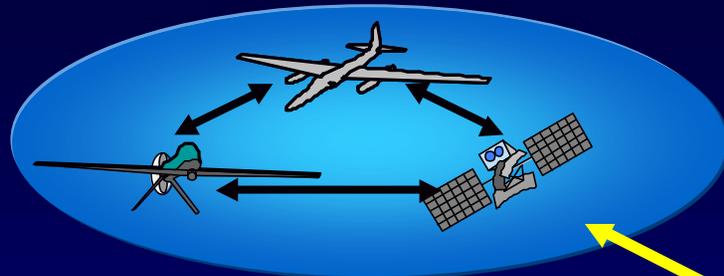
“Data Overloaded, Information Starved” -- SAB



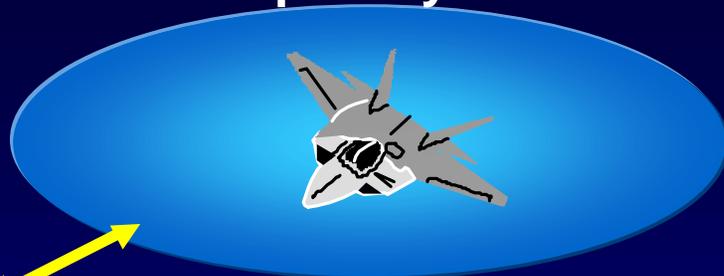
Future C2ISR Operations



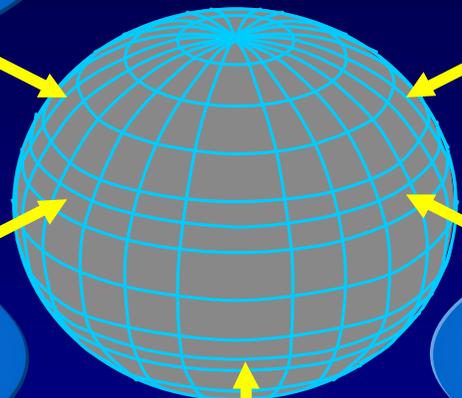
Sensors



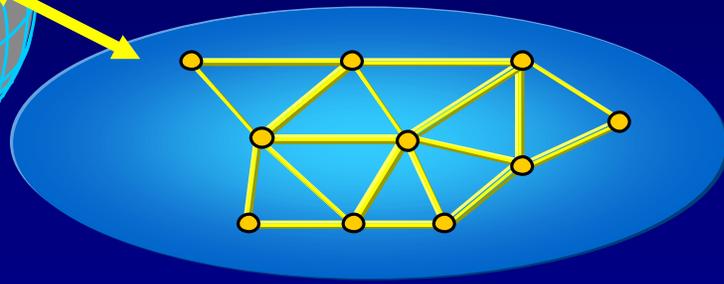
Weapon Systems



Global Grid



Processing & Exploitation Centers



C2 Centers



Aerospace Warriors

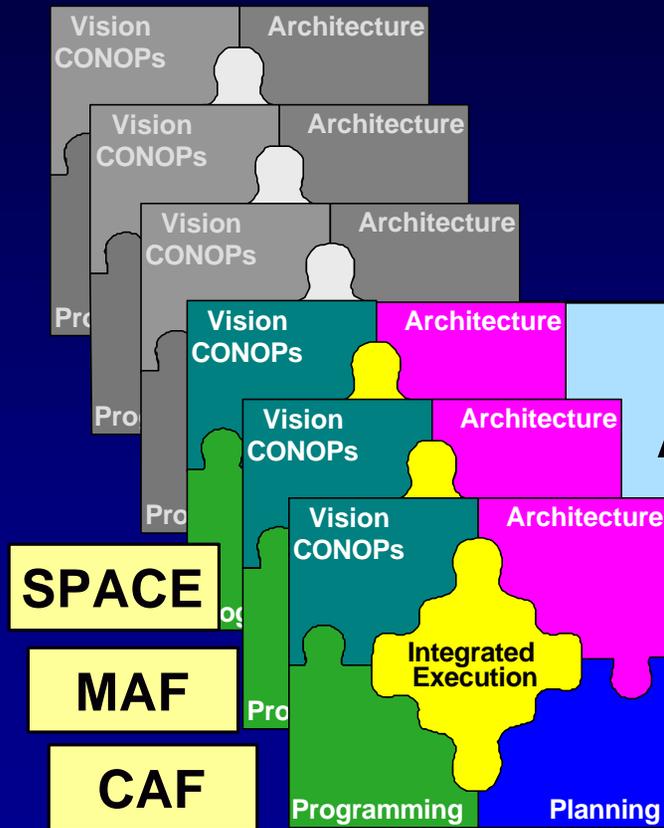


Integrated C2 Requirement

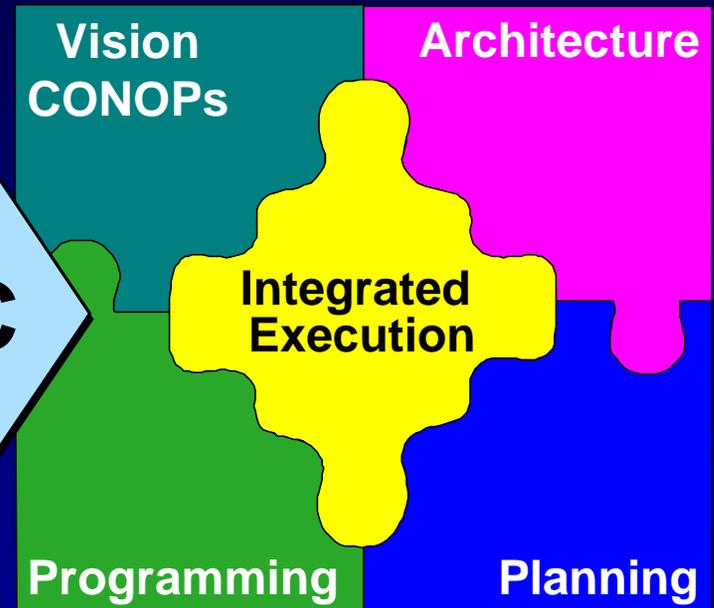
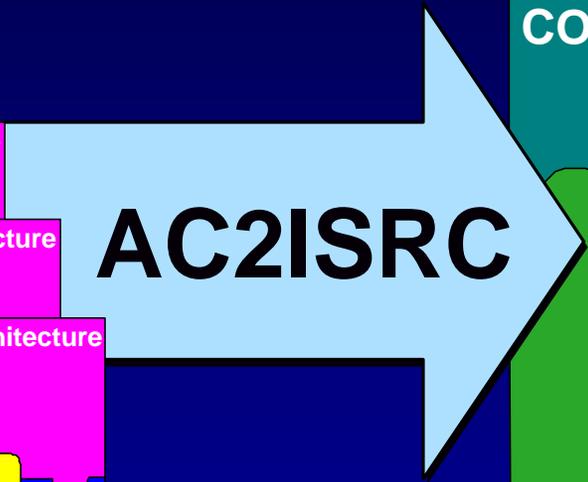


Today

Future



Independent Enterprises



Cohesive Enterprise-Wide View



Mission



Lead organization to integrate and influence Air Force Command and Control & Intelligence, Surveillance, and Reconnaissance Primary tasks:

- Modernization planning
- C2 & ISR operational requirements
- Resource prioritization
- Configuration control
- AF experimentation

*AC2ISRC Charter
signed by CSAF - 4 Dec 98*

Ensure Air Force C2 & ISR Meets the Challenges of Global Engagement, Joint Vision 2010 and Beyond



