



Network-Centric Testing: Developing the Required Infrastructure

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FCS Increment I

Manned Systems

1,530



Infantry Combat Vehicle

735



Command and Control Vehicle

900



Mounted Combat System

450



Recon and Surveillance

270



Non-Line of Sight Cannon

360



Non-Line of Sight Mortar

150



FCS Maintenance and Recovery Vehicle

435



Medical Treatment and Evacuation

Unmanned Air Platforms



Class I
810



Class II
540



Class III
180



Class IV
450



• Unmanned Payloads

• Unattended Ground Sensors

• Unattended Munitions

• NLOS LS - 900

• Intelligent Munitions



Unmanned Ground Vehicles



Armed Robotic Vehicle
ARV R - 405
ARV A - 270

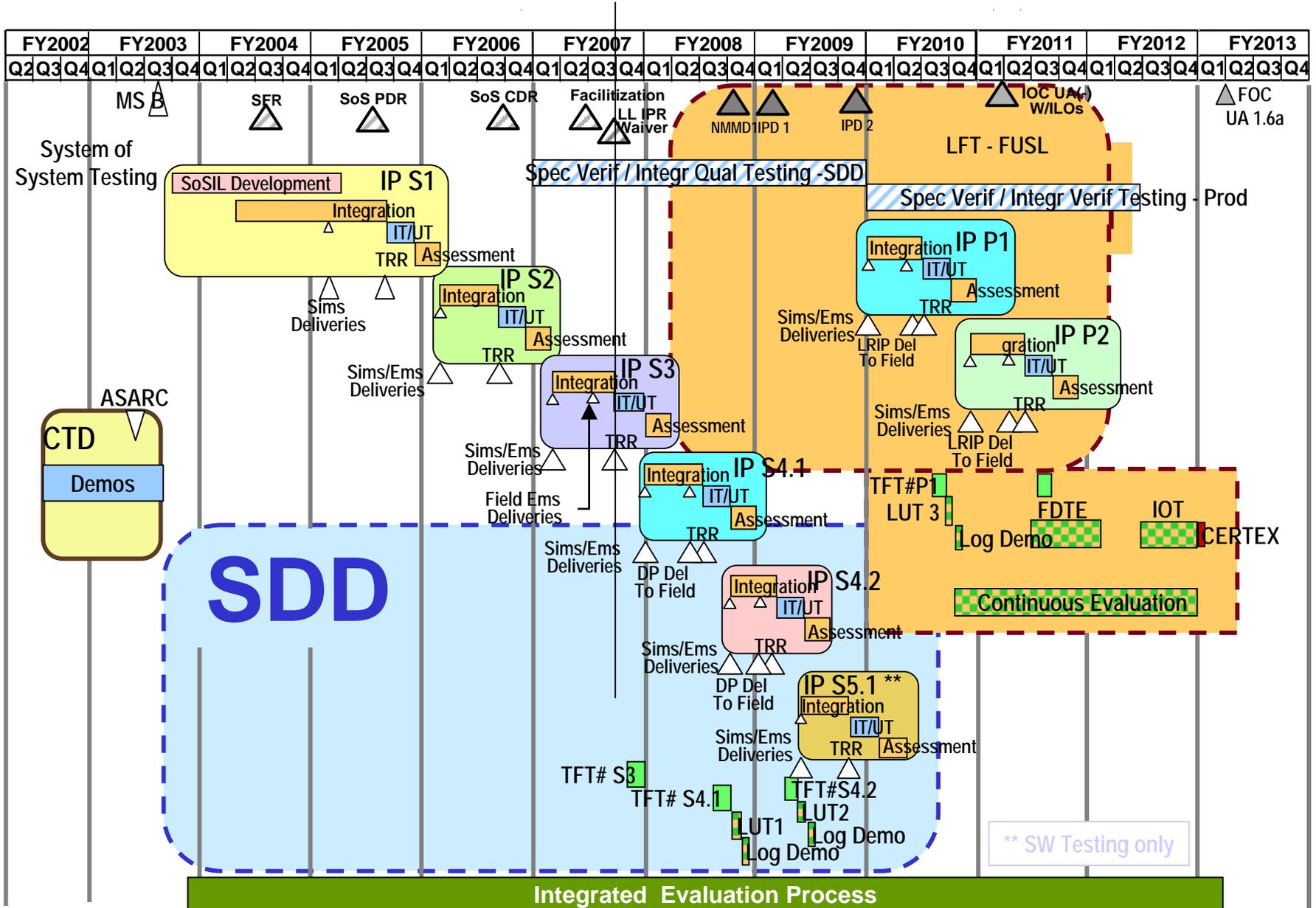
1,215
Small Manpackable UGV



Mule - 900
ARV-L - 270

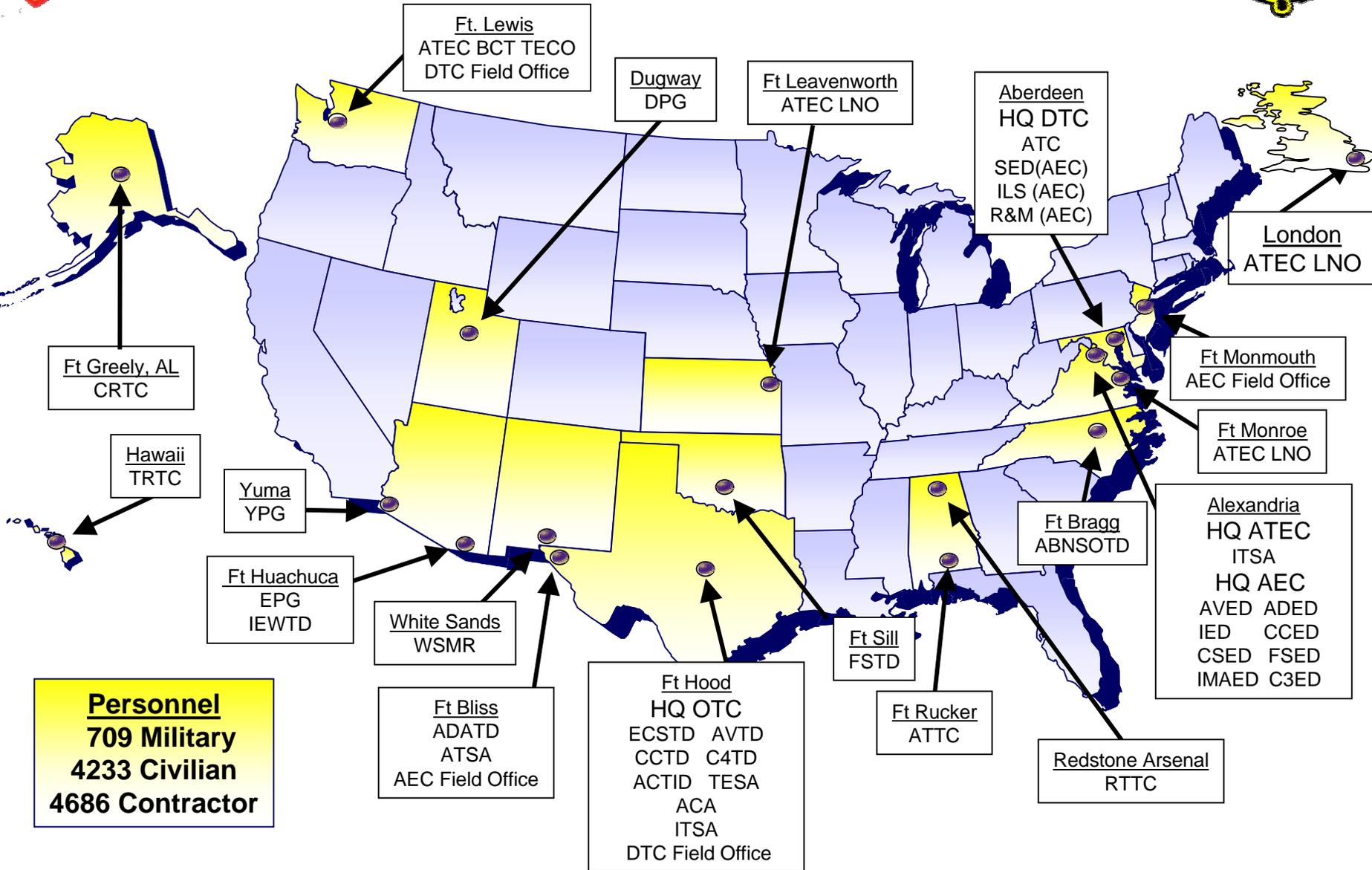


FCS Test Program Schedule Version 1.0 Rev C





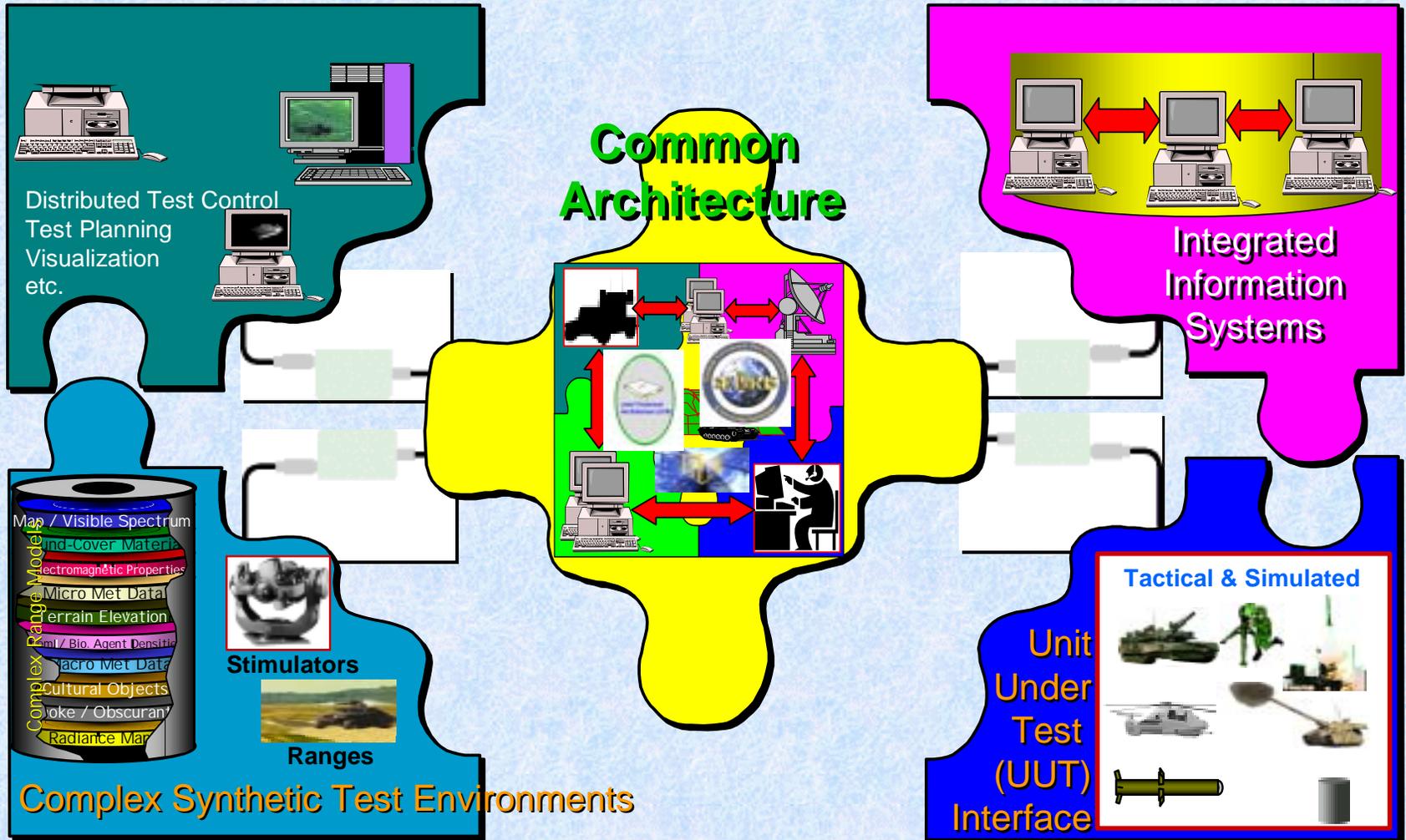
ATEC Locations



Personnel
709 Military
4233 Civilian
4686 Contractor



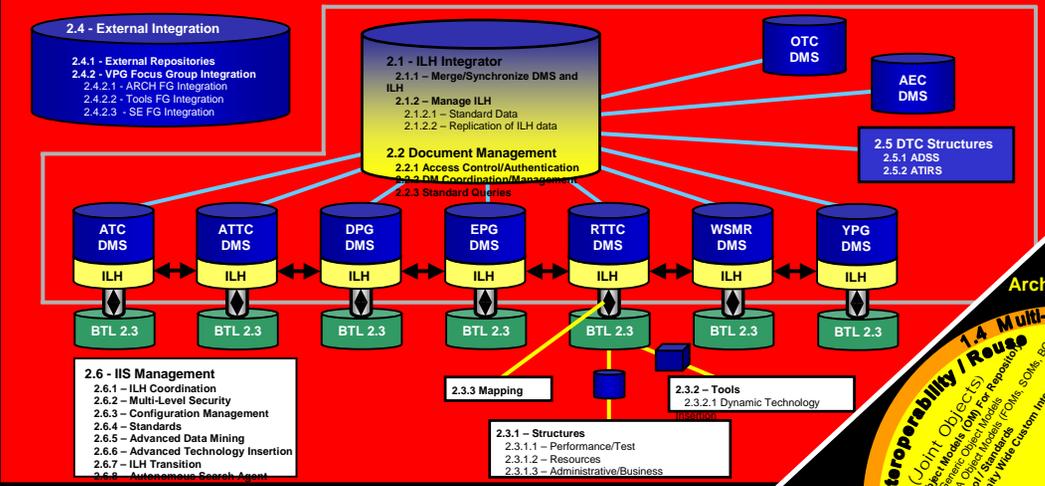
Top Level View of VPG



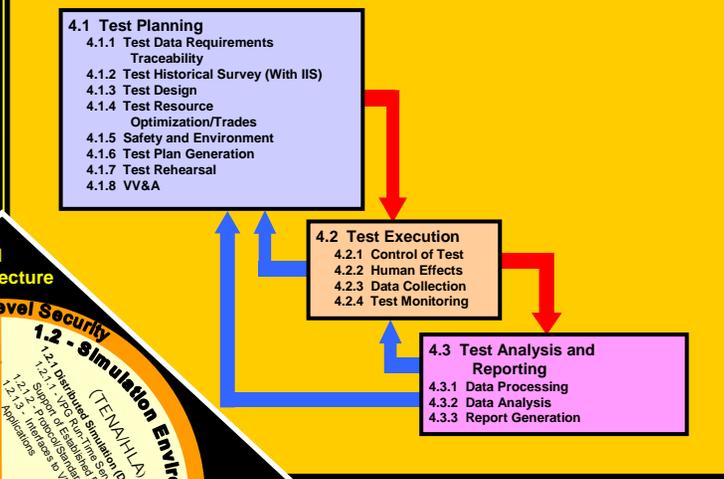
Placed in Motion With Common Computing and Communications Backbone

