RAPID FORCE PROJECTION INITIATIVE ADVANCED CONCEPT TECHNOLOGY DEMONSTRATION:
THE EXPERIMENTAL PATH

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CONTENT

- What is the Department of Defense's Advanced Concept Technology Demonstration program?

- What is the Rapid Force Projection Initiative?

- What is the Experimental Structure of RFPI?

- Development of Live/Virtual Simulation/Stimulation for Ft. Benning Field Exercise

- ** Video of Ft. Benning Field Experiment **

Objectives of an ACTD

- Conduct demonstrations of Systems' Capabilities
  - User defined measures of effectiveness and measures of performance (MOEs/MOPs)
  - User provided or approved operational exercises
- ACTD provides means to develop, refine, and optimize new warfighting concepts: operation, tactics, and doctrine
- ACTD must evaluate the military utility of proposed solutions to meet critical military needs
- Prepare to transition into acquisition
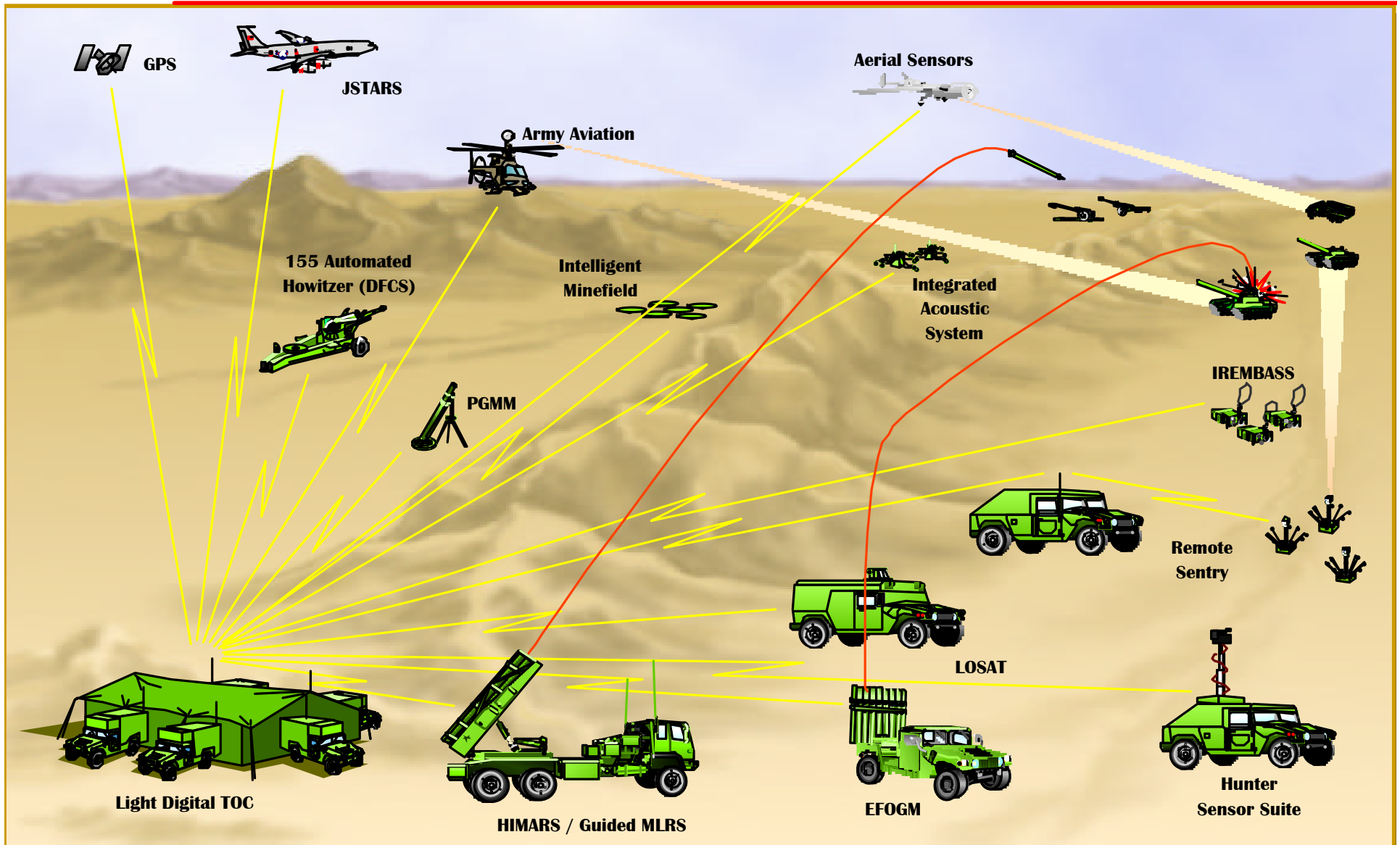
Rapid Force Projection Initiative

