

Headquarters U.S. Air Force

Integrity - Service - Excellence

USAF M&S: A New Vision



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Proposed M&S Vision

Modeling and simulation capabilities enabling the United States Air Force ...

to organize, train, educate, equip, and employ

current and future air, space, and cyberspace forces for the full range of operations*.

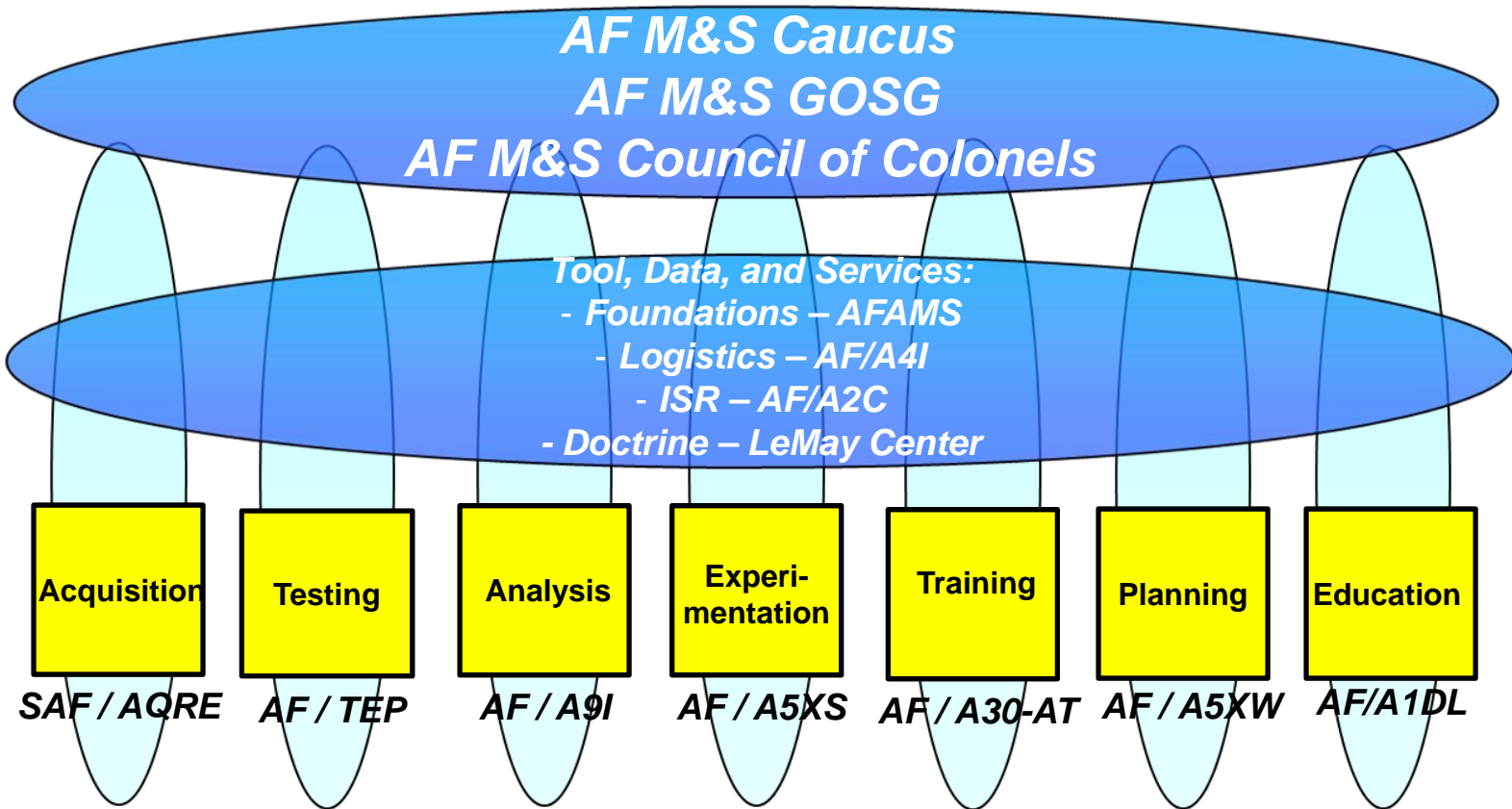
* “Range of operations” includes but is not limited to military (single service, joint, coalition), interagency, and non-governmental.