Virtual Proving Ground Blueprint

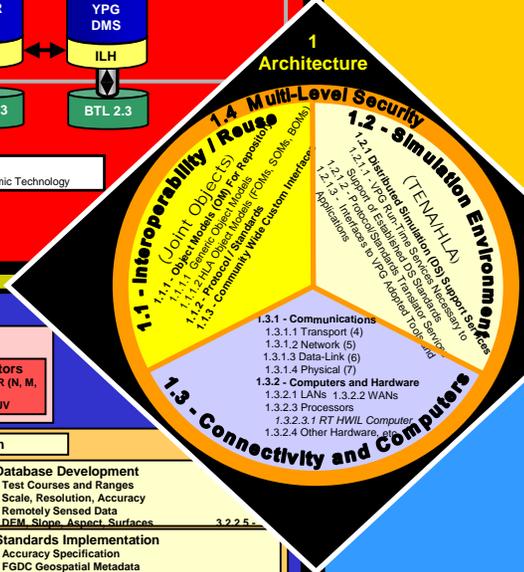
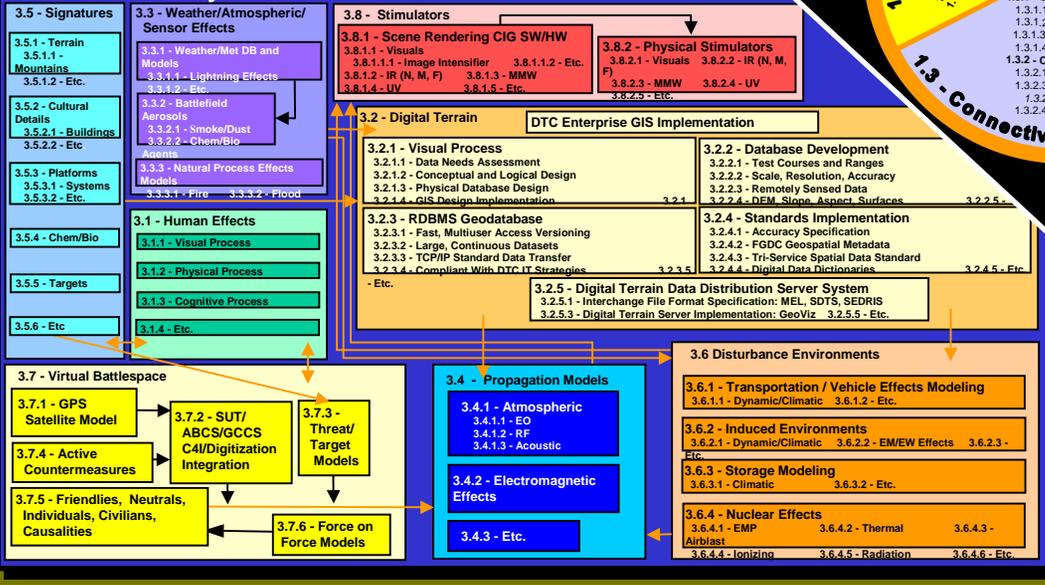
2. - IIS Development and Operations



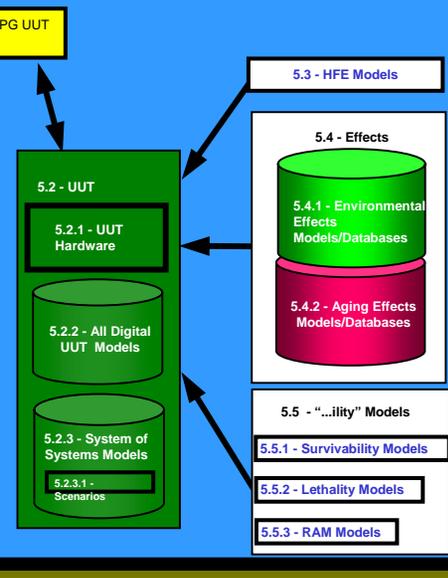
4. - Common VPG Test Tools



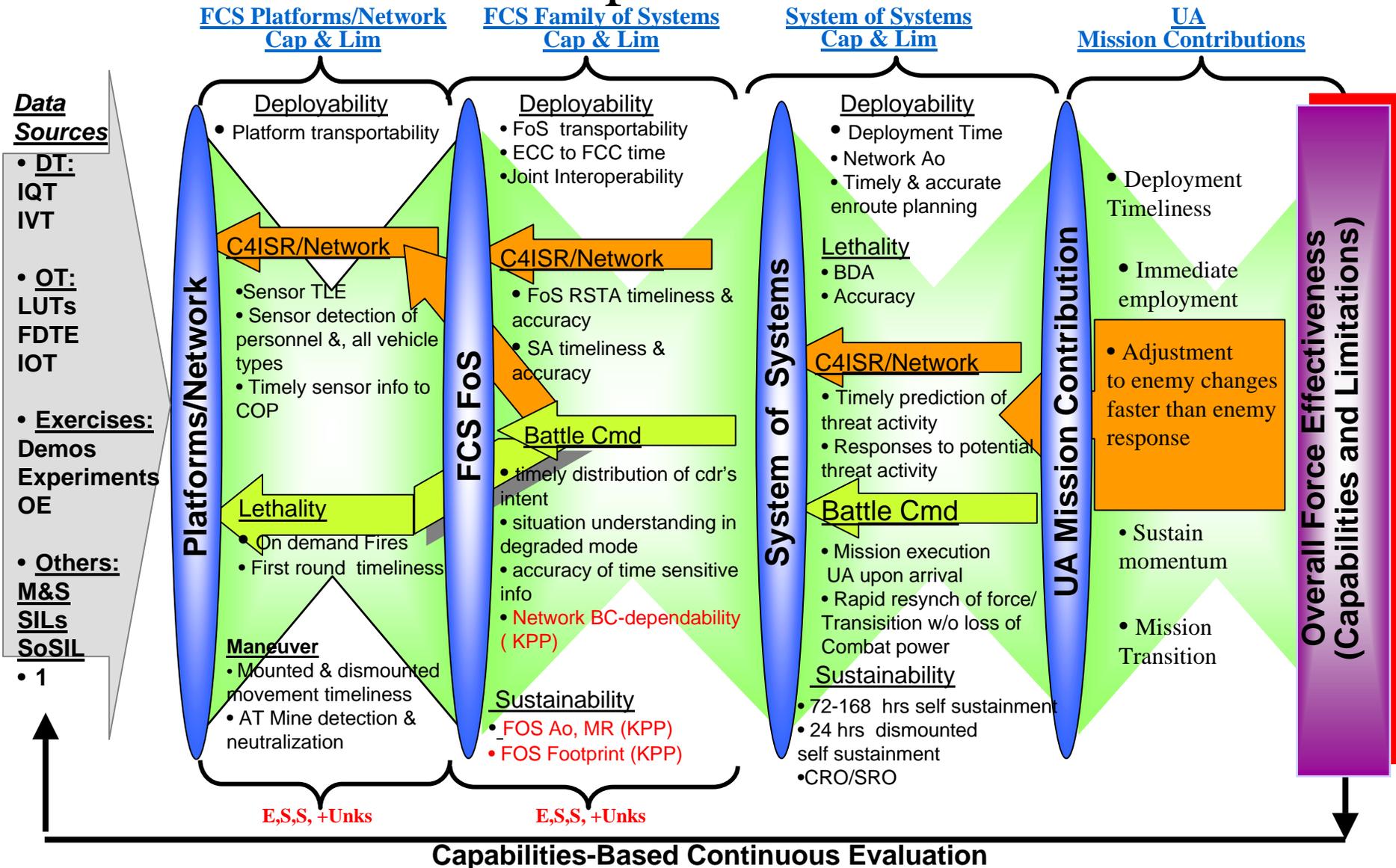
3. - Common Synthetic Environments



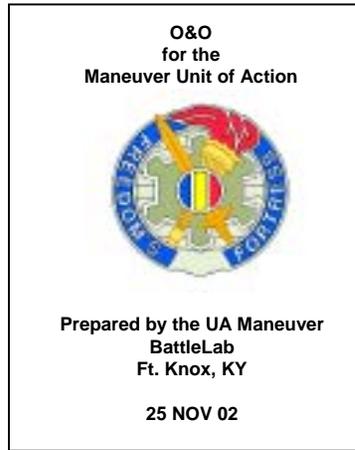
5. - Unit Under Test Interface



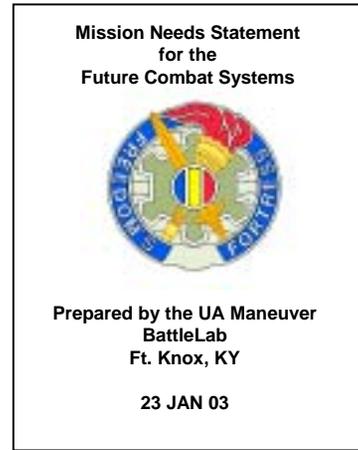
FCS Evaluation Strategy Responsiveness



TRADOC UA / FCS Products, FY 03



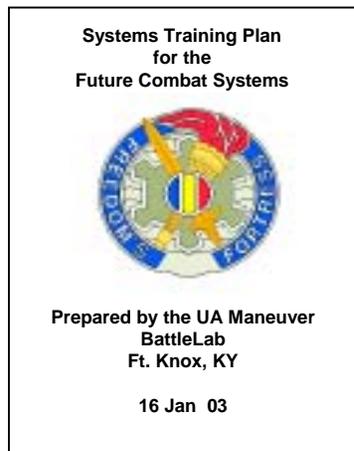
**UA Operational & Organizational
Plan, Change 1, 25 Nov 02
Change 2, 30 Jun 03**



