



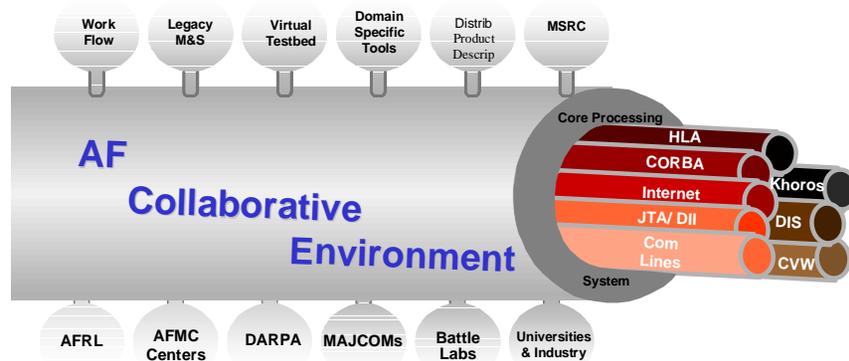
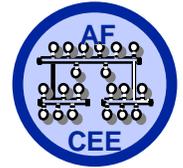
AFRL Collaborative Environment for Simulation Based Acquisition

Bill McQuay

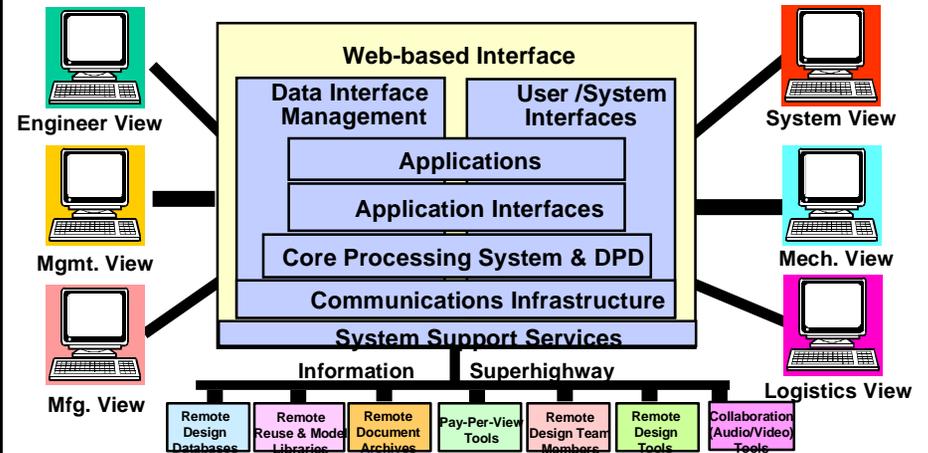
**Collaborative Simulation Technology Branch
Information Systems Division
Information Directorate
AF Research Laboratory**



Collaborative Enterprise Technology



Collaborative Environment Reference Architecture



Objectives:

To apply advanced simulation and information technology and engineering tools, including virtual testbeds, in an collaborative environment as a decision support system for

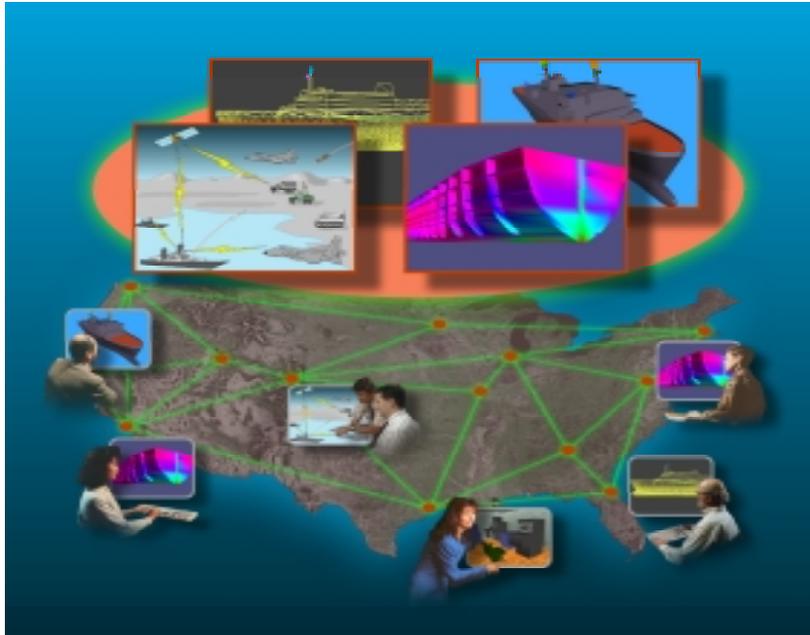
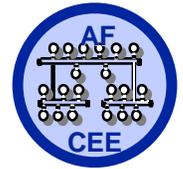
- Simulation Based Acquisition
- Cross domain technology development
- System design and test and evaluation
- Distributed mission training
- Strategy & Planning