Joint Relationships

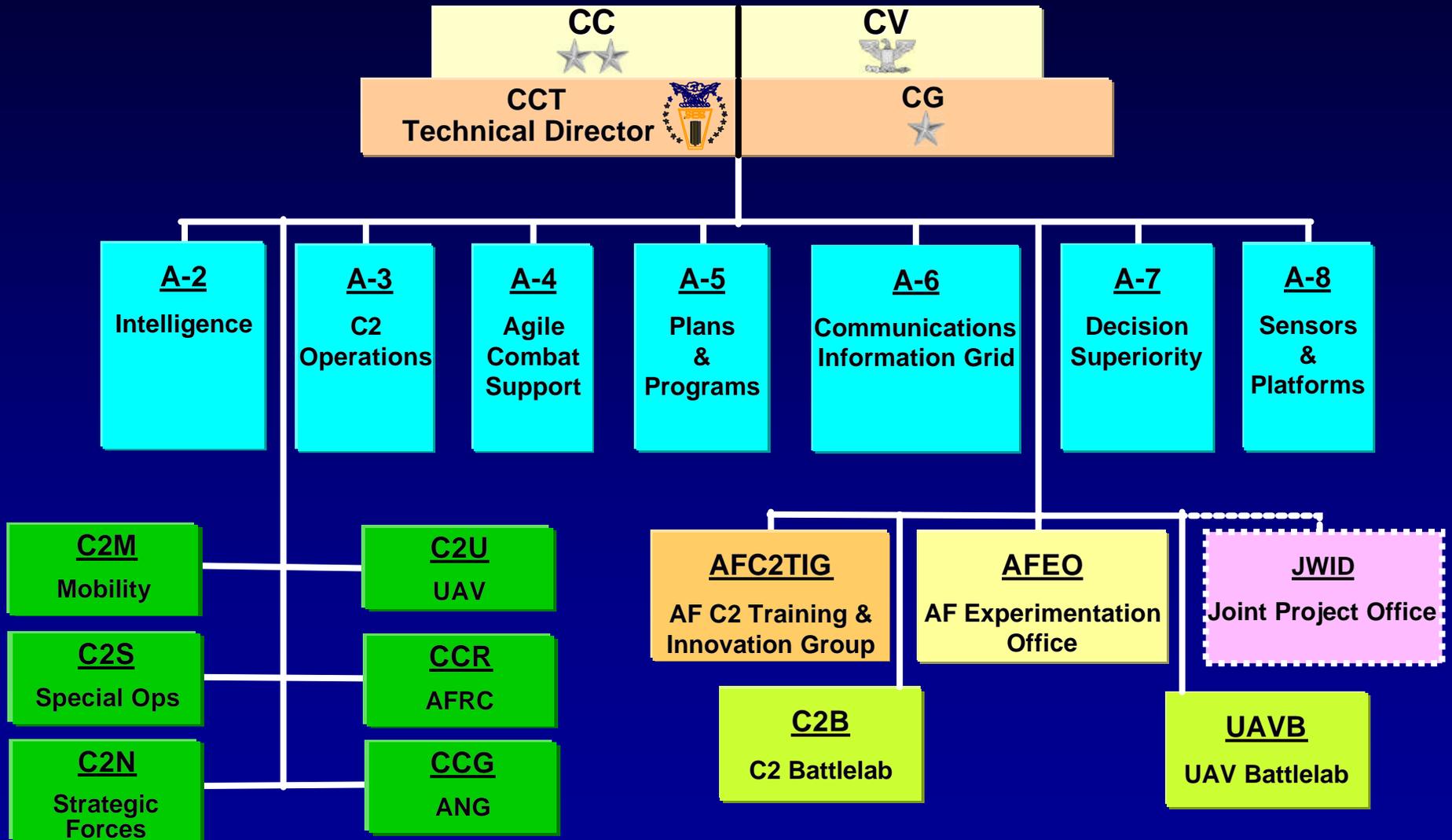
NCA

— Chain of Command
▬ Coordination



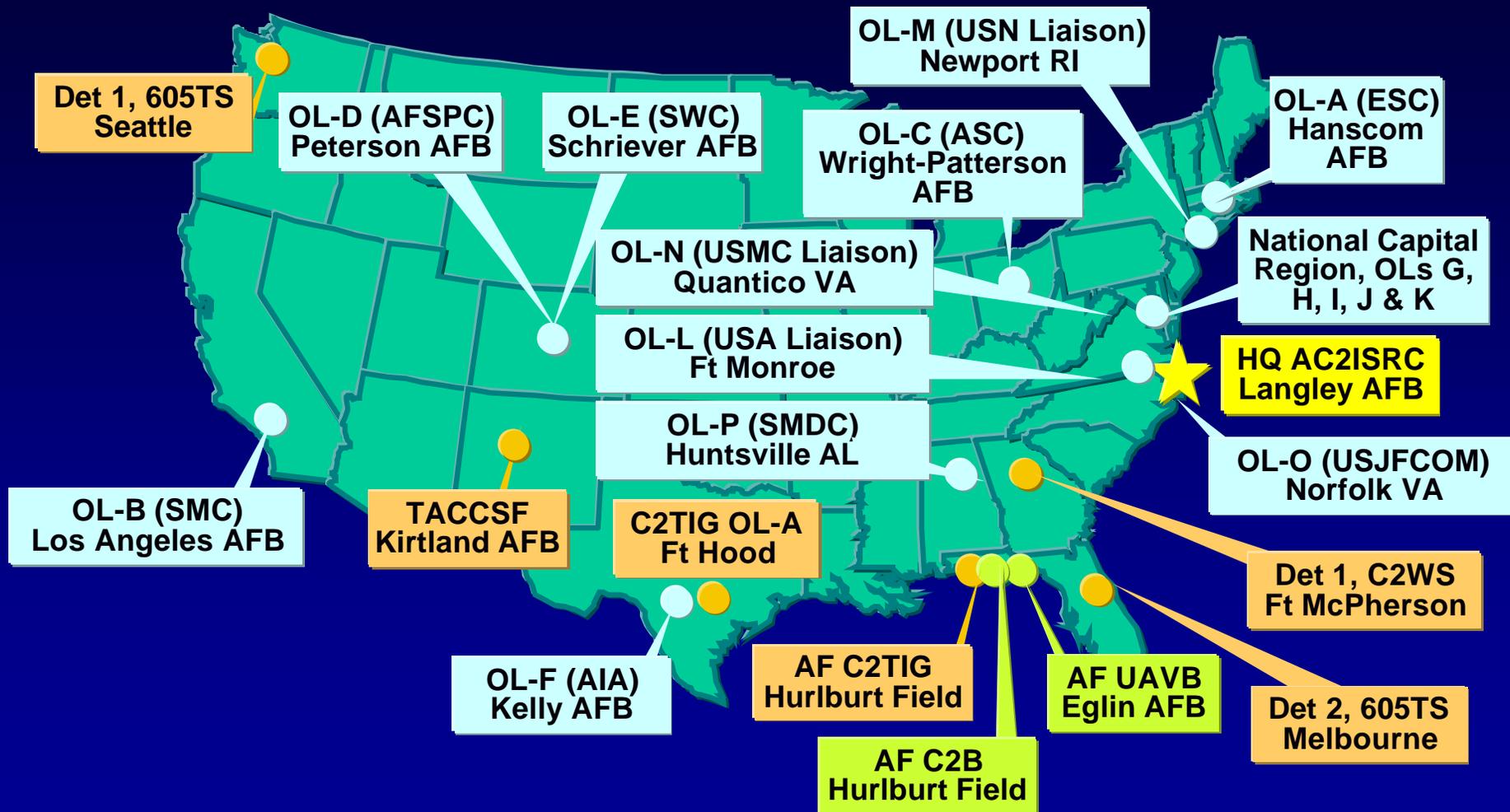


AC2ISRC Organization





AC2ISRC Locations





Top-Five Needed Critical Capabilities



- Collaborative C2 Centers that operate with standard rules in an assured data environment
- COP that collects and displays decision-quality data like an operational radar
- Accurately Find, Fix, Track Time Critical Targets
- Dynamic effects-based targeting, weapon pairing and control
- Automated and timely effects-based assessment



Overview



- Mission and Organization
- **Priorities**
- Challenges



AC2ISRC/CC

Top Five Personal Priorities

(as of Sep 00 – Revised Biannually)



- **Create and use CAOC-X**
 - **Web enable all C2 applications within GCCS-AF structure**
 - **Create JTF-SWA CAOC**
 - **Embrace many partners**
- **Create TCT capability by collaborating jointly and using Nellis CAOC**
- **Define AF C2ISR “To Be” CONOPS and Ops Architecture**
- **Build joint CONOPS and way ahead for the operationalized picture of the battlespace**
- **Make the C2ISR 03 APOM submission “capability based”**



Combined Aerospace Operations Center (CAOC)