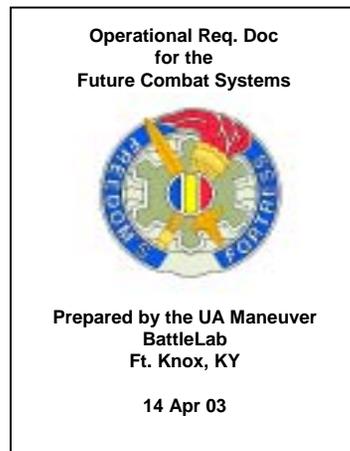
FCS Mission Need Statement, JROC validated, 23 JAN 03



FCS System Threat Assessment Report, DIA validated, 24 JAN 03



**Unit of Action
System Training Plan,
16 Jan 03**



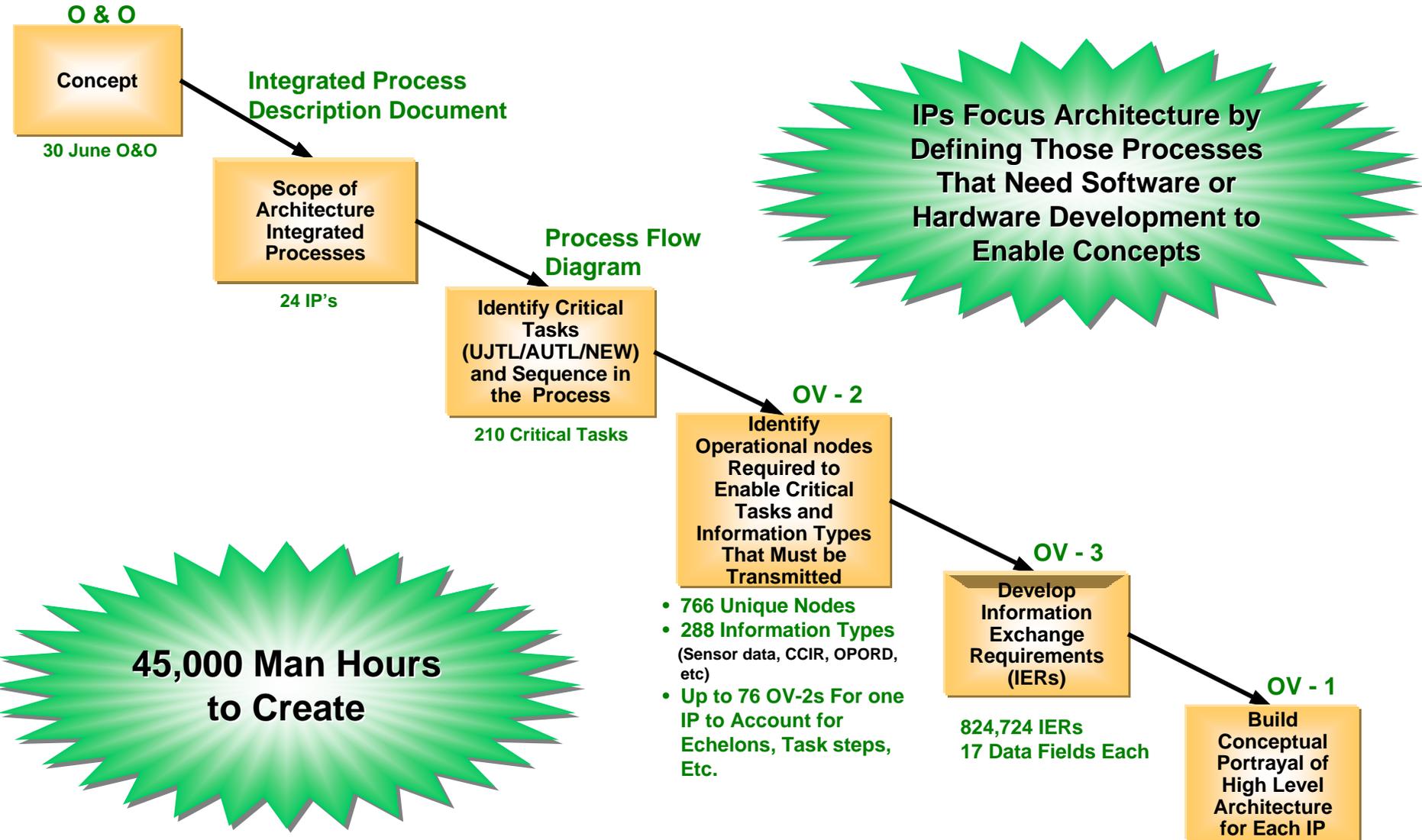
FCS Operational Requirements Document, JROC validated & approved, 14 Apr 03



Unit of Employment Concept, TRADOC Pam 525-3-92 2 Jun 03

Evaluation Strategy

IP Development



Each IP is horizontally integrated to show Connections to Other IPs, Higher HQ, Joint HQs and Assets



DOD Architecture Views

OV-1 High Level Operations Concept Description

OV-2 Operational Node Connectivity Description

OV-3 Operational Information Exchange Matrix

OV-4 Organizational Relationships Chart

OV-5 Activity Model

OV-6a Operational Rules Model

OV-6b Operational State Transition Description

OV-6c Operational Event-Trace Description



UAMBL Recommended UA/FCS Integrated Processes

FCS Force Development IPT

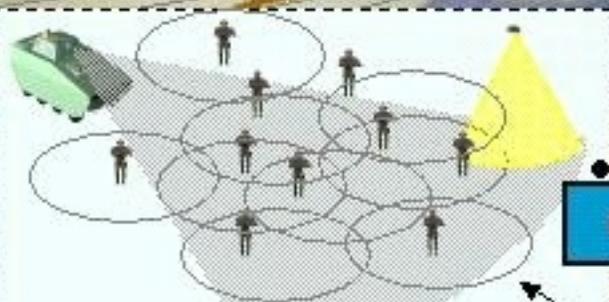
- *1. Exercise Battle Command
 - Execute Battle Command On the Move
 - Establish and Maintain Access to the Network
 - Centric Information Environment (DIDb)
- * 2. Establish/Maintain/Manage Sensors
- * 3. Conduct Networked Fires
 - Employ Non-Lethal Effects
 - Employ Lethal Effects
 - Conduct BDA
- * 4. Create/Maintain COP
 - Perform Information Fusion/Pattern Analysis
 - Disseminate/Present Intelligence
 - Disseminate CBRN Hazards
 - Provide Battlespace Situational Awareness
- * 5. Establish/Maintain Networks
 - Conduct Network Operations Management
 - Establish/Maintain Communication Networks
- 6. Perform A2C2
 - Perform Army Air/Ground Integration
- 7. Provide Maintenance
- 8. Provide Resupply
- 9. Perform Air Defense
- 10. Conduct Multi-Mode Training
- 11. Provide Force Health Protection
 - Provide Medical Support
- * 12. Execute Combat Identification
- 13. Provide Assured Mobility
- 14. Conduct Cooperative Engagements
 - Avenge Kill
 - Point and Shoot
- 15. Conduct Survivability Operations
 - Neutralize CBRN Hazards
 - Conduct Countermine Operations
- 16. Conduct Tactical Maneuver
 - Conduct Tactical Maneuver Dismounted
 - Conduct Tactical Maneuver Mounted
- 17. Conduct Vertical Maneuver
 - Conduct Air Assault Operations
 - Operational Maneuver
- * 18. Conduct Robotic Operations (Employ Unmanned Systems)
 - Remote Control of Manned Systems
 - Employ UAVs
 - Employ SUGVs
 - Employ UGVs
 - Employ UGSs
- 19. Deploy the Unit of Action
- 20. Conduct Intelligence Operations
 - Analyze, Process, Produce Intelligence
 - Collect Intelligence
 - Plan and Direct Intel Activities
- 21. Provide for Information Assurance
- 22. Establish Soldier System Interface
- * 23. Establish Interoperability (JIM / Current / Stryker / Objective)
- 24. Conduct Information Maintenance