- The use of U.S. forces in Contingency Operations requires the ability to respond quickly to unanticipated challenges to our interests around the globe.
- The RFPI ACTD demonstrates:
  - Real time targeting from forward sensors to stand-off killer weapon systems with the capability to engage high value targets, including heavy armor, beyond traditional direct fire range
  - Airlift constrained power projection capability for early entry forces as deployable as current forces
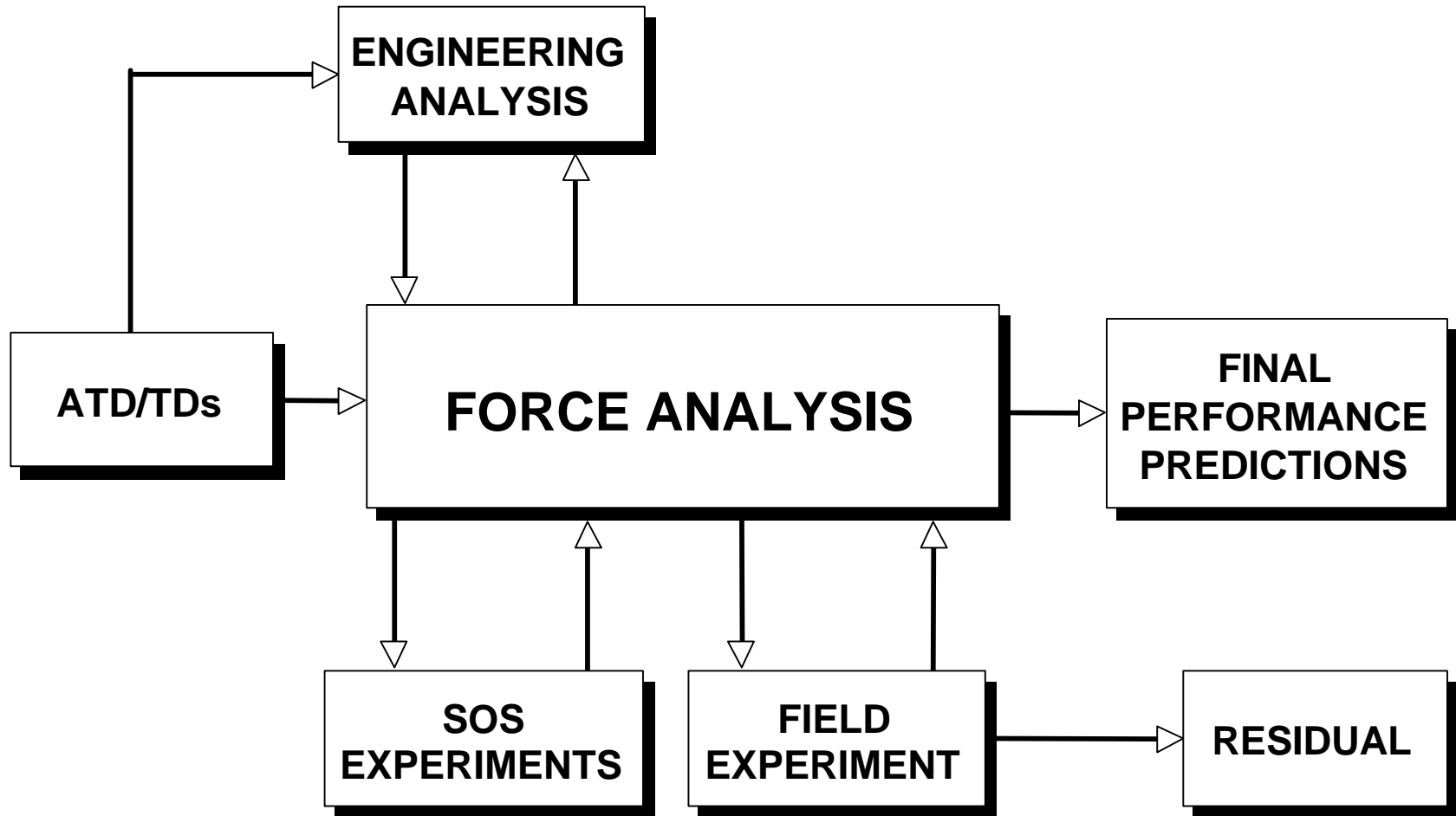
Rapid Force Projection Initiative