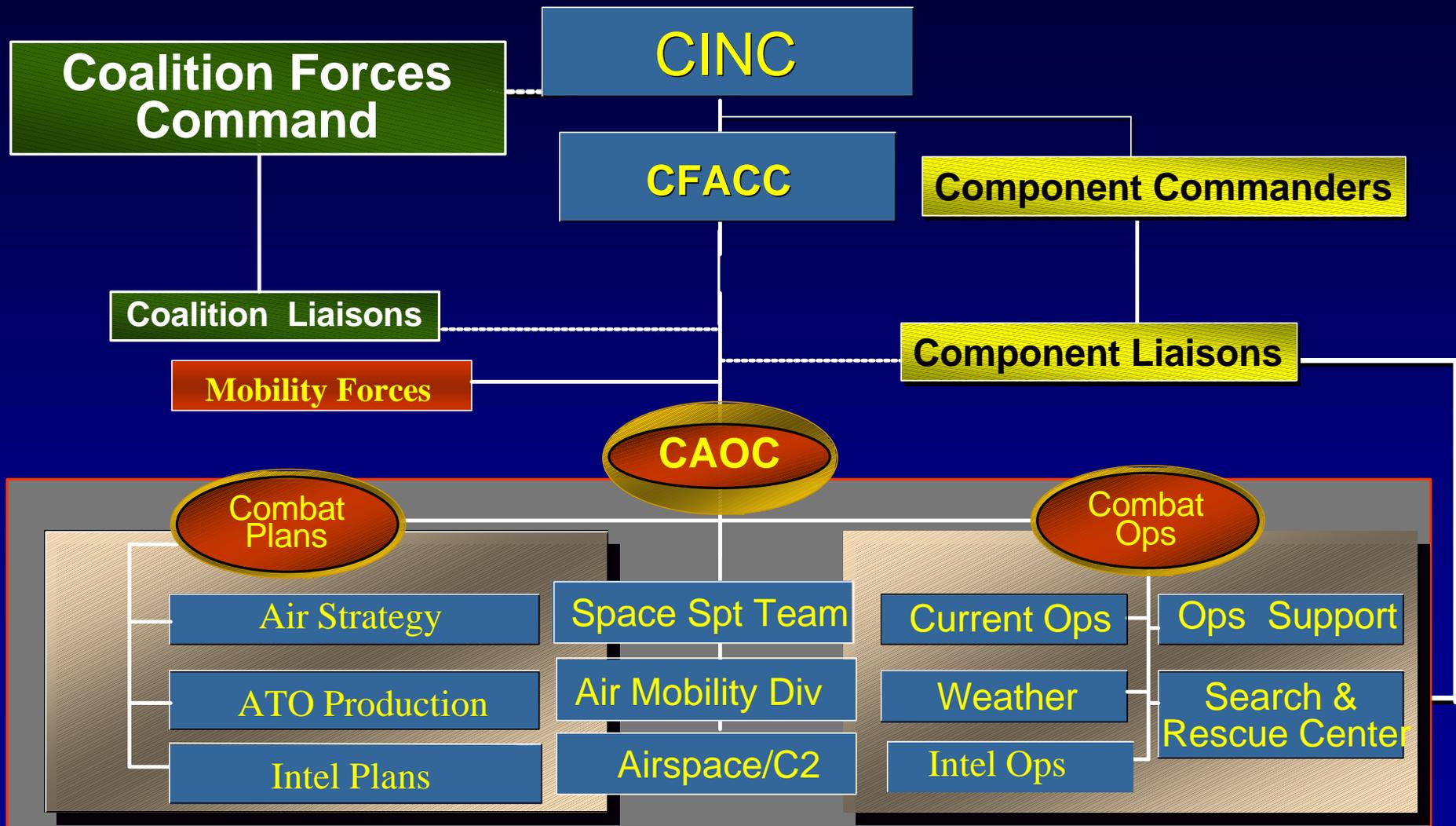


... to **integrate** limited assets in support of the JFC's objectives.



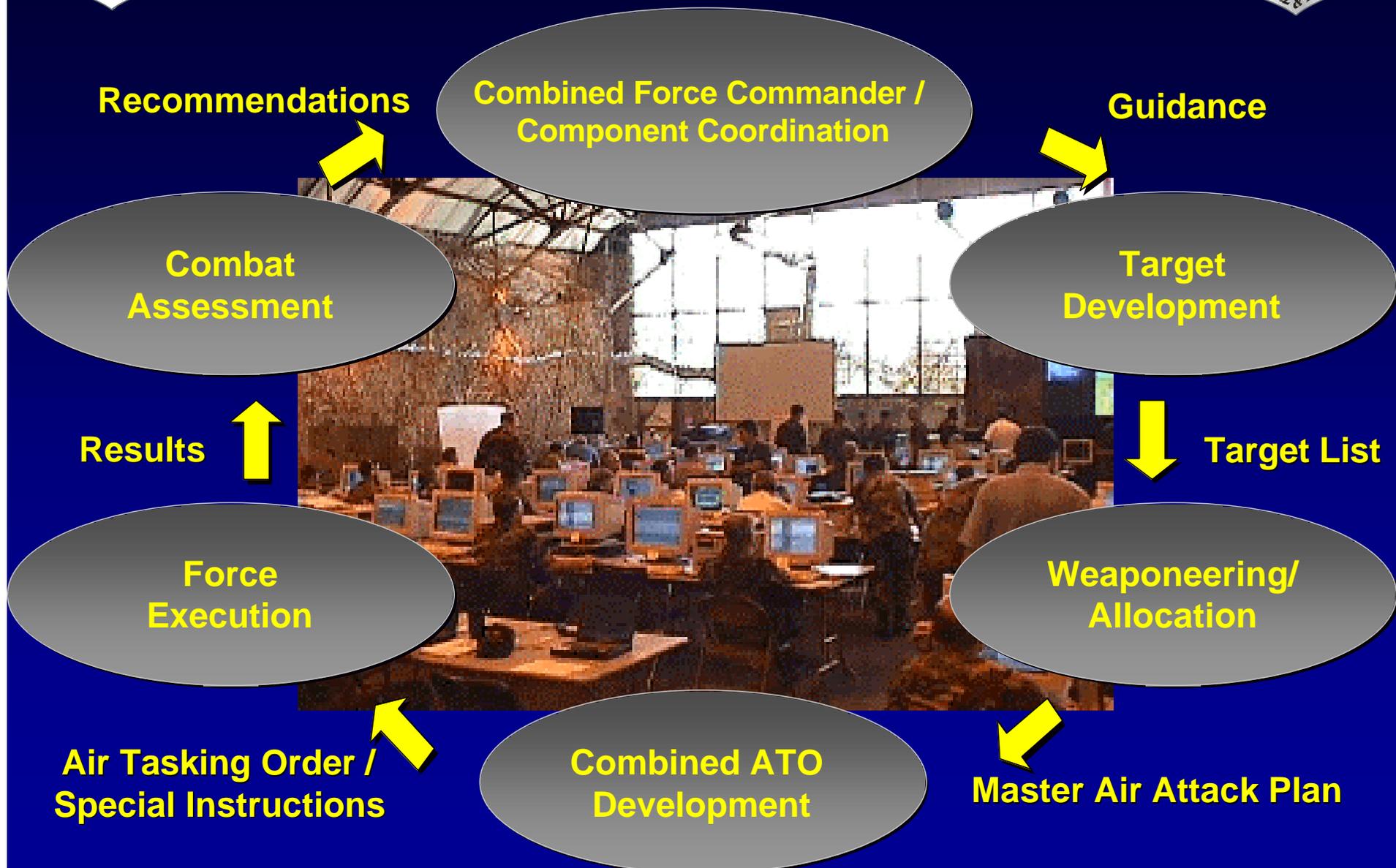


CAOC Organization





Air Tasking Order Cycle Model





CAOC-X Mission Statement



A place and process to rapidly develop and field the AOC Weapon System



Development Process Foundation (AFI 33-124)

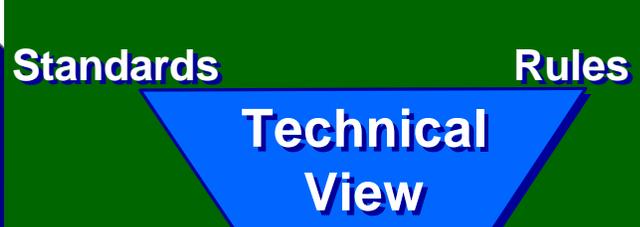


CONOPS



Identifies Operational Requirements And Information Needs

One Architecture



Prescribes Standards and Conventions

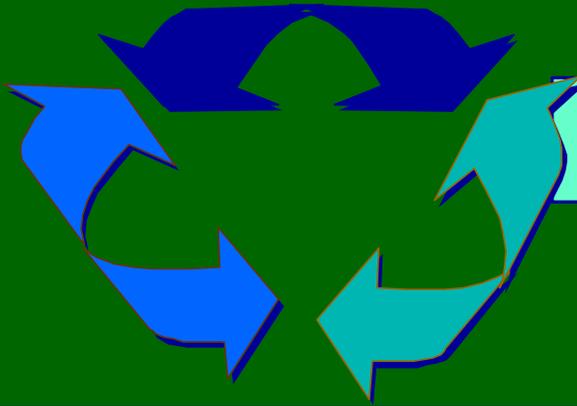
Conventions

Information Flow



Relates Capabilities to Operational Requirements

Communications



Spiral Development

Spiral Development IPT

Requirements

Integrated Management Team

Industry & Government

Spiral

Feedback

SPO

CAOC-X
Spiral
Floor

CAOC-X
Ops
Floor

Increment

B-1

Build

- Beta Site Ops Assessment

B-2

Build

- Test, Training, Security

B-3

Build

- Refine Requirements (80% solution)

- Feedback

- Mature
- Test
- Train
- Security

Test

Spiral

Field

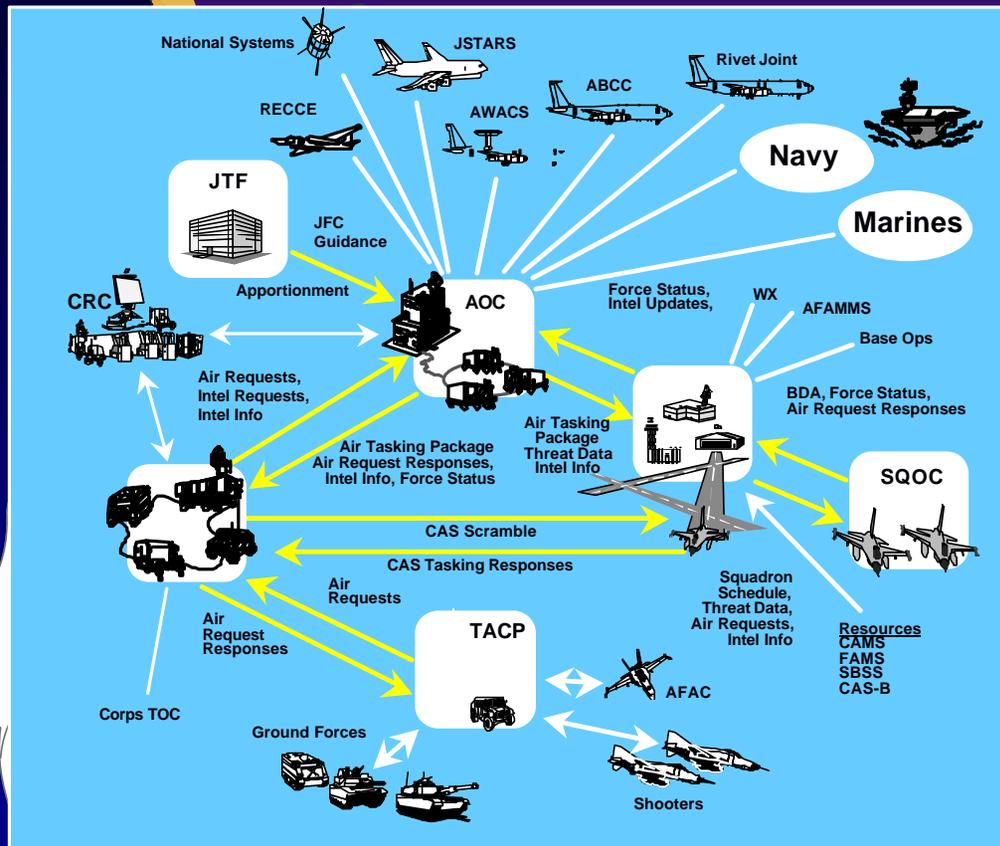
CONCEPT DEVELOPMENT

BASELINE DEVELOPMENT

FIELDING



What is TBMCS?