Payoff:

- Framework for SBA collaborations
- Cross discipline, multiple domain sharing, integration & evaluation in a system of systems context
- Enables Virtual Engineering & Test
- Provides structure for cost of function/ performance affordability trades
- Enables collaboration with industry partners

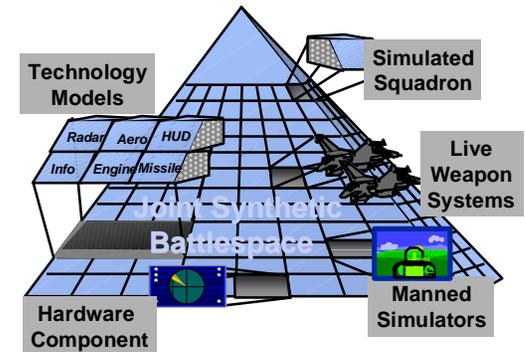


Simulation Based Acquisition

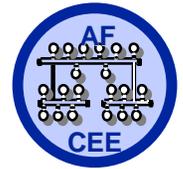


An Open, Distributed Collaborative System

- Integrated Product & Process Model
- Common Application Framework
- Underlying Communication Backbone
- Virtual Products In Synthetic Environments



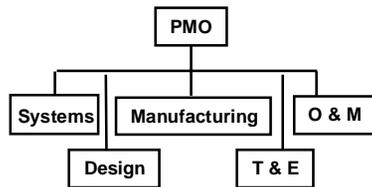
- A process supported by robust, collaborative use of simulation technology that is integrated across acquisition phases and programs
- “Try Before Buy” in a Virtual Environment
- Problem Solving Before System is Built & Across the Life Cycle
- Tying Together the S&T, Acquisition, and User Communities



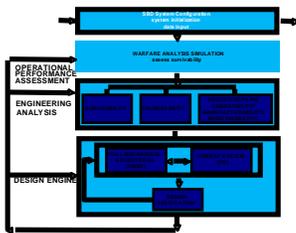
CEE Vision

Data → Information → Knowledge → Wisdom

Organization



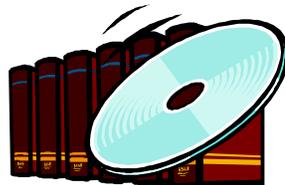
Engineering Process



Tools

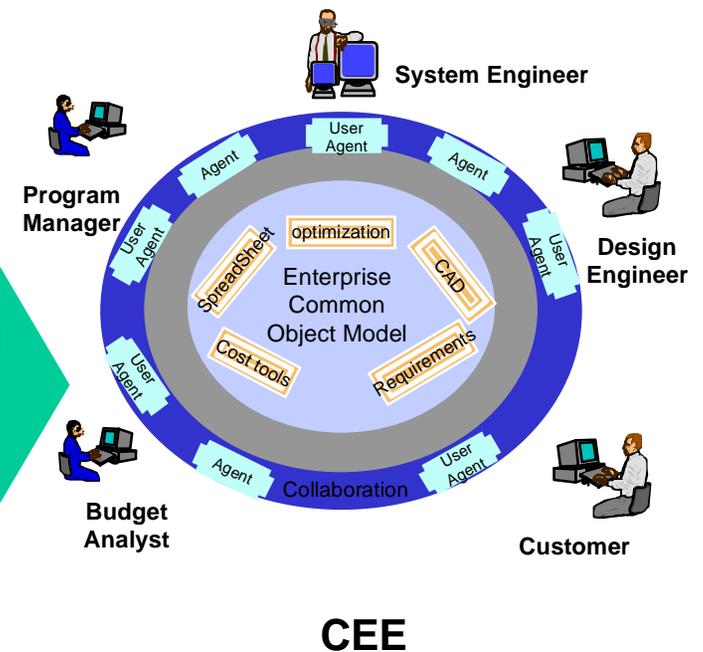


Data



Process for configuring a CEE

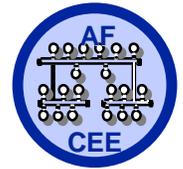
- Product/Process Model
- Tool Integration
- Data Mediation
- Work Flow
- Intelligent Agents
- Collaborative Framework