* *Priority for SVF Architecture efforts: 1-5, 12, 18, 23*

Priorities based primarily on available data

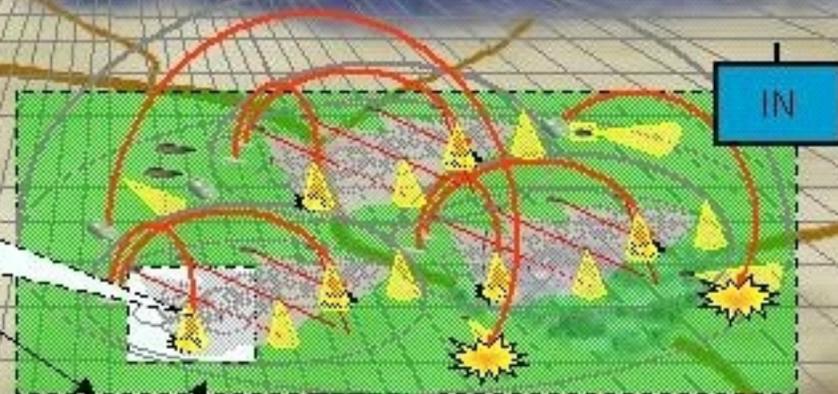
IP 2: Establish/Maintain/Manage Sensor Networks OV-1

- Co Cdr can pre-set criteria for downward/upward information flow
- Layered building blocks of information



Soldier to Platoon

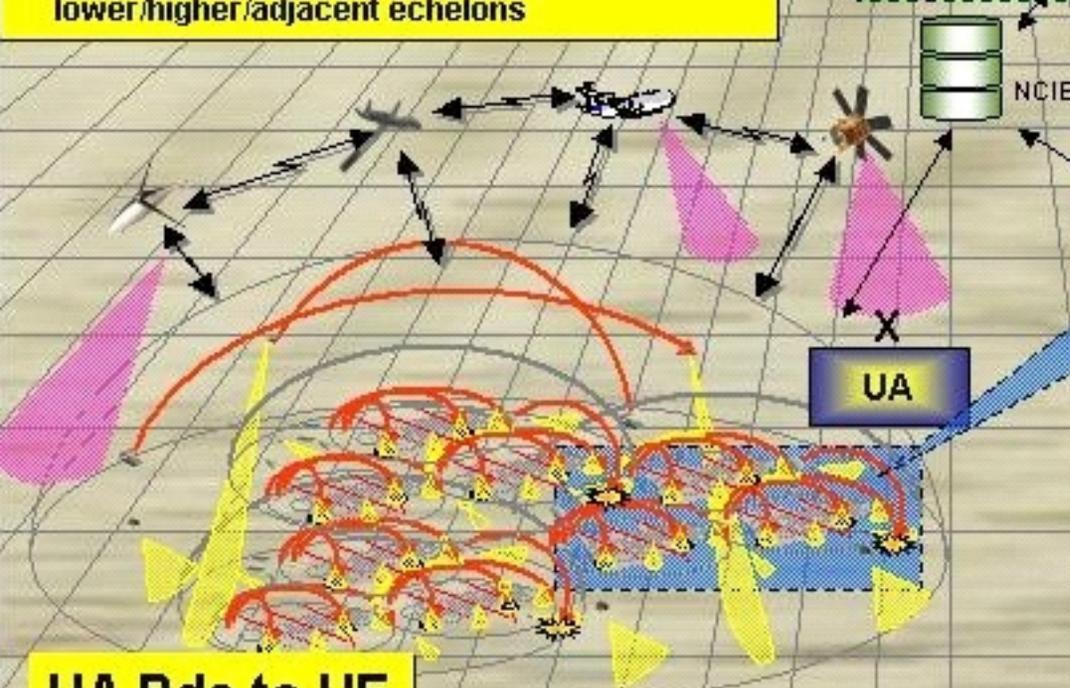
- Small unit sensor grid creates a sphere of SA
- Automated reporting to/from lower/higher/adjacent echelons



Layered Sensors at Bn & Bde

- UA Bn & Bde Cdrs set criteria for information flow
- UA/UE/JTF feeds filtered to prevent info overload
- UA linkage to UE, Joint, and National assets
- Automated fusion / Pattern Analysis process
- Layered approach supports Battle Command
- Provides information to the NCIE/COP