Links Planning, Intelligence, and Operations Functions

Integrates the Unique Capabilities of Several Legacy Systems

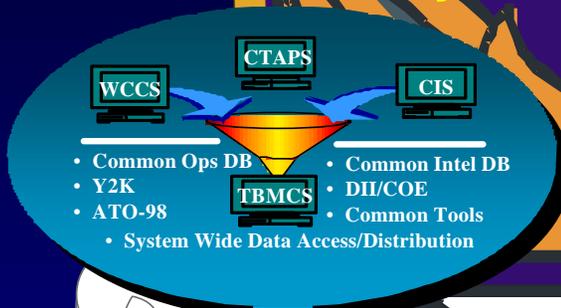
Migrates Air Warfare Applications to DII COE, the Single C4I System to Support the Warfighter from Foxhole to Command Post

Evolves With New Technology to Enhance Employment of Air Power

A Battle Management System for Planning and Executing the Theater Air War

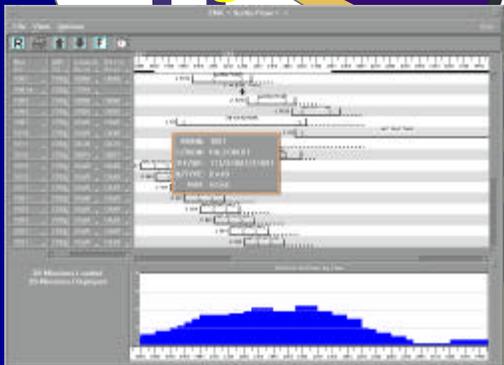
TBMCS Capabilities

Integrated Functionality



Consolidates 3 legacy system into one integrated capability between force and unit

Superior Execution Mgmt.



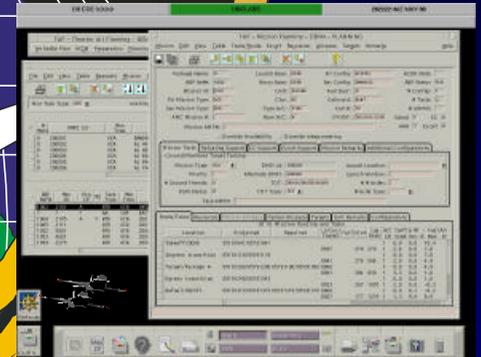
NRT Sortie flow View
Shared insight into Component Operations

Enhanced Interoperability



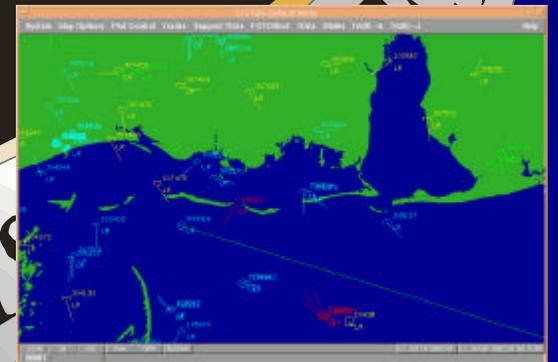
Joint & Allied Interoperability - USMTF 98
Automated coordination on targeting, planning, and execution
Automated Army Air Support Requests
Real Time Air Lift Interface

Robust Planning



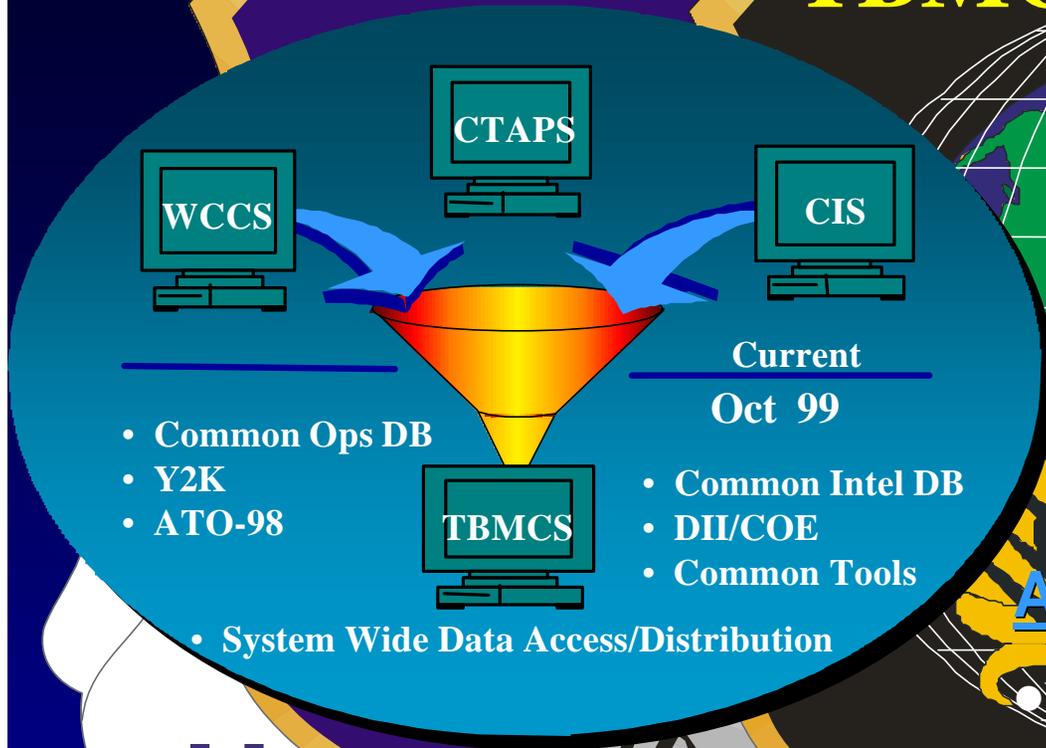
ABP - 3 times more comprehensive, 1/3 Less operators, 25% less development time

Shared Enemy Awareness



NRT Enemy Order of Battle
Updates Shared Common Operational Picture

TBMCS



Combat Plans

- JFACC Planning Tool (JPT)
- Joint Defensive Planner (JDP)
- Theater Air Planner (TAP)

Combat Operations

- Execution Management (EM)
- Time Critical Targets (TCT)

Air Support Ops Center

- Close Air Support Tool (CAST)

Unit Level Applications

- Flying Operations (FLYOPS)
- Air Base Operations (ABOPS)
- Wing Support (WS)

Common Tools

- Air and Space Conflict (ASC)
- Targeting Weapon Planning (TW)
- Situation Awareness (SA)
- ATO/ACO Tool (AAT)
- I3 (Integrated Intelligence & Imagery)
- Weather



TBMCS Web Enable Goal

Provide a secure, platform-independent, single point of entry
in, browser-based point of access to the right information,
at the right time, and in the required format, from any location
based on individual roles, interests and use.

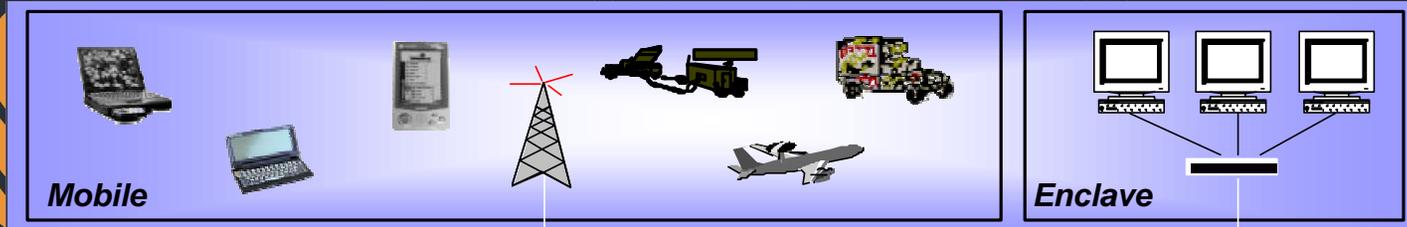
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Reduced hardware footprint and ease the sysad burden to
the greatest extent possible