- RFPI is based on the Hunter-Standoff Killer (HSOK) operational concept. A semi-automated target transfer from forward sensors (Hunters) to weapons systems (Standoff Killers) using command, control and communications (C3) integration significantly expands the engagement battle space of the Brigade.

- Utility evaluation and exploration of emerging warfighting doctrine are accomplished through a series of TRADOC sponsored Battle Lab Warfighting Demonstrations and Experiments, live and in simulation.

RAPID FORCE PROJECTION INITIATIVE

RFPI
RAPID FORCE PROJECTION INITIATIVE

GPS

JSTARS

Aerial Sensors

Army Aviation

155 Automated
Howitzer (DFCS)

Intelligent
Minefield

Integrated
Acoustic
System

IREMBASS

PGMM

Remote
Sentry

LOSAT

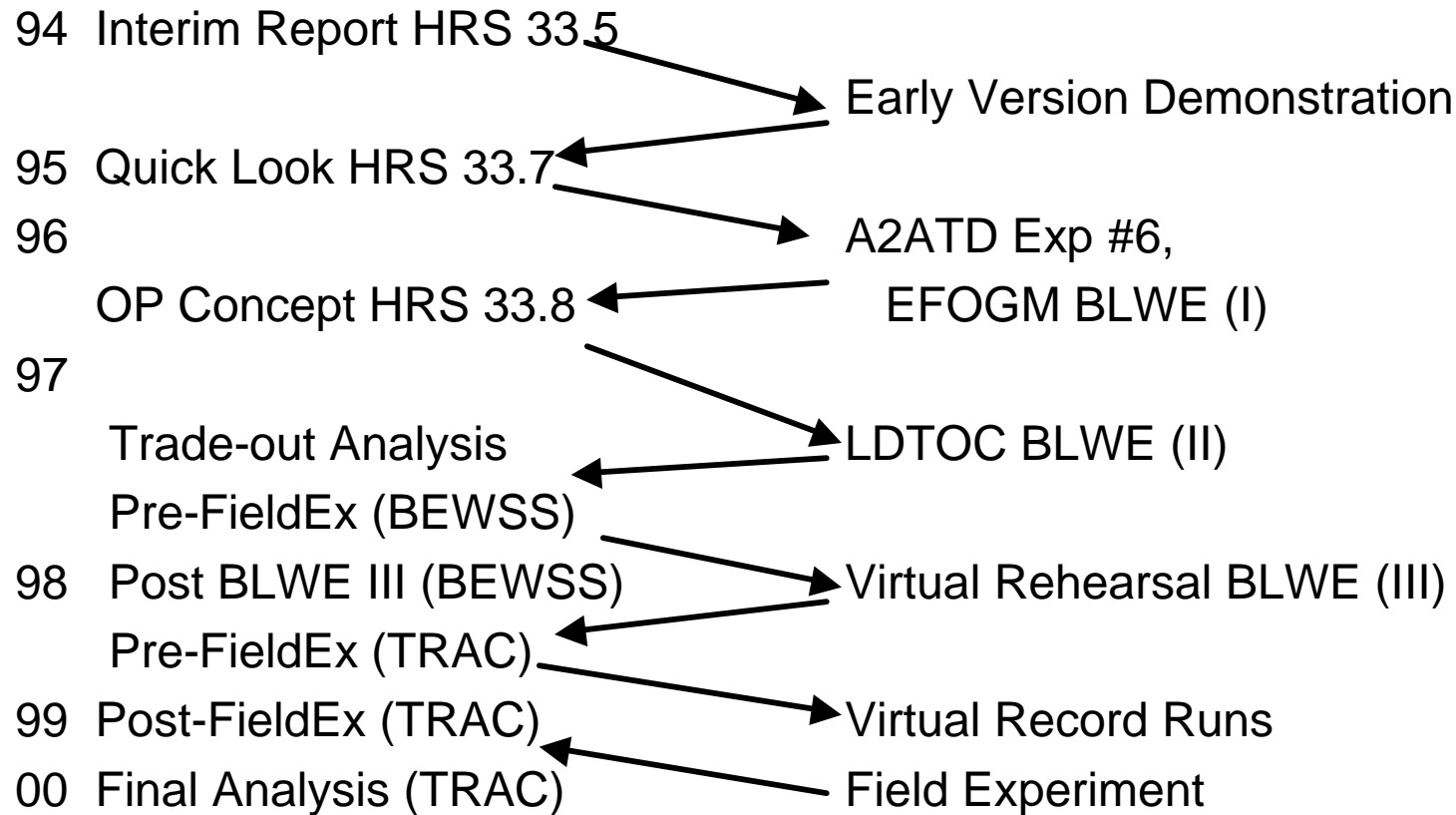Light Digital TOC

HIMARS / Guided MLRS

EFOGM

Hunter
Sensor Suite

RFPI MODEL - EXPERIMENT - MODEL (M-E-M) ANALYTICAL PROCESS

RFPI Model-Experiment-Model (M-E-M) Iterations

FY	Analysis	Experiment
94	Interim Report HRS 33.5	
		Early Version Demonstration
95	Quick Look HRS 33.7	
96		A2ATD Exp #6,
	OP Concept HRS 33.8	EFOGM BLWE (I)
97		
	Trade-out Analysis	LDTOC BLWE (II)
	Pre-FieldEx (BEWSS)	
98	Post BLWE III (BEWSS)	Virtual Rehearsal BLWE (III)
	Pre-FieldEx (TRAC)	
99	Post-FieldEx (TRAC)	Virtual Record Runs