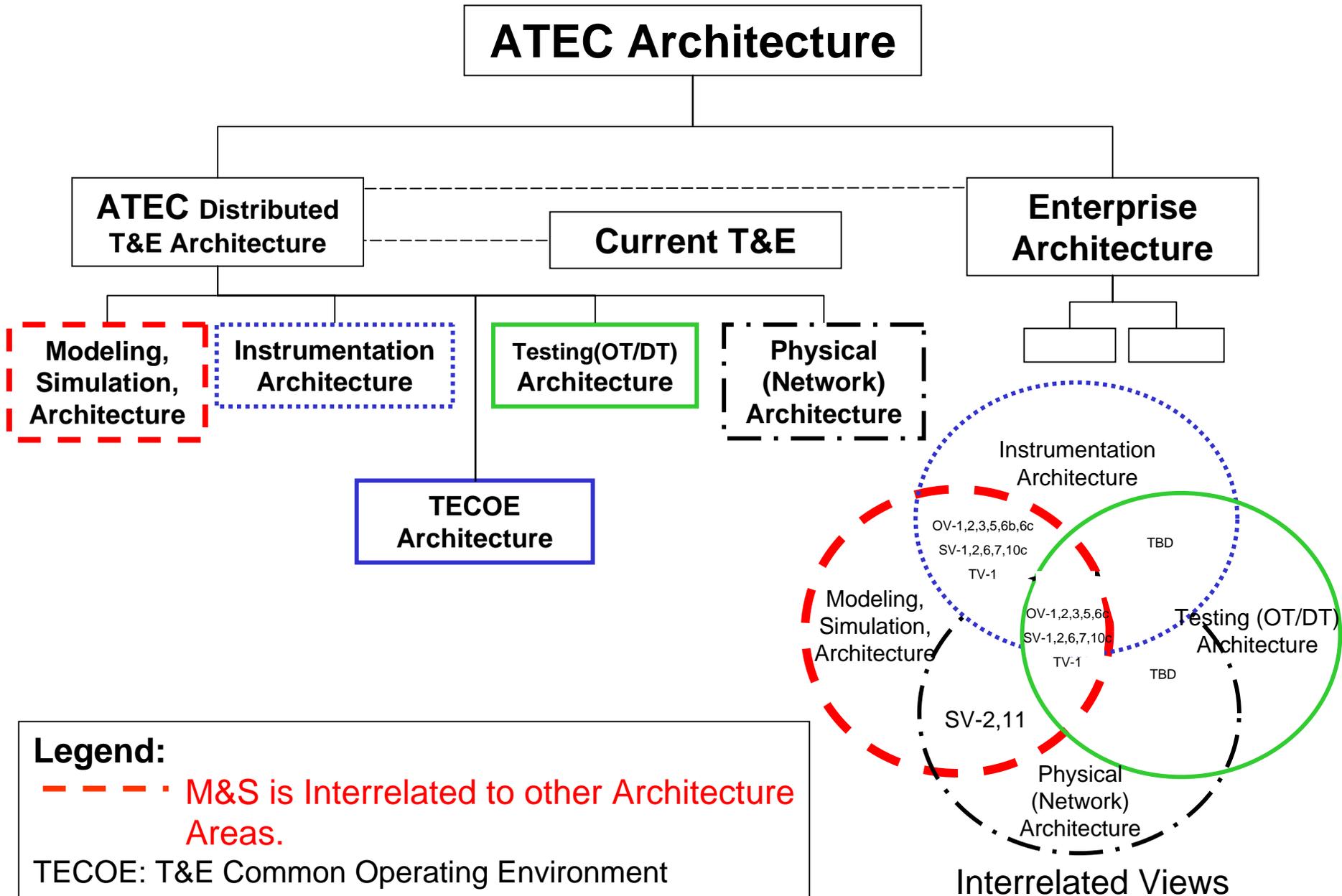
UA Bde to UE

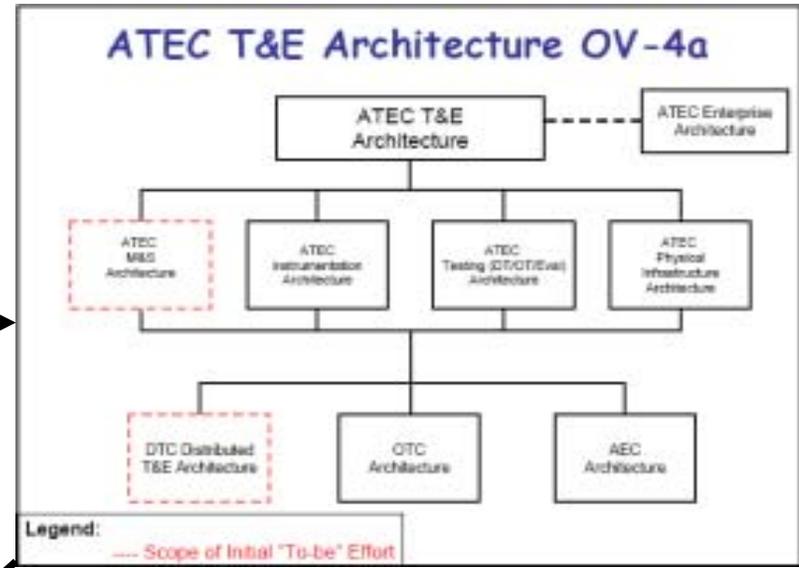
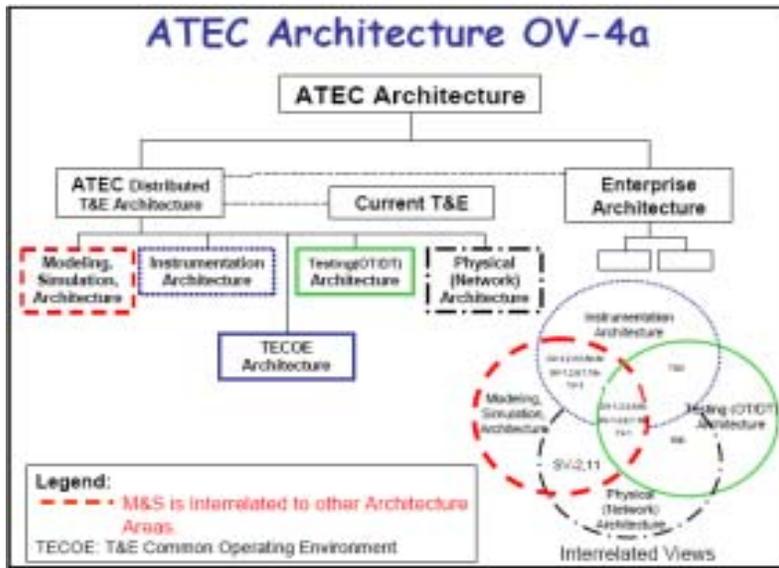


UoA OV-3 (NWF)

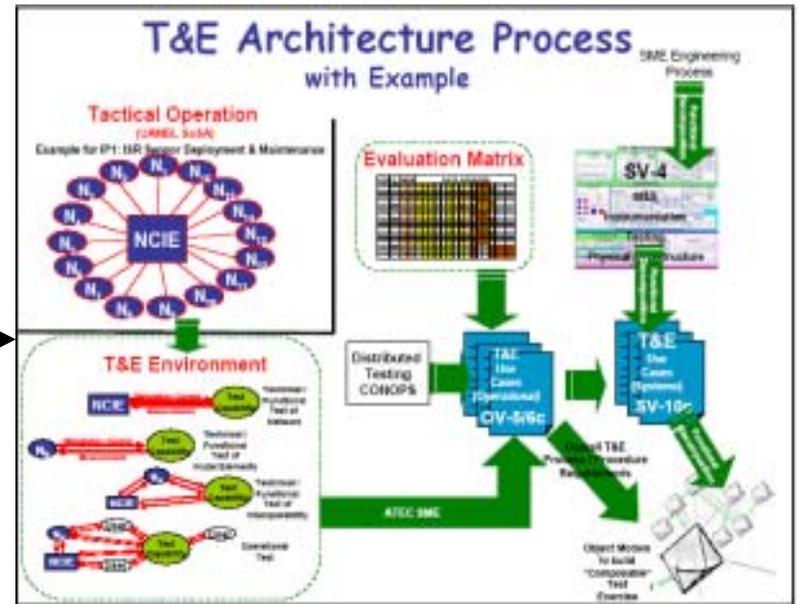
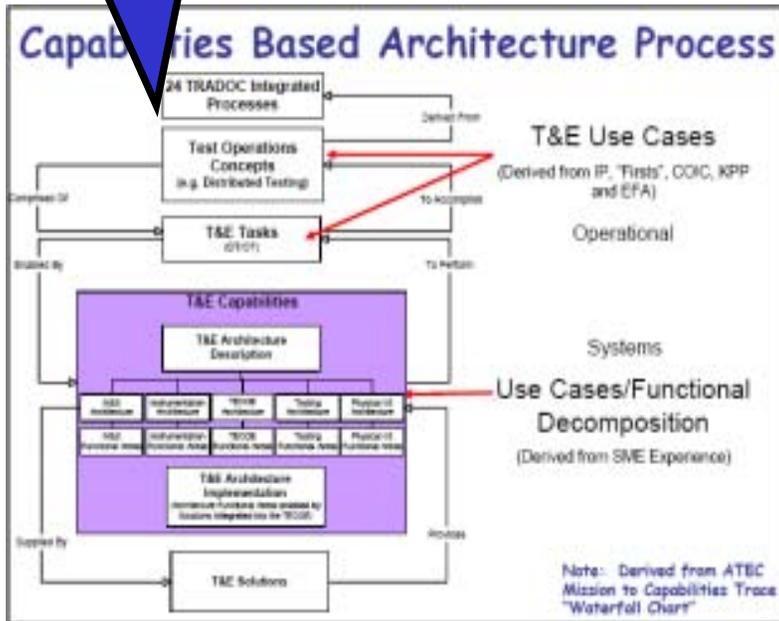
Integrated Process	Echelon View of the Process	Task Ref Number	Previous Step	Activity Name (Receiver Task)	Activity Description	Receiver Node	Receiver Echelon	Event	Information Characterization	Purpose	Sender Node	Sender Echelon
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	ROE Implementation	Provide Constraints	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	Attack Guidance Matrix	Asset Management	UA FEC	BDE
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	UA FEC	BDE
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	EN Situation Update	Enemy Threat and Capability	DIDb	BDE
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	EN Situation Update	Enemy Threat and Capability	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	EN Situation Update	Enemy Threat and Capability	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	EN Situation Update	Enemy Threat and Capability	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	FS Overlay and Annex	Asset Management	NLOS BN CIC	BN
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	NLOS BN CIC	BN
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	NLOS BN CIC	BN
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	NLOS BN CIC	BN
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	ATO	Asset Management	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	UE / JTF CIC	UE / JTF
Networked fires	BDE	2	1	A4.3.2 PERFORM TARGET DEVELOPMENT AND SUPPORT TO TARGETING [ART 1.3.2]		UA ISC	BDE	Target Request	COORD	Asset Management	UE / JTF CIC	UE / JTF