Objective Web Enabled Architecture

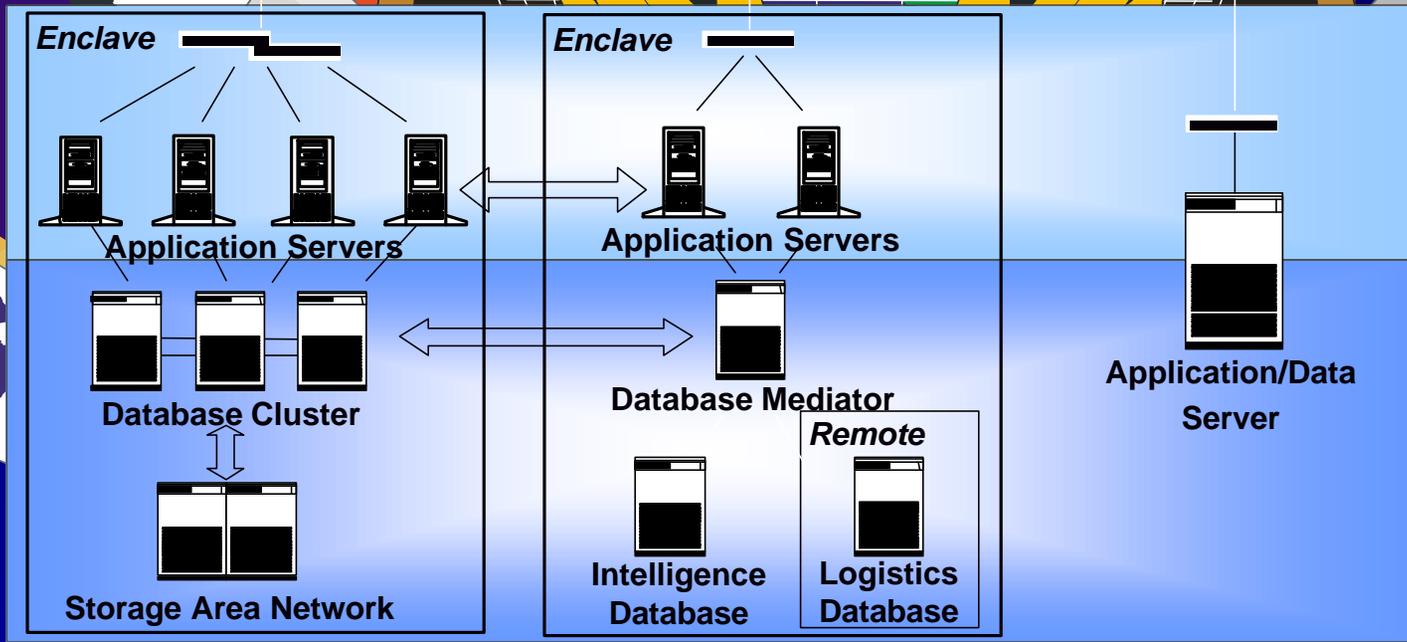
Information Appliances



Global Grid



Integrated Security



Data Management

AOC Objective System Architecture



Thin Client

100MB LAN

Msg Processing, Office Auto, On-line help, Web services, Comms, Data access, Apps, Data mgmt, ...

Security, network and print services, system mgmt

Database Cluster

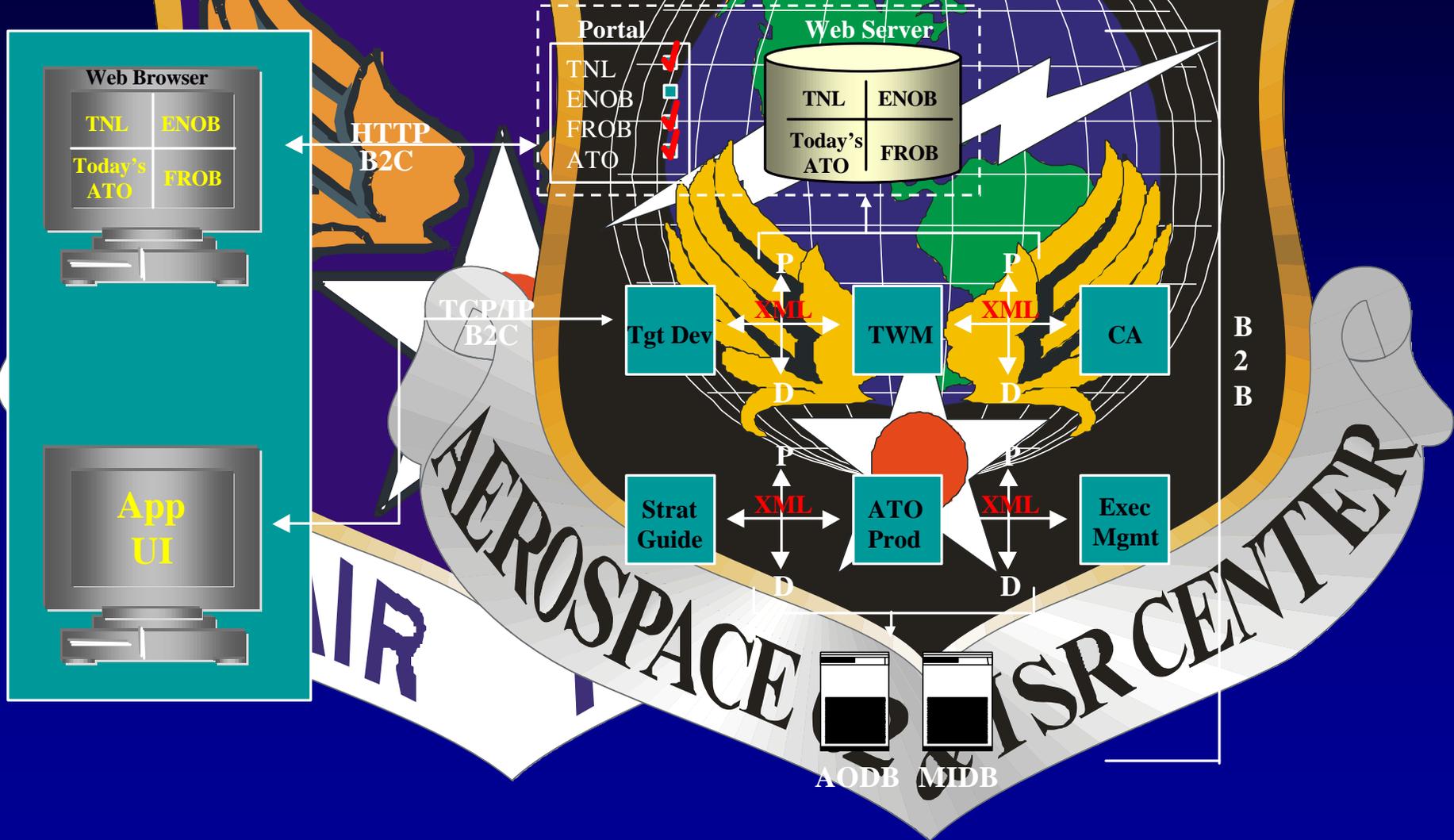
Open Source

Database

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2 & ISR CENTER

Detailed TBMCS-Force Level Architecture

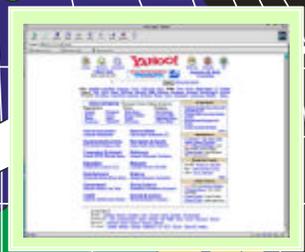


Commercial Evolution of Web Access

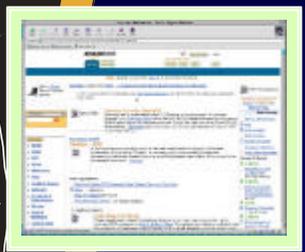
- Internet
 - Browsing
 - Personalized views
 - On-line transactions



aol.com



yahoo.com



amazon.com

- Horizontal Enterprise Access
 - Broad range of applications, information and services



MII



W3.ibm.com



AFMC

- Vertical Enterprise Access
 - Focused applications and services for functional areas