AFRL Collaborative Environment

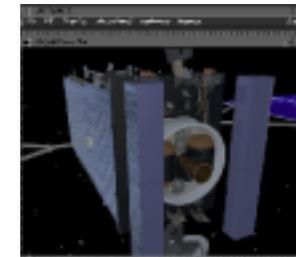
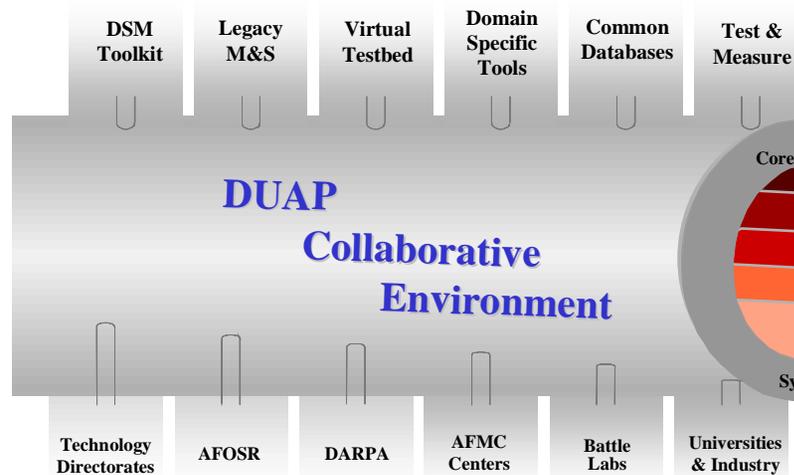
Leveraging DARPA SBD & DUAP CEE



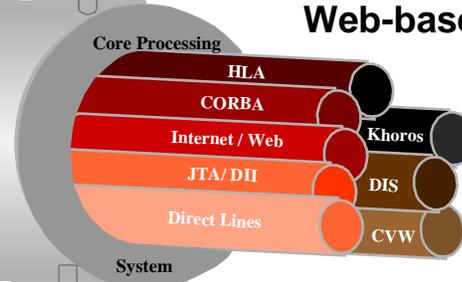
**Enterprise Common Object Model/
Smart Enterprise Model**



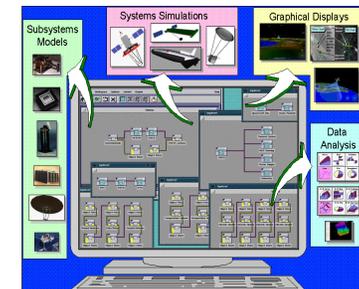
Workflow, Process Modeling, & Human Collaboration Tools



**3D Visualization
Web-based Viewers**



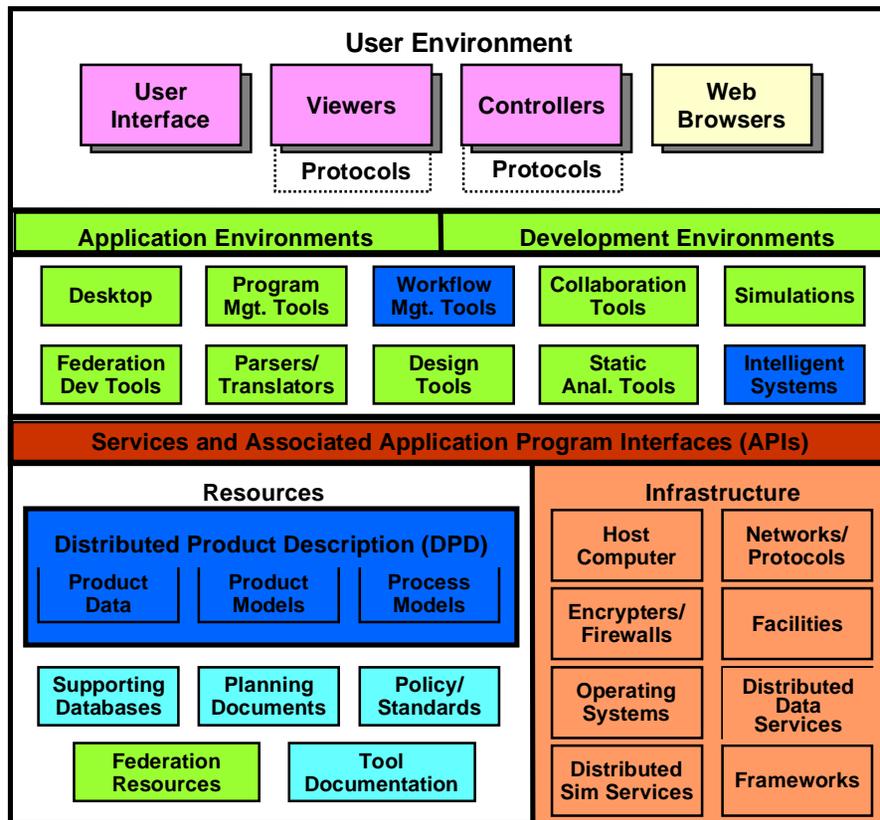
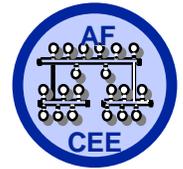
Affordability & Cost Tools