00	Final Analysis (TRAC)	Field Experiment

RFPI Analytical Products

The final analytic products of the RFPI ACTD will be a set of five assessments presented to DUSD (AT)

- OPTEC Assessment.

- FORSCOM User Assessment.

- TRADOC User Assessment.

- Engineering Assessment.

- and TRAC-WSMR Performance Assessment, to include the TRADOC Utility Assessment, the Residual Assessment, the Field Exercise Assessment and the Constructive Force Effectiveness Analyses.

RFPI - OBJECTIVES OF LIVE/VIRTUAL ARCHITECTURE-

EXPAND THE LIVE FIGHT TO BLUE DRB VERSUS RED DIVISION
• REPRESENT ENTIRE COMPLIMENT OF LIVE AND VIRTUAL ENTITIES IN VIRTUAL DOMAIN

ENABLE INTERACTION OF LIVE AND VIRTUAL ENTITIES
• REPRESENT ALL MUNITIONS FIRING, DETONATIONS, AND CASUALTIES IN VIRTUAL DOMAIN
• INFORM LIVE ENTITIES OF THEIR DAMAGE STATUS
• REFLECT DIRECT-FIRE MILES CASUALTIES IN VIRTUAL DOMAIN
• SYNCHRONIZE LIVE AND VIRTUAL TARGET ACQUISITIONS AND BDA
• TRANSITION ONE VIRTUAL BATTALION OF OPFOR TO LIVE OPFOR AT RANGE BOUNDARY
• INTERFACE WITH LIVE OPFOR VOICE NETWORKS

STIMULATE BRIGADE C4I
• REPRESENT CRITICAL VIRTUAL OPFACS TO PARTICIPATE ON TACTICAL VOICE NETWORKS
• REPRESENT CRITICAL VIRTUAL OPFACS TO PARTICIPATE ON TACTICAL VMF NETWORK
• STIMULATE ATCCS SYSTEMS TO THE DEGREE SUPPORTED BY EXISTING STIMULATION TOOLS