AFC Daily

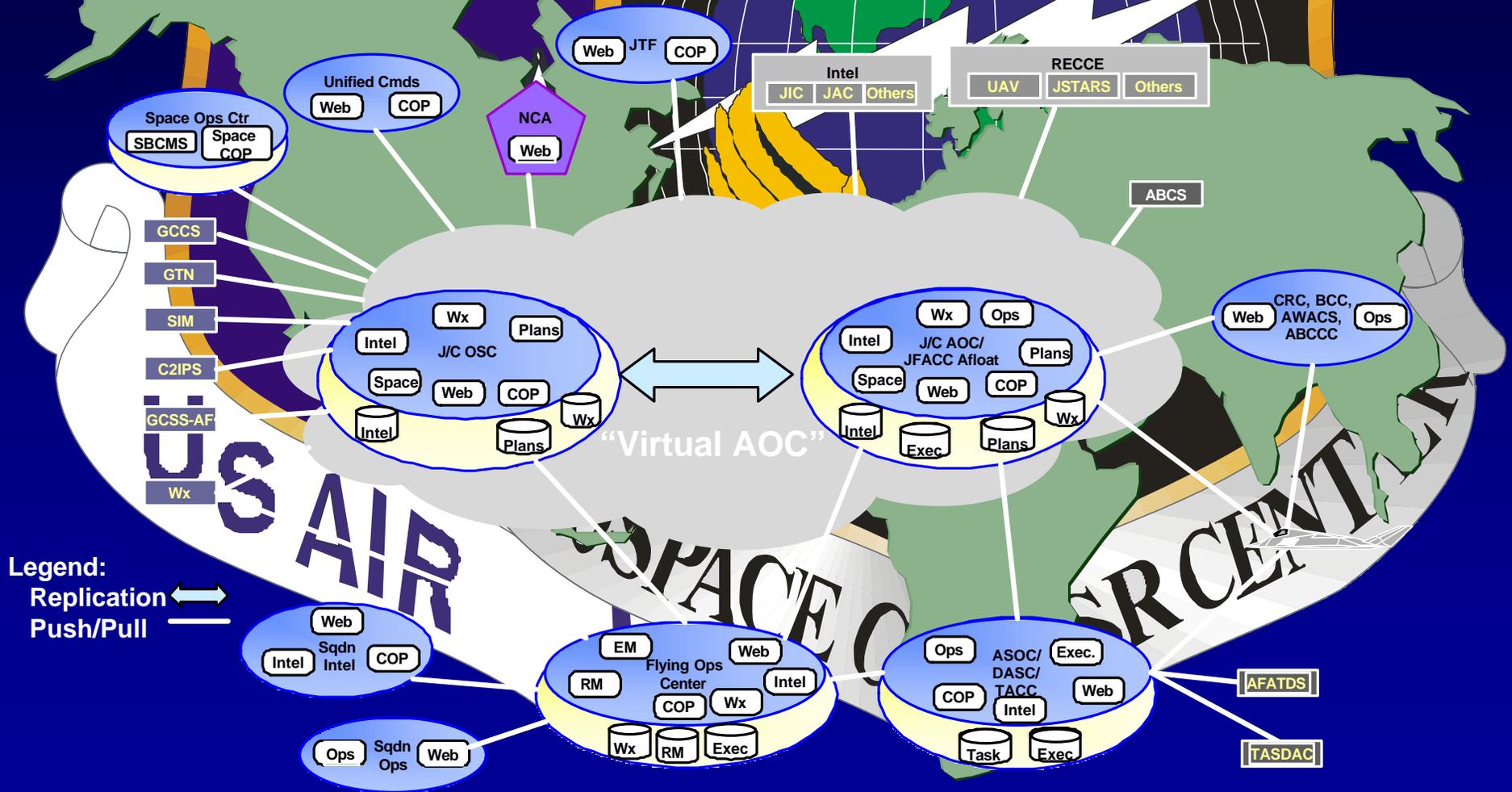


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Objective System Architecture

Global Information Grid



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- [Tune in for Leonids Show](#)
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TIME Daily

- [All Roads Lead to the Courts](#)
- [Let the Chads Fall Where They May](#)
- [Startled by Clinton's Flesh-Pressing](#)

Local News & Weather

MSNBC Weather - Newport News, VA

Monday	Tuesday	Wednesday	Thursday
			
Mostly Sunny	Sunny (Clear at night)	Sunny (Clear at night)	Sunny (Clear at night)
High: 52° Low: 32°	High: 49° Low: 25°	High: 40° Low: 26°	High: 42° Low: 30°
			More Weather...

MSNBC Local News

Stories for: Norfolk, VA

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- [Flubs put spotlight on how networks call elections](#)
- [Web-related companies still top Deloitte's Fast 500 list](#)

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Address <https://www.mytbcms.mil/welcome/barringer@a1.html>

Welcome to TBMCS

Monday
27 November, 2000

Hello Mr. Barringer!

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- [Red Ground](#)
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- [Red Sea](#)
- [More...](#)

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- [ACC](#)
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- [USS Cole Imagery](#)

Weather



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Welcome Maj Tony Buenger! Tuesday, October 31, 2000

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Updated 10/31 6:00 AM EST

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- Israel Raids Palestinian Targets
- Audit Uncovers Boeing Problems
- Bush, Gore Try to Draw Distinctions
- Clinton Veto Escalates Budget War

HAF Dash1

THE ULTIMATE GUIDE TO HEADQUARTERS AIR FORCE

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Air Force White Pages

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Active Duty Guard Reserve Civil Service Global Address List

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Air Force Online News

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Early Bird News

- CURRENT NEWS EARLY BIRD (10455)
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- Containing Iraq: A Forgotten War
- Iraqi Trade Doing Fine Despite Sanctions
- Saudi Militant Osama Bin Laden May Be Plotting Attacks Against U.S.
- MPs Attack Nato Role In Kosovo War
- Threats Send Forces In Gulf To Highest Alert

AC2ISRC/CC

Top Five Personal Priorities

(as of Sep 00 – Revised Biannually)

- Create and use CAOC-X
 - Web enable all C2 applications within GCCS-AF structure
 - Create JTF-SWA CAOC
 - Embrace many partners
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- Build joint CONOPS and way ahead for the operationalized picture of the future space
- Make the C2ISR 03 APOM submission “capability based”

Unclassified

Time Critical Targeting



Unclassified



TCT Capability Situational Awareness & Target Development Tools



ISR BatMan Tool

•Coverage Visualization

**FIND
FIX
TRACK
TARGET
ASSESS**

TCT Aid

Maps

Targeting Guidance
-Air Tasking Order Analysis
-IPD
Weapon Performance
ISR
ROE / Restrictions /
SPINS

**FIND
FIX
TRACK
TARGET**

Sensor Correlation/Fusion
Combat ID Verification

Intel Prep of Battlespace (PBA)

Op Areas for: Attack
Ops, Passive / Active
Defense

TCT Activity Areas
Named Areas of Interest
High Value Targets

D
FIND
Threat / Priority Tgt List
Situation Templates
Tactics, Technique,
Procedures Template

Target Weapon Pairing

Weapon Capability
Pairing
ENGAGE
May Recommend ISR
Retasking

Situation Display

Air & Ground Tracks
Air
TRACK
Air Defense Artillery
SAM engagements

Terrain Analysis

Mo
FIND
Terrain Masking

Joint
Inter
Non
**JOINT
ENGAGE**

Nellis CAOC

Briefing & DV
Trailer

CAOC-F

SCIF

- Improve TCT TTPs

- Improve operational and tactical levels

- Address Kosovo, ONW, OSW, and Desert Storm lessons

- Improve flexible attack ops inside ATO

- Demonstrated during JEFX 00

CAOC-F

OPERATIONAL CENTER
C2 & ISR

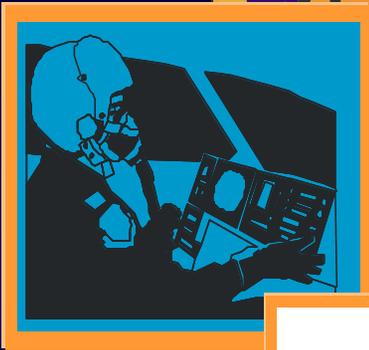
Training Audience

- Three Primary Audiences:

- Tactical Aircrews taking part in Red Flag, Weapons School & Air Warrior

- CAOC Operators assigned as core cadre to a CAOC Operations Squadron

- Air Superiority Leaders performing CAOC Director and Joint Director duties



AC2ISRC/CC

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OV-1 AF Theater C2&ISR System

Reachback Support

- National Nodes
- Multi-national Nodes
- Joint Nodes
- AF Global Nodes (DCGS etc.)
- Nodes From Other Theaters



Time: 2000-2004
Scenario: MTW

Core Competencies
TAGS
AETACS
GTACS
ISR

AF C2ISR "To Be" CONOPS & Ops Architecture

Reachback Support

- National Nodes
- Multi-national Nodes
- Joint Nodes
- AF Global Nodes (DCGS etc.)
- Nodes From Other Theaters



Support Requests

Time: 2005-2013
Scenario: MTW

Notional

CONOPS Efforts

- AF C2&ISR CONOPS
 - “As-Is” in MAJCOM two-digit coordination
 - “To-Be” in draft, MAJCOM conference Nov 00
- Theater Air Control System CONOPS
 - Final draft due 29 Nov 00
- AF AOC CONOPS
 - Out for MAJCOM / GC coordination
- AFFOR CONOPS
 - Out for MAJCOM 2-Ltr coordination
- CAF CONOPS for Integration of C2&ISR
 - In MAJCOM two-digit coordination
- AF CONOPS for C2 Against Time Critical Targets
 - Approved 27 Nov 00
 - Take up for 1st Qtr CY01
- GCCS-AF CONOPS
 - Completed MAJCOM 3-Ltr Coord
 - Sending for 2-Ltr Coord 4th Qtr CY00