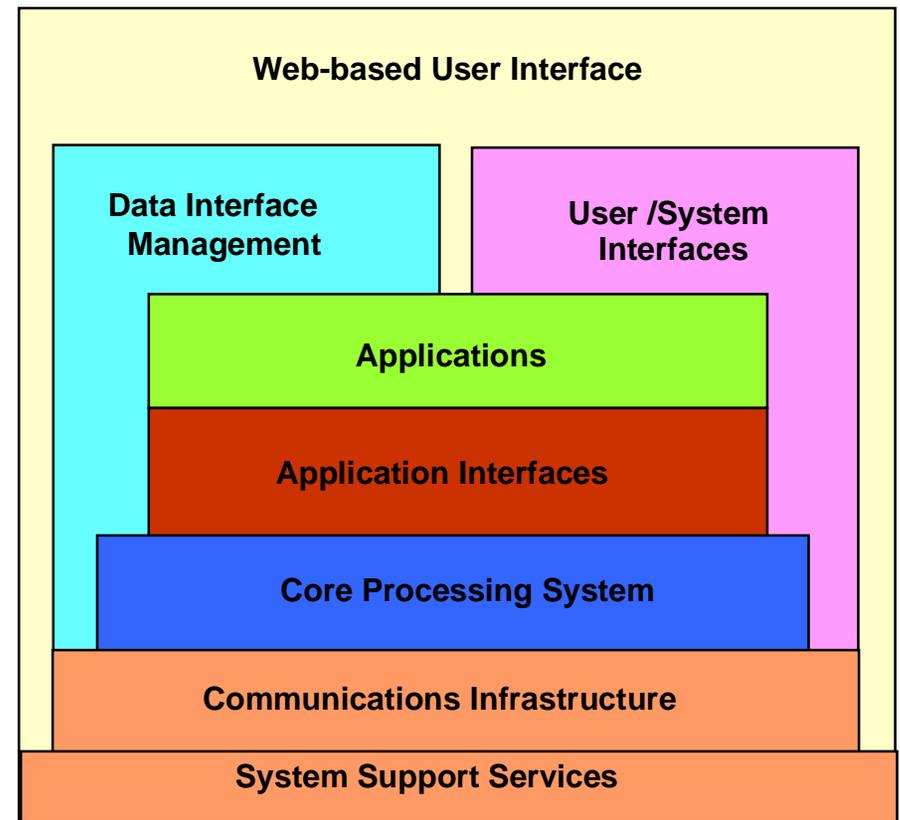
**Engineering & System Modeling
(JWARS, JSIMS, JMASS, Legacy, COTS, HLA)**