ATEC Architecture OV-4a

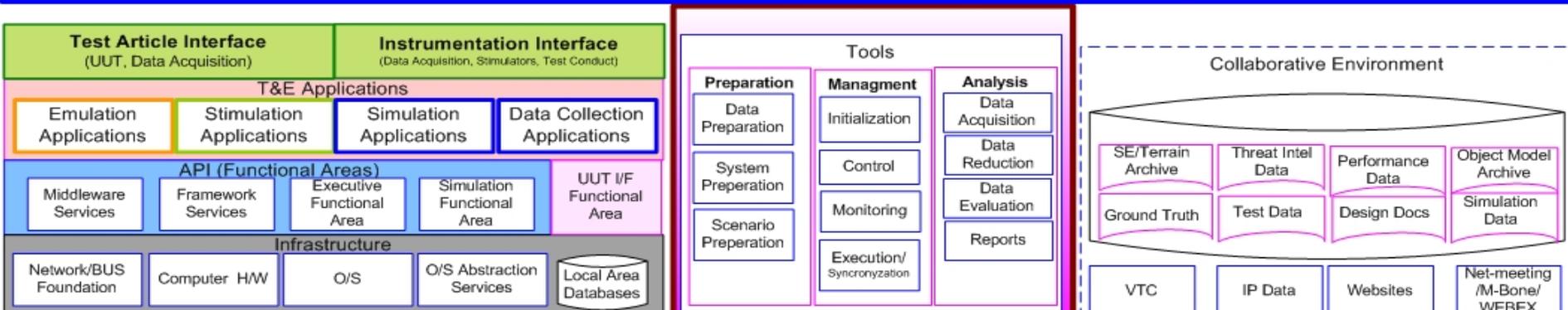
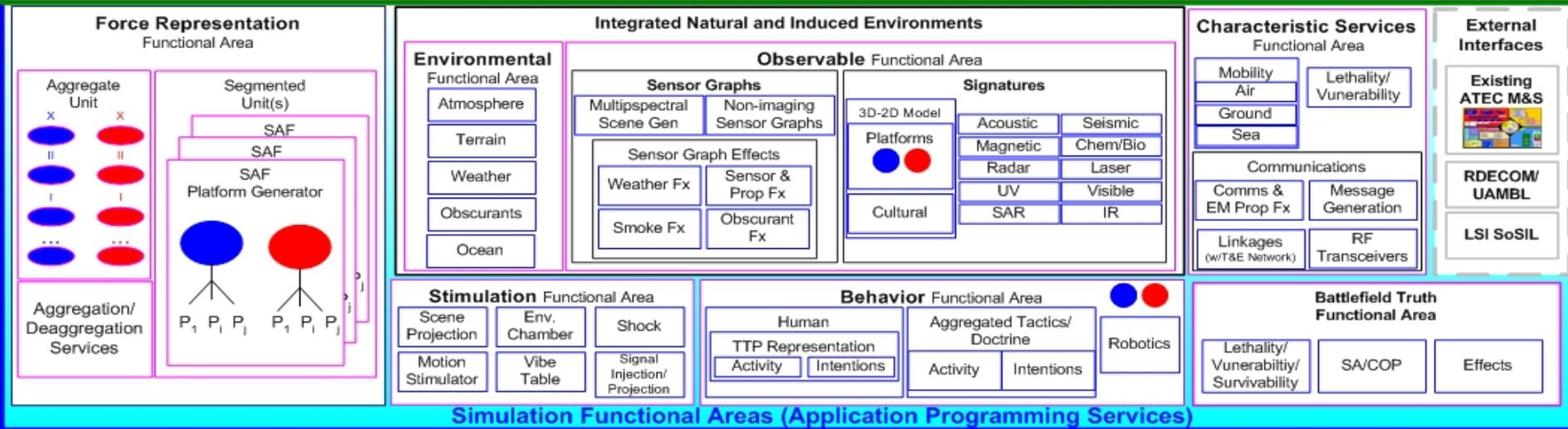
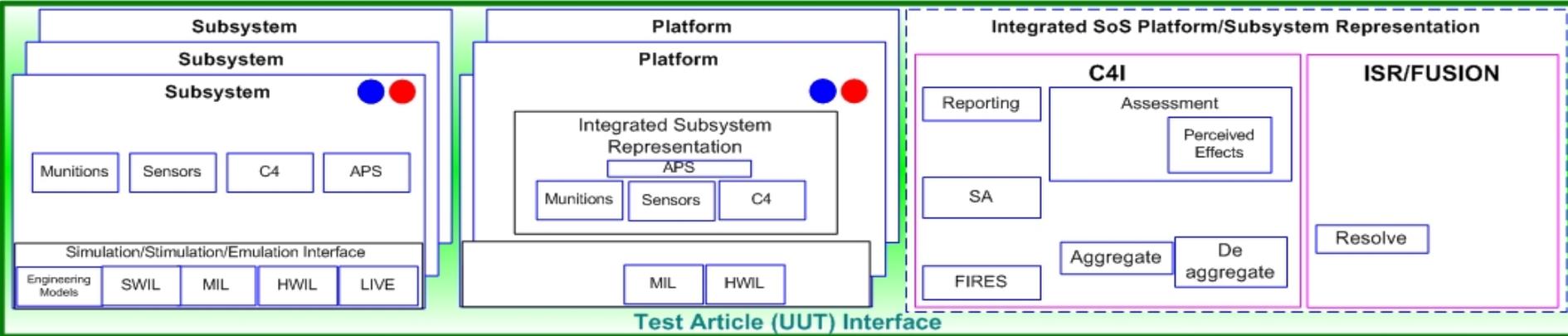




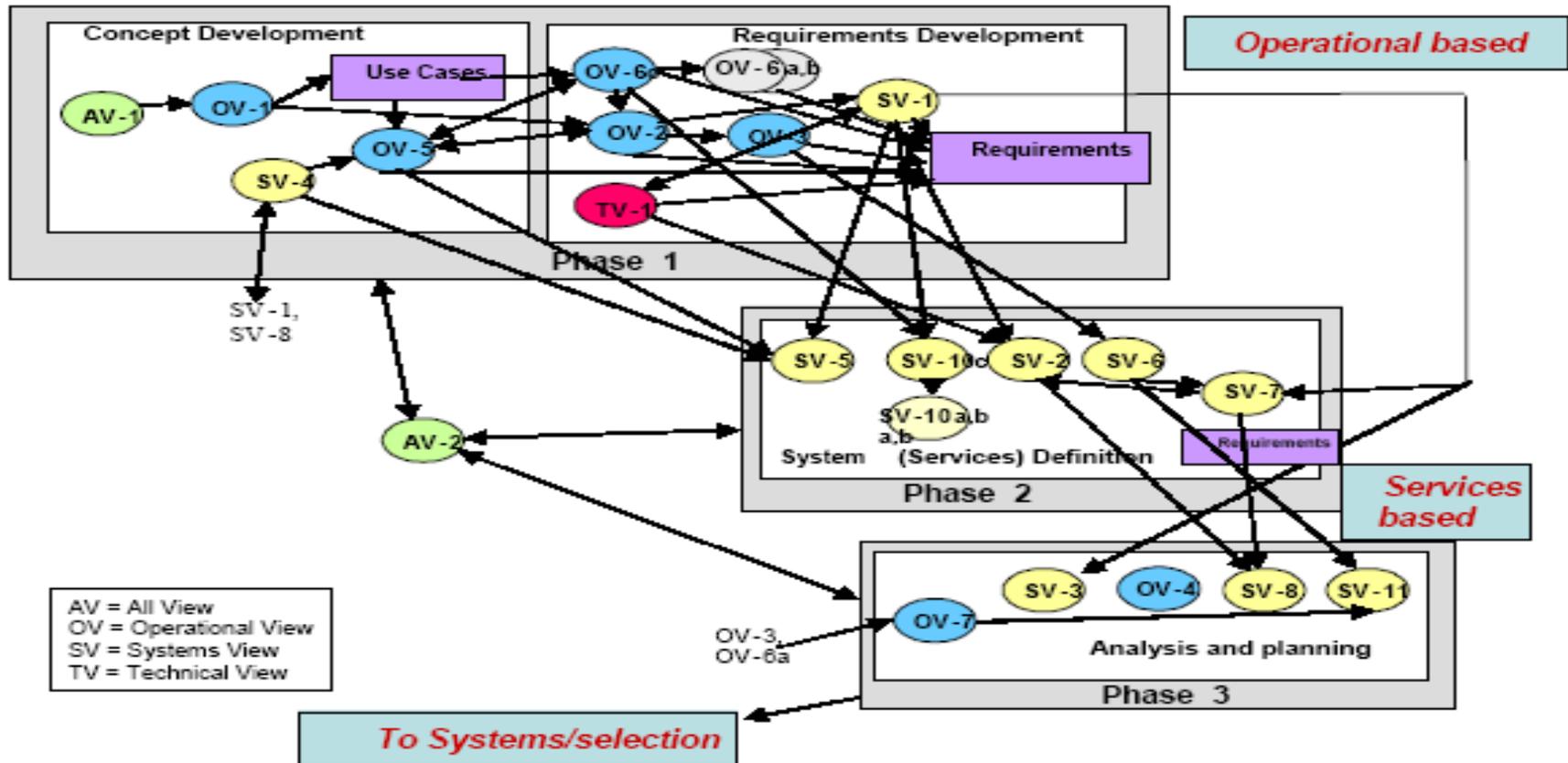
24 IPs



A TEC Test Architecture SV-4



DODAF Development Plan "TO-BE"