U.S. AIR FORCE

SPACE & ISR CENTER

AC2ISRC/CC

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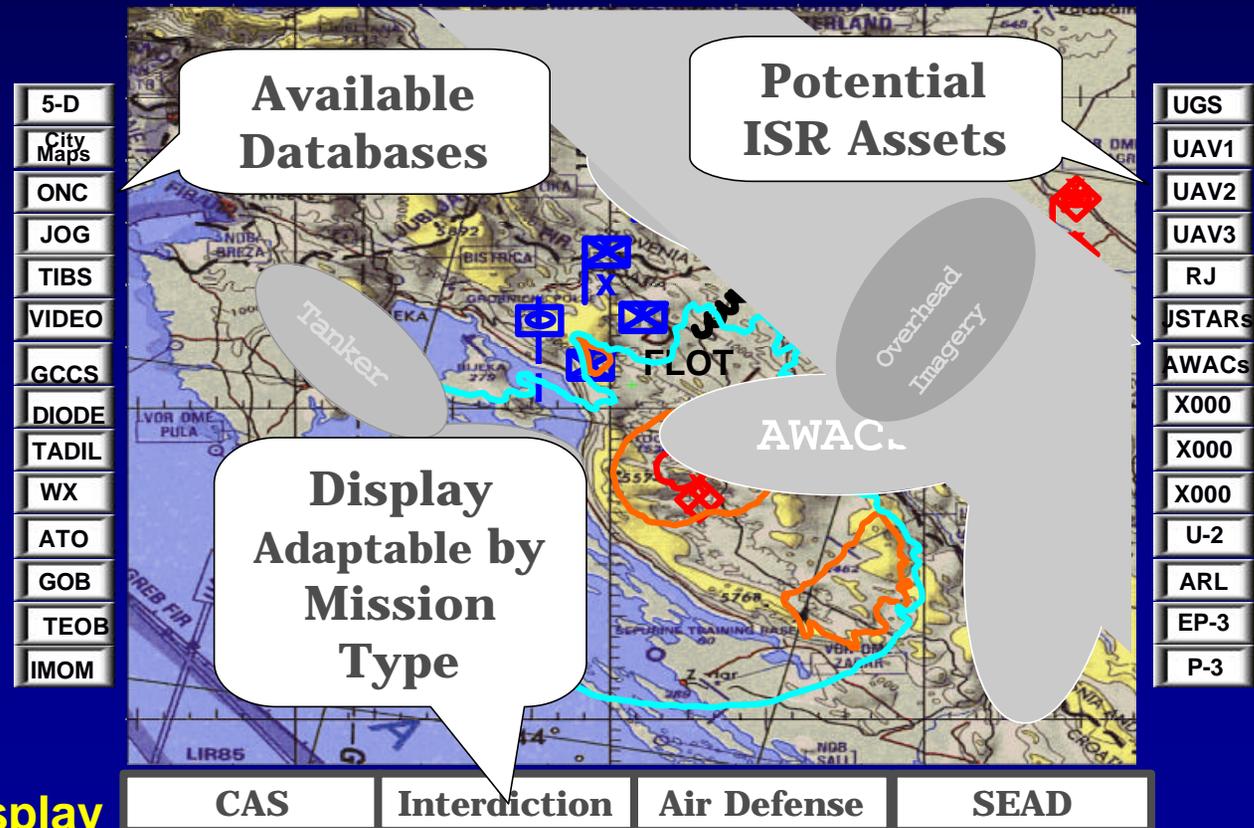
Family of Interoperable Operational Pictures (FIOP)



Unambiguous, Tailorable View of the Battlespace with Actionable, Decision-Quality Information to Achieve Decision Superiority

- Phase 1:
CONOPS
- Phase 2:
Requirements Definition
- Phase 3:
Implementation Strategy

Notional Display



FIOP Plan

2000

2001

2002

SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN...

Phase I

Phase II

Phase III

Follow-on Effort

- Phase I (AF Led) Oct 00 – Feb 01 (5 Months): Develop Joint CC GPS
- Phase II (Air Led) Nov 00 – Sep 01 (11 Months): Define requirements
- Phase III (Marine Led) Nov 00 – Sep 01 (11 Months): Develop Implementation Strategy
- Follow-on Effort: Oct 01 – TBD: Execute implement strategy

US AIR

AEROSPACE C2 & ISR CENTER

Advanced Battlespace Awareness ACTD

Flag Oversight Board
DUSD (AS&C)

*DUSD(AS&C)
USCINCEUR (J3/J6)
AF/XO*

Lead Service
*Air Force
XOC*

Lead CINC
USEUCOM

Technical Managers
*AC2ISRC
and AITS-JPO*

Operational Manager
*EUCOM J6
and AC2ISRC*

Technical PM's
AFRL

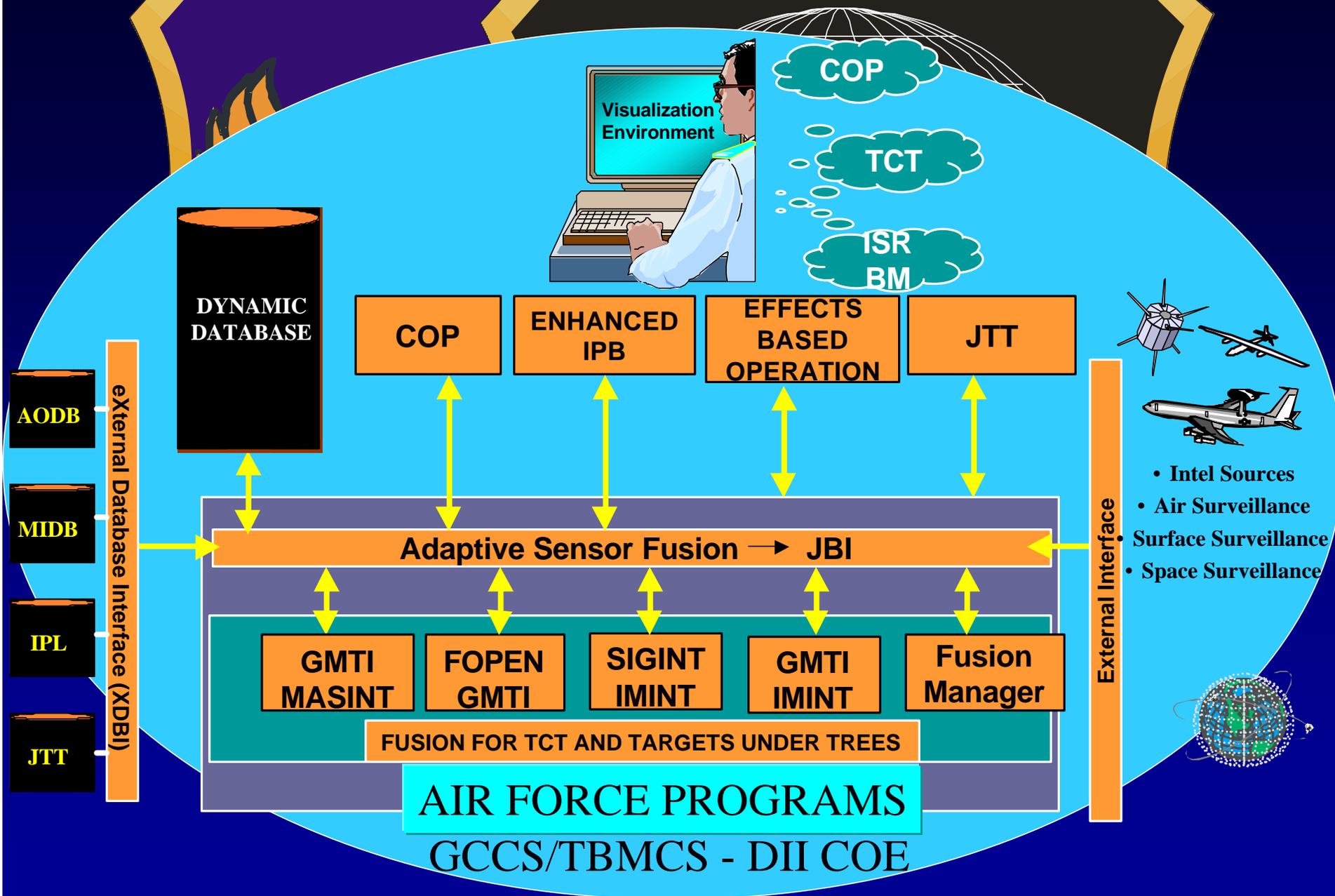
Transition PM's
ESC

Spiral Evaluations
CAOC-X

JTF
3AF, C6F

Test Agent
AFOTEC

ABA Architecture



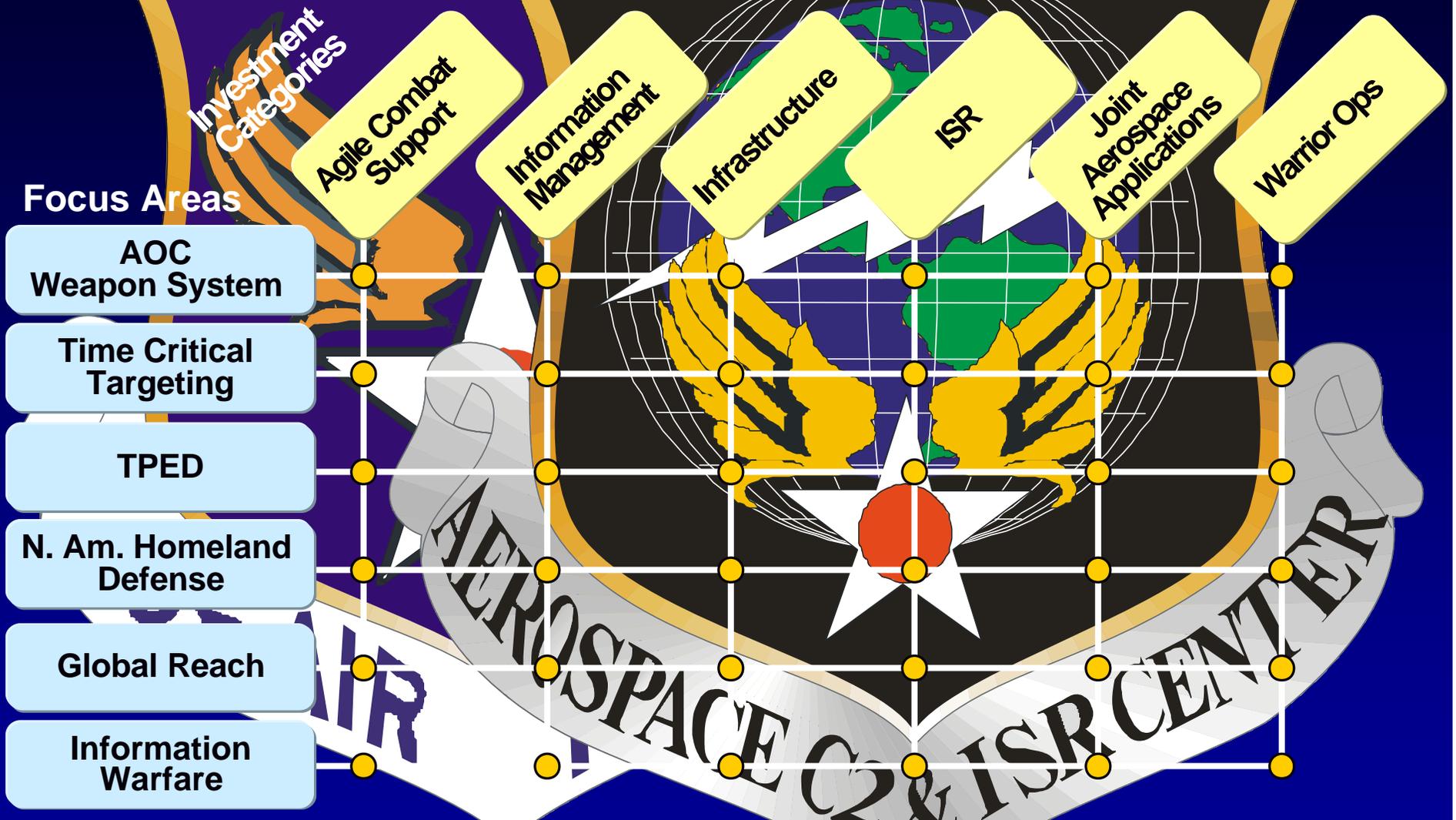
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Planning and Programming