SBA Roadmap Reference System Architecture



SBA Reference System Architecture

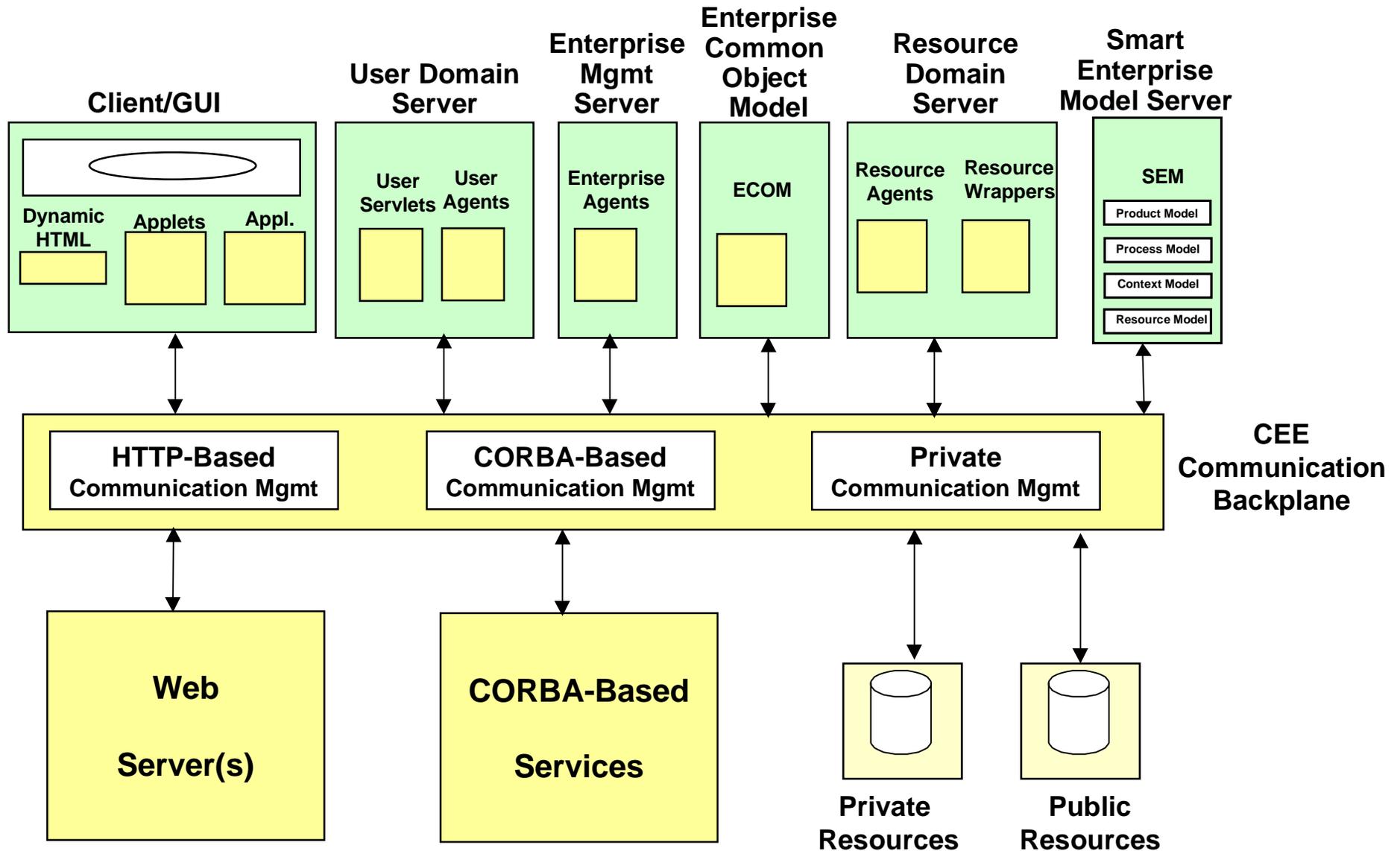
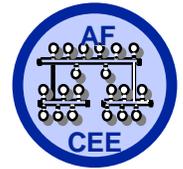