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Proposed M&S Governance

Integrating the USAF into the DoD M&S “Communities” Approach



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M&S Vision: How We Use M&S

M&S: An enabler across the entire spectrum of AF activities:

- Acquisition and Logistics
- Science and Technology
- Research, Development, Test & Evaluation
- Experimentation
- Capability Planning
- Resource Allocation
- Force Planning
- Operational Assessment
- Operational Planning
- Educational Wargaming
- Training and Mission Rehearsal

The USAF does two fundamental things with M&S:
(1) Make better decisions – analytic activities
(2) Develop better skills – training and education activities



M&S Vision Implementation

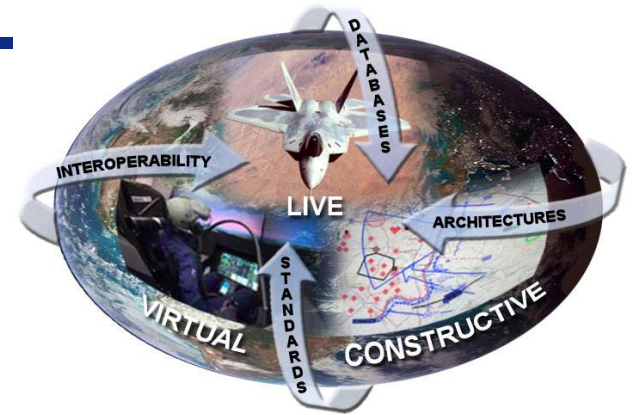
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Constructive models and simulations ...

Virtual simulators ...

Live platforms ...

Used individually or in combination ...



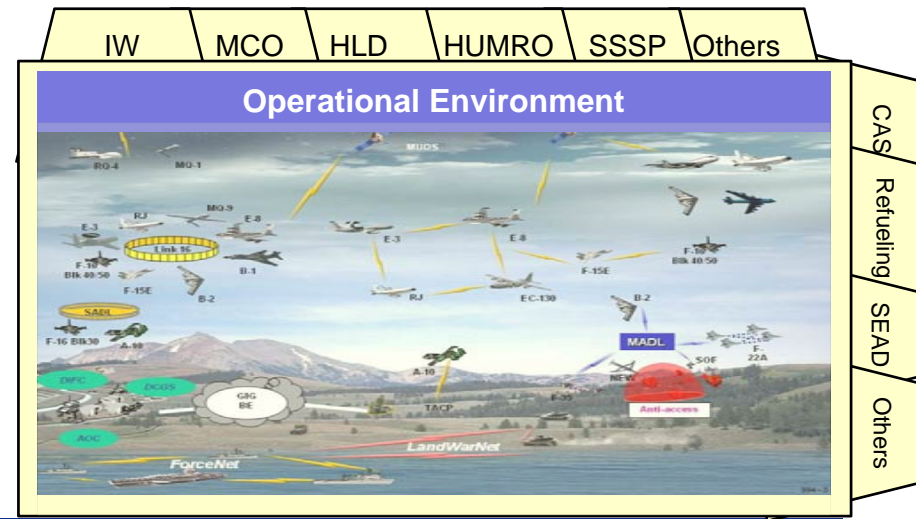
Across all
DOTMLPF

To provide an appropriate representation of the USAF operational environment across the spectrum of warfare...