Cross cutting issues: Sustainment, Divestiture, Integration, Technology Insertion

Challenges

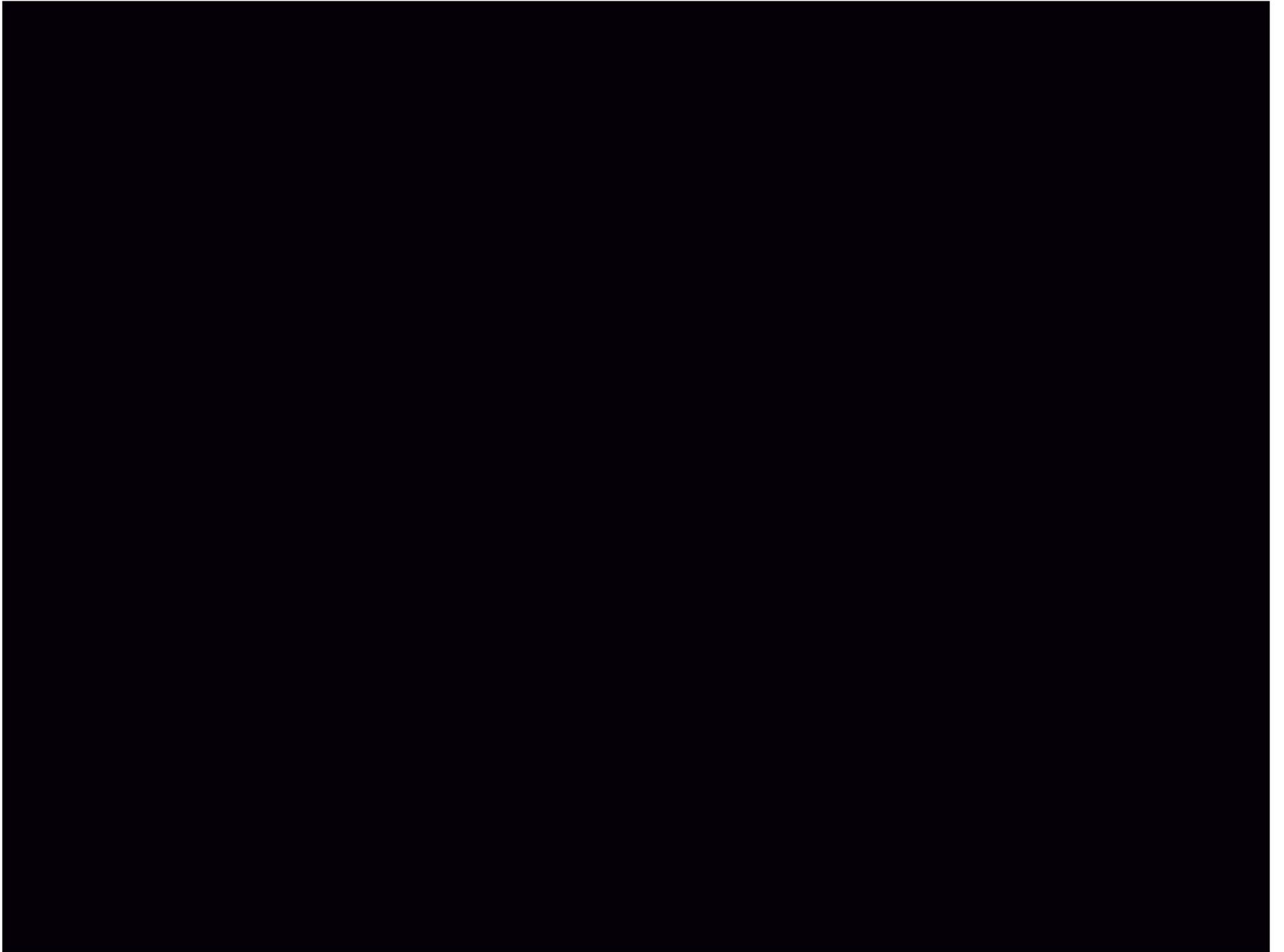
- Develop way ahead for web-based ISR
- Utilize CAOC-7 to experiment
- Capitalize on commercial technology base
- Operate in a multi-level secure environment with coalition partners

US AIR

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Questions?



Predictive Battlespace Awareness Needed Capabilities

- Dynamic knowledge base including history
- Continuous simulation, analysis and prediction of enemy course of action
- Integrate airborne sensors and space sensors into PBA process

US AIR

AEROSPACE CENTER
ISR CENTER

Know and Predict the Crime Scene Before the Crime

Deter / Deploy Needed Capabilities

- Automated ATO build
- En route tasking, mission planning and near real-time assessment
- Global collaboration
- Real-time planning, control and execution
- Reduced forward footprint
- Total asset visibility

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Focus on Decisions, Not Data

The Kill Chain



Requires Family of Systems

CAOC-X Mission Statement



Rapidly evolve the Combined Aerospace Operations Center weapon system by combining the efforts of warfighters, developers, contractors, and testers, working together to provide the Joint/Coalition Forces Air Component Commander the decision making tools to prosecute the air war and command aerospace power.

Place and processes to rapidly develop and field the AOC Weapon System

Employment Needed Capabilities

- Work in a multi-level security environment
- Real-time information into the planning process
- Quickly establish and manage virtual planning teams
- C2 nodes and platforms retrieve, manipulate, correlate and fuse best available data
- Accurately Find, Fix, Track Time Critical Targets
- Dynamic effects-based targeting, weapon pairing and control
- Timely and timely effects-based assessment

US

AIR

SPACE

C2

&

ISR

CENTER

Nellis CAOC Mission Statement

Provide a combat operations platform to perform training and testing of the equipment and concepts which constitute the Combat Operations Division of a Combined / Joint Air Operations Center (AOC)

US AIR

AEROSPACE C2 & ISR CENTER

Way Ahead

- Create capabilities through CAOC X
- Work jointly to improve TCI capability
- Refine AF C2ISR "To Be" CONOPS and ops architecture
- Build CONOPS and way ahead for the operationalized structure of the battlespace
- Provide a capabilities-based C2ISR 03 APOM submission

US AIR

NEUROSPACE C2 & ISR CENTER

TBMCS Multi-tiered Software

Mission Applications
UNIX Based
X-windows UI

Clients

Application Server
CORBA Services
No web content publishing

Middle

MIDB

AODB
Oracle 7

Private
DBs

Databases

Web-enabled TBMCS Architecture

Web Browser
Java Applets
TBMCS Portal

Clients

Web Enabled Application Server
HTML/XML content
J2EE Services, JSP web pages

Middle

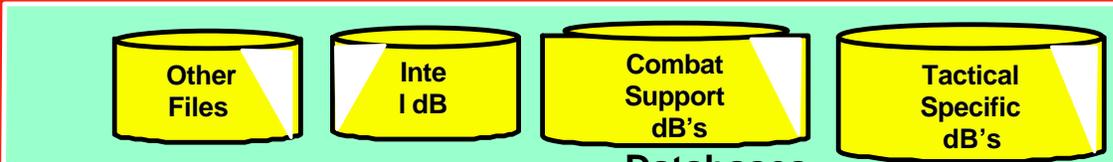
Intel

AODB
Oracle 8i

Other

Databases

TBMCS DII COE Architecture



COE

SHADE

▽ Extension of COE

▾ New COE Capability

FIOP Organization

Chair
(Air Force)

**Multi-Service C2
FOSC**

AF-provided Facilitators/Integrators

**Phase I
CONOPS Effort**
Air Force Lead

**Phase II
Requirements Effort**
Army lead

**Phase III
Implementation Effort**
Marine lead