SUPPORT EXERCISE CONTROL, DATA COLLECTION, AND ANALYSIS
• INTERFACE VIRTUAL ENVIRONMENT OC'S TO LIVE OC VOICE NETWORK
• ACCUMULATE AND DISPLAY BATTLE VIEWS AND STATISTICS
• INTEGRATE WITH EXPERIMENTAL CONTROL AND INSTRUMENTATION CONTROL VIA VOICE AND   DIGITAL NETS
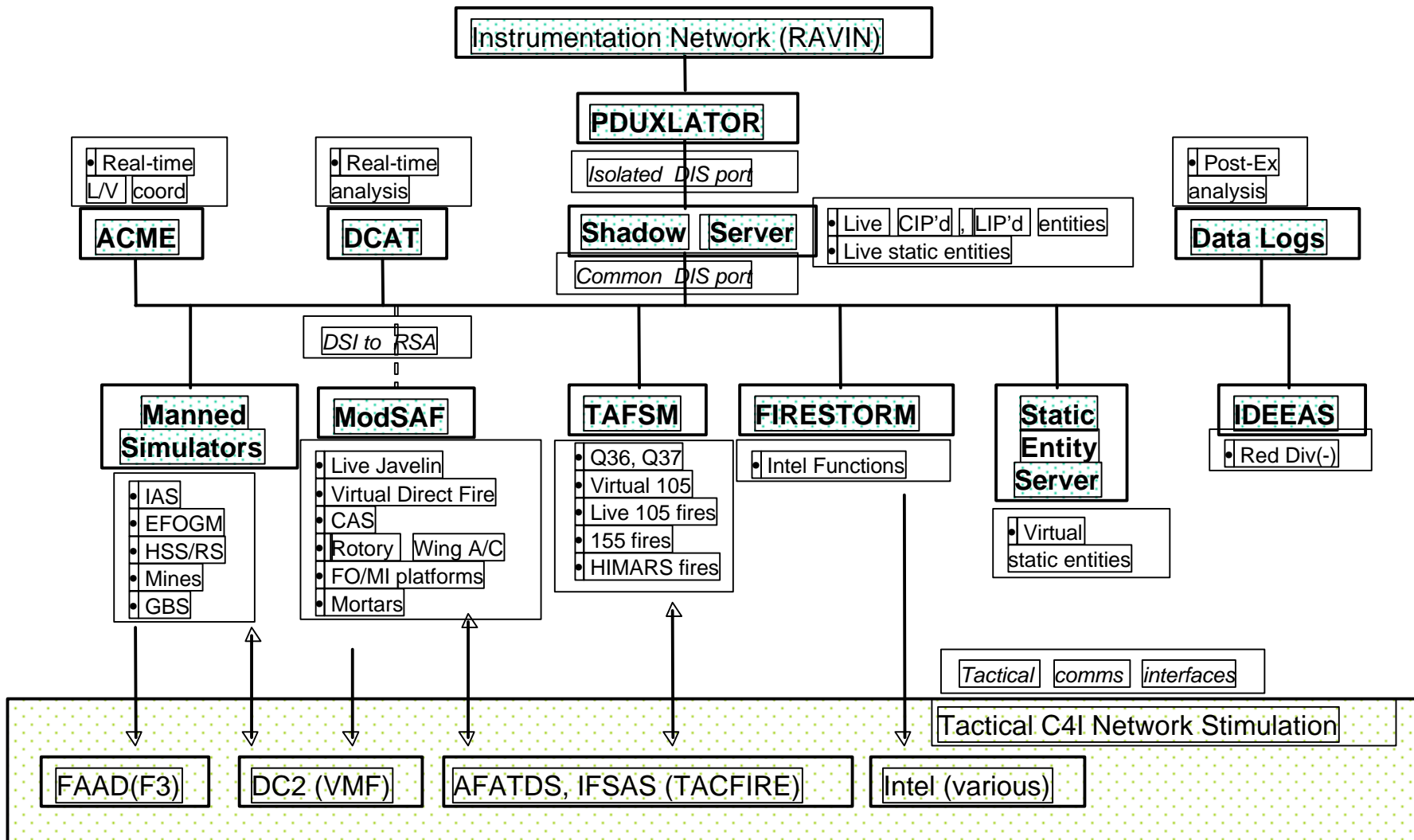

DO ALL OF THE ABOVE <u>IN REAL TIME</u>!!