Required across all user communities

At all levels of operation:

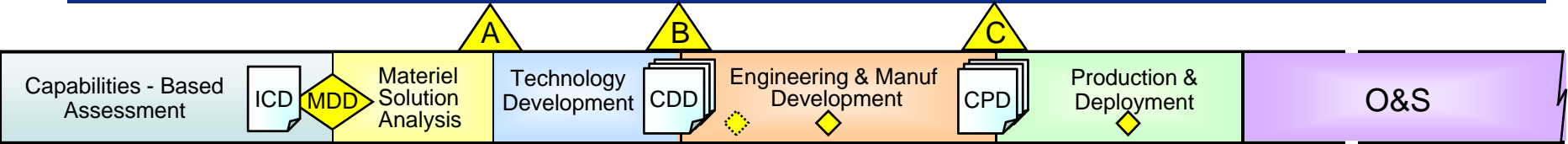
- Campaign - Mission
- Engagement - Engineering





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M&S Vision: Frameworks for Defining Requirements



DECISION FRAMEWORK

An extension and application of the DoD Analytic Agenda

Organizing Information:

- Roles and responsibilities *Who/where*
 - Measures
 - Processes
 - Assumptions
 - Scenarios, vignettes & data
 - Standards
 - Models
 - Simulations/simulators
 - Timing/cycles/scheduling *When*
- How* (bracketed next to Measures, Processes, Assumptions)
- What* (bracketed next to Scenarios, vignettes & data, Standards, Models)

Technical Information:

- Scenarios
- Datasets
- Measures
- Standards
- Network infrastructure
- Security agreements
- Business practices

Integrating Architecture

SKILLS FRAMEWORK



M&S Vision Comparison

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	1995 AF New Vector	2005 XC M&S Vision	2009 AF M&S Vision
M&S Activities	Analysis and Training (Decisions and skills)	Enabling AF CONOPS, DMO, NCW, and Accelerated Acquisition	Analysis and Training/Education (Decisions and Skills)
Framework	Vision, Quality Processes, Effective People, Solid M&S and Data	Preparing, Equipping, and Transforming	Analytic Framework, Education and Training Framework (includes processes, people, M&S)
Governance	Not defined	M&S Thrusts: Warfighter Readiness, Accelerated Acquisition, New & Emerging Warfighting Capabilities, Foundations	M&S Communities: Acquisition, Testing, Analysis, Experimentation, Training, Planning, and Education
M&S	HLA, MASTR, J-MASS, NASM, JSIMS, JWARS, Air Combat Simulation Training	Goals only	Frameworks to define requirements for M&S for each community as well as cross-cutting



Notional Decision Framework

(Research, Development & Acquisition Thread)

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CBA

- Determine and validate
- Baseline capab
- Postulated gap
- Scenarios
- MS&A Support:
- BOGSAT
- Spreadsheets
- Low-fidelity mis and campaign

- Evaluate candidate solutions vs validated ga
- Scenarios'
- Develop Me Framework
- First order C
- MS&A Sup
- AFSAT
- Augment v & construc net-centric

AOA

- further evaluate small # of candidat
- Scenarios''
- Refine Meas Framework
- Higher fidelity
- MS&A Suppo
- AFSAT
- High-fidelity centric mod
- Physics-bas models from
- Governmen LVC enviro

Tech Dev

- Refine one SoS
- Scenarios''
- Refine Measures
- SoS, Scenarios, Measures Framework from previous phase
- MS&A Support:
- LVC mix as appropriate
- SILs
- High-fidelity simulators
- High-fidelity constructive M
- Interoperability assessment
- Government-provided LVC environment
- High-fidelity net-centric models

EMD

PDOS

- SoS, Scenarios, Measures Framework from previous phase
- MS&A Support:
- LVC mix as appropriate for follow-on analysis and planning
- High-fidelity constructive M&S
- Government-provided LVC environment