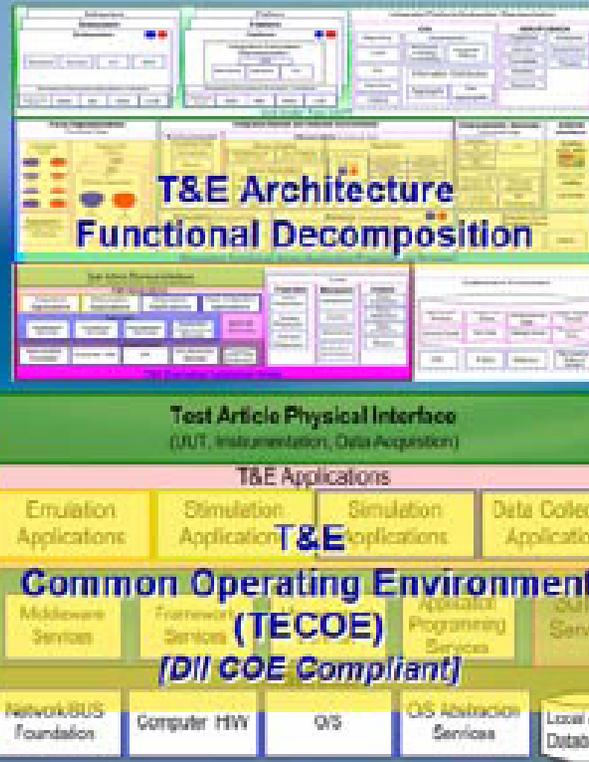
Objective Distributed T&E Architecture

Go From This

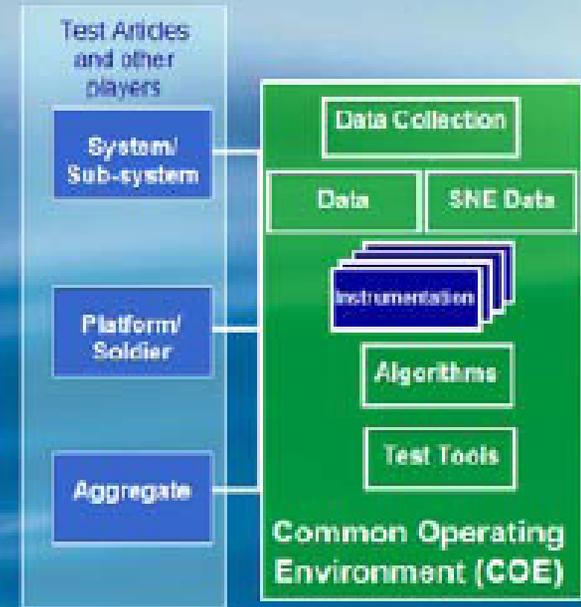


To This...

Today "AS-IS"



Objective "TO-BE"



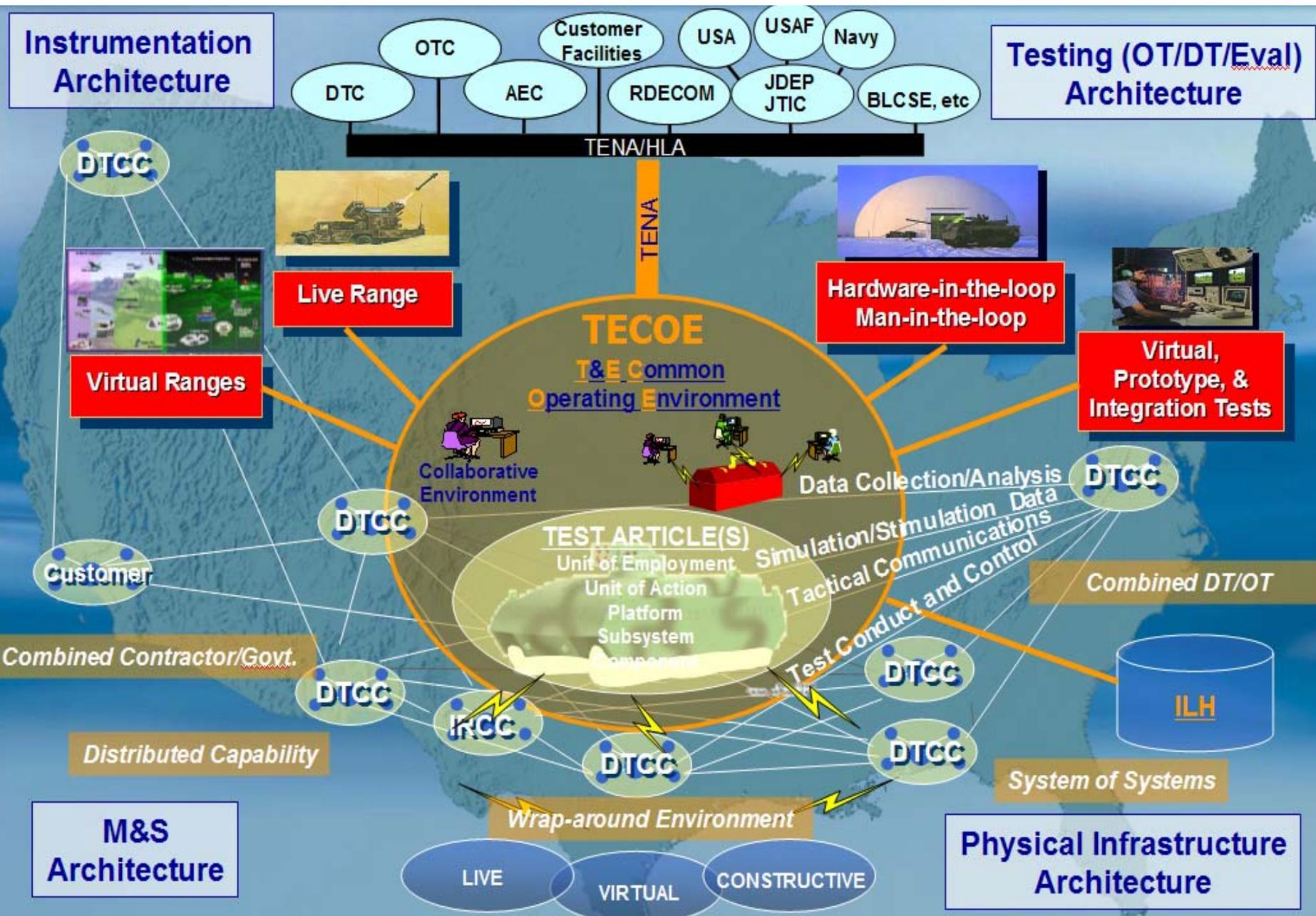
- Self Contained Capabilities
- "Solution" not requirement based
- Redundant Tools
- Different Algorithms
- Non-standard Databases etc.
- Non-exposed interfaces

- T&E Architecture
- SME's populate services with domain expertise
- Common Services (functional area decomposition)
- Exposed interfaces
- T&E Common Operating Environment (TECOE)
- Completely Open Architecture based on DSSA

- Scale and fidelity to meet the problem
- Common Architecture across domains
- Maximum Tool Reuse
- DT in an OT/mission environment
- Middleware INDEPENDENT OM

Structure the requirements/specifications to drive the solutions

ATEC Distributed T&E Architecture OV-1





Summary

- Mission-to-Task Decomposition is a potentially valuable tool for determining test infrastructure requirements.
- The DoD Architecture Framework is a valuable tool for articulating the relationships between mission requirements and test and evaluation requirements.
- The information that feeds standard databases is becoming more useful and more usable, so it needs to be accurate!