RFPI ACTD LIVE/VIRTUAL SIMULATION

*DEVELOPED SIMULATION CAPABILITIES **ENABLING** RAPID FORCE PROJECTION INITIATIVE (RFPI) LIVE / VIRTUAL EXPERIMENTS*

- Interfaced live instrumentation to Distributed Interactive Simulation (DIS) backbone
- DIS integration of >1500 entities, combined live and virtual
- Developed "Shadow Server" concept to allow live/virtual interactions
- Shadow Server transitions virtual to live *real-time* across range boundaries
- Virtual C4I systems stimulate TFXXI digital networks
- Demonstrated first and only DIS Air Assault scenario
- Demonstrated portability to provide DIS battle to remote facilities
- Multiple models (ModSAF, TAFSM, IDEEAS, FIRESTORM, ITEMS) interoperable
- Analysis tools monitor Measure of Effectiveness (MOEs) *real-time* in experiments

RFPI SIMULATION ARCHITECTURE

Instrumentation Network (RAVIN)

PDUXLATOR

Isolated DIS port

Shadow Server

- Live CIP'd, LIP'd entities
- Live static entities

Common DIS port

- Real-time L/V coord

ACME

- Real-time analysis

DCAT

- Post-Ex analysis

Data Logs

DSI to RSA

Manned Simulators

- IAS
- EFOGM
- HSS/RS
- Mines
- GBS

ModSAF

- Live Javelin
- Virtual Direct Fire
- CAS
- Rotory Wing A/C
- FO/MI platforms
- Mortars

TAFSM

- Q36, Q37
- Virtual 105
- Live 105 fires
- 155 fires
- HIMARS fires

FIRESTORM

- Intel Functions

Static Entity Server

- Virtual static entities

IDEEAS

- Red Div(-)

Tactical comms interfaces

Tactical C4I Network Stimulation

FAAD(F3)　　DC2 (VMF)　　AFATDS, IFSAS (TACFIRE)　　Intel (various)

RFPI SIMULATION
-FIELD EXPERIMENT ACCOMPLISHMENT-

- **RFPI has just executed the most highly interactive live/virtual/constructive simulation exercise ever achieved or attempted**

- **in this Blue brigade versus Red Division fight, all combinations**

  of live or virtual system interactions were allowed

- **Blue C4I systems had completely seamless stimulation of digital**

  and voice traffic for ADA, maneuver, intel, and fire support

- **Virtual entities translated to live elements automatically,**

  with contiguous translation and correlation

- **No aggregation was used in this 1500+ entity fight, including the**

  first ever live/virtual air assault mission

RFPI HAS SHOWN THAT
DISTRIBUTED INTERACTIVE SIMULATION
WORKS FOR EXPERIMENTATION

RFPI Residual/Leave Behind Systems

- Hunters(Advanced Sensors):
  - Hunter Sensor Suite, Remote Sentry, Forward Observer/Forward Aerial Controller, Integrated Acoustic System
- Battle Command C4I:
  - Light Digital Tactical Operating Center
- Standoff Killers/ Munitions:
  - HIMARS, EFOGM, 155mm HOW Auto Fire Control System

Advanced Concepts - ATDs and TDs

- ATDs and TDs
  - Hunters (Advanced Sensors):Aerial Scout Sensor Integration
  - Standoff Killers/Munitions: 120mm MFCS & PGMM, IMF, LOSAT, Autonomous Intelligent Submunition (MSTAR Candidate)
- Other Science and Technology Programs
  - Standoff Killers/Munitions: Smart 105mm Munition (Terminally Guided Projectile), Low Cost Competent Munition, LOCAAS (MSTAR candidate)

Advanced Concepts - Acquisition Programs

- Hunters (Advanced Sensors):
  - Unmanned Ground Vehicle, Comanche
- Battle Command C4I:
  - AVTOC
- Standoff Killers/Munitions:
  - Follow-on to TOW, 155mm LTWT Auto HOW (ATCAS); 155mm Extended Range munition, P3I SADARM, Guided MLRS, BAT P3I (MSTAR candidate) ATACMs Blk III

EVD
OCT 94

RIVET
NOV 95

A2 ATD
JAN 96

LDTOC BLWE
APRIL 97

VR BLWE
SEPT 97

CPX
APRIL 98

FEPOP
JUNE 98

FE
AUG
98