Products Carried Throughout Process

Scenarios

Measures Framework

MS&A Support

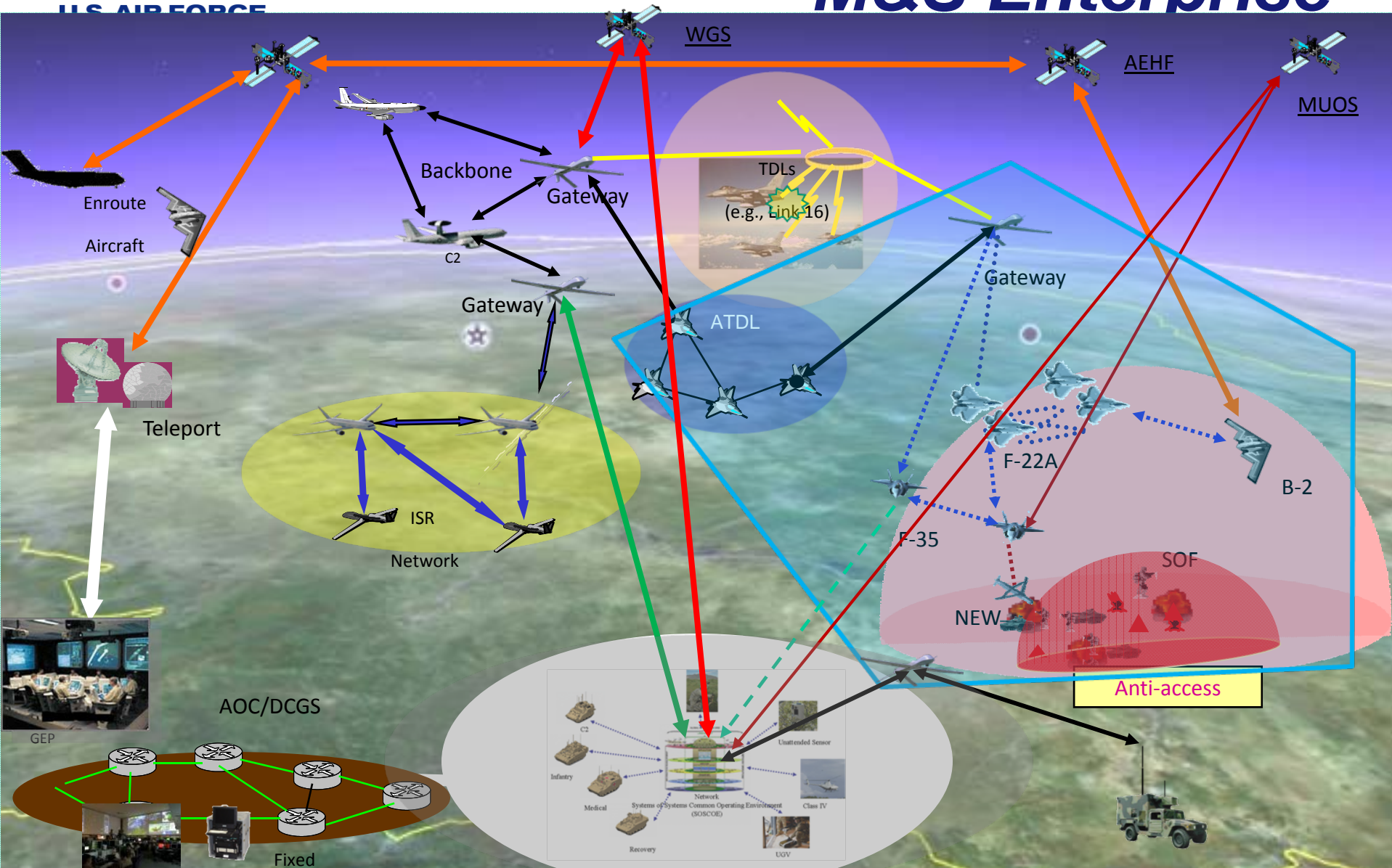
- Scenarios include:
- Defense Planning Scenarios and Vignettes
 - Threat laydown
 - Blue force structure
 - Timeframe
 - ROE
 - Assumptions
 - Data sets
 - ATOs
 - CONOPS/TTPS

- Measures Framework:
- Analytic Questions/Objectives
 - Mission MOEs
 - Task MOPs
 - System MOPs/KPPs
 - Data elements



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Example: Airborne Networking M&S Enterprise





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Example: Airborne Networking M&S Enterprise



Persistent Fires Example – Even a small test can involve significant assets

- Consistent with and derived from the “Decision Framework”
- DT/OT involvement in early M&S and measures development
- Government-owned environment
 - Data rights
 - SecurityIssues
- LVC environment like a range:
 - Composable
 - Schedulable
 - Scalable
- VV&A process that mirrors existing test processes and is not overly burdensome