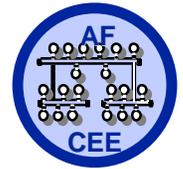
AFRL CE Reference Architecture

Color coded mapping to SBA Reference System Architecture



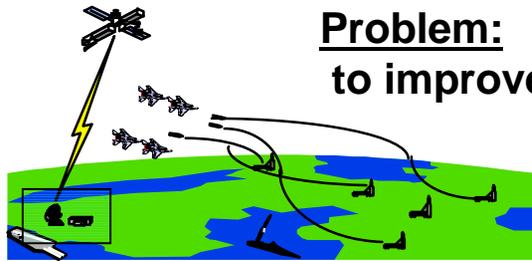
DUAP CEE Implementation - Oct 98





Sep 98 CE Experiment: Sensor-DecisionMaker-Shooter-Weapon

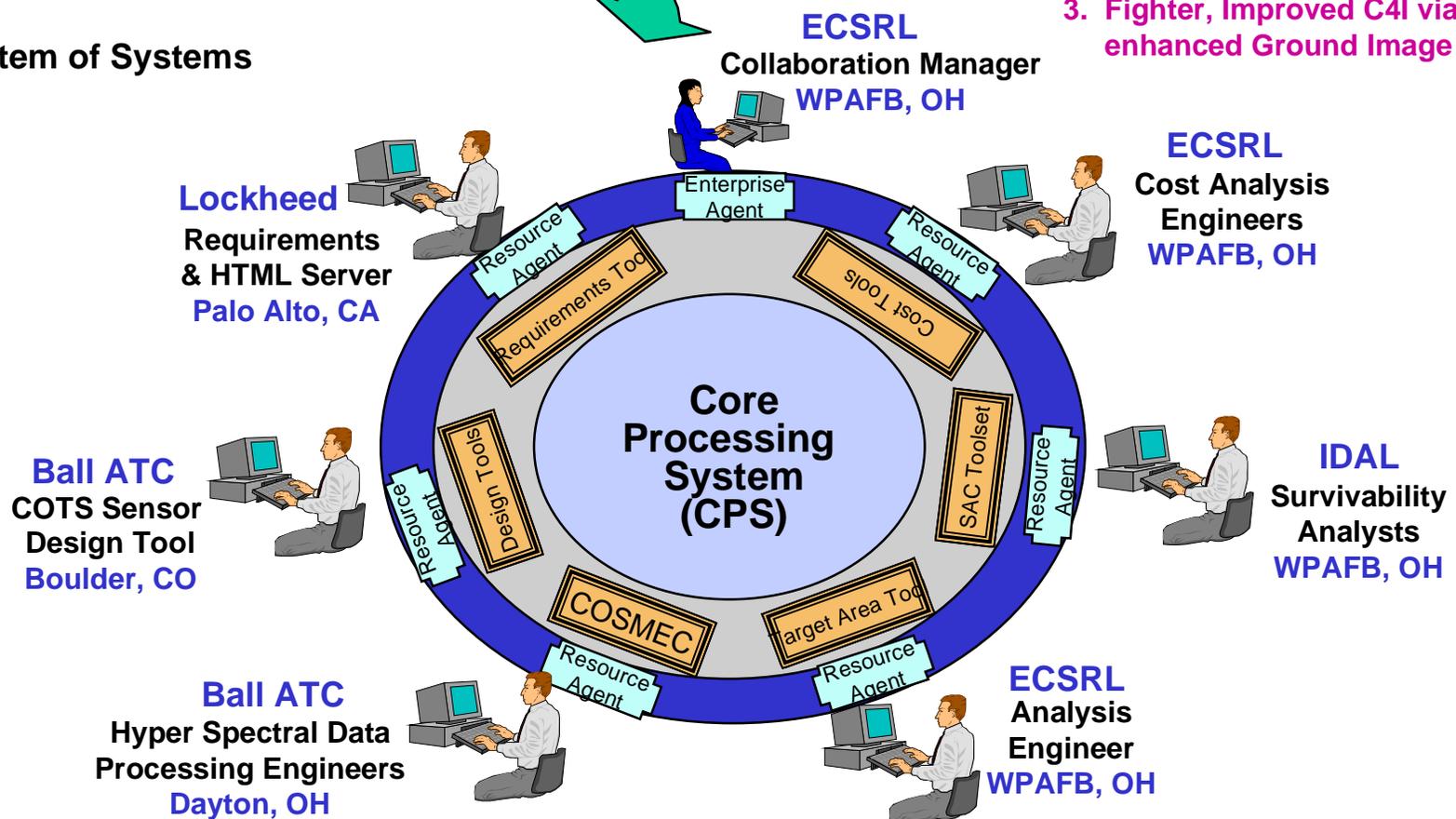
Problem: Examined a limited set of technology alternatives to improve the ability to locate and destroy mobile targets.



System of Systems

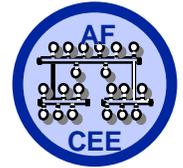
Collaborative Environment

1. Baseline Case: Fighter
2. Fighter, Off Board C4I Information
3. Fighter, Improved C4I via enhanced Ground Image S/W





Fall 99 Spiral Development Goals



- **Architecture Enhancements:**

- Workflow
- Variable Thickness GUI
- CORBA Services
- Product & Process Model Tools
- Multiple ORB Support (DCOM, Java...)
- Human Collaboration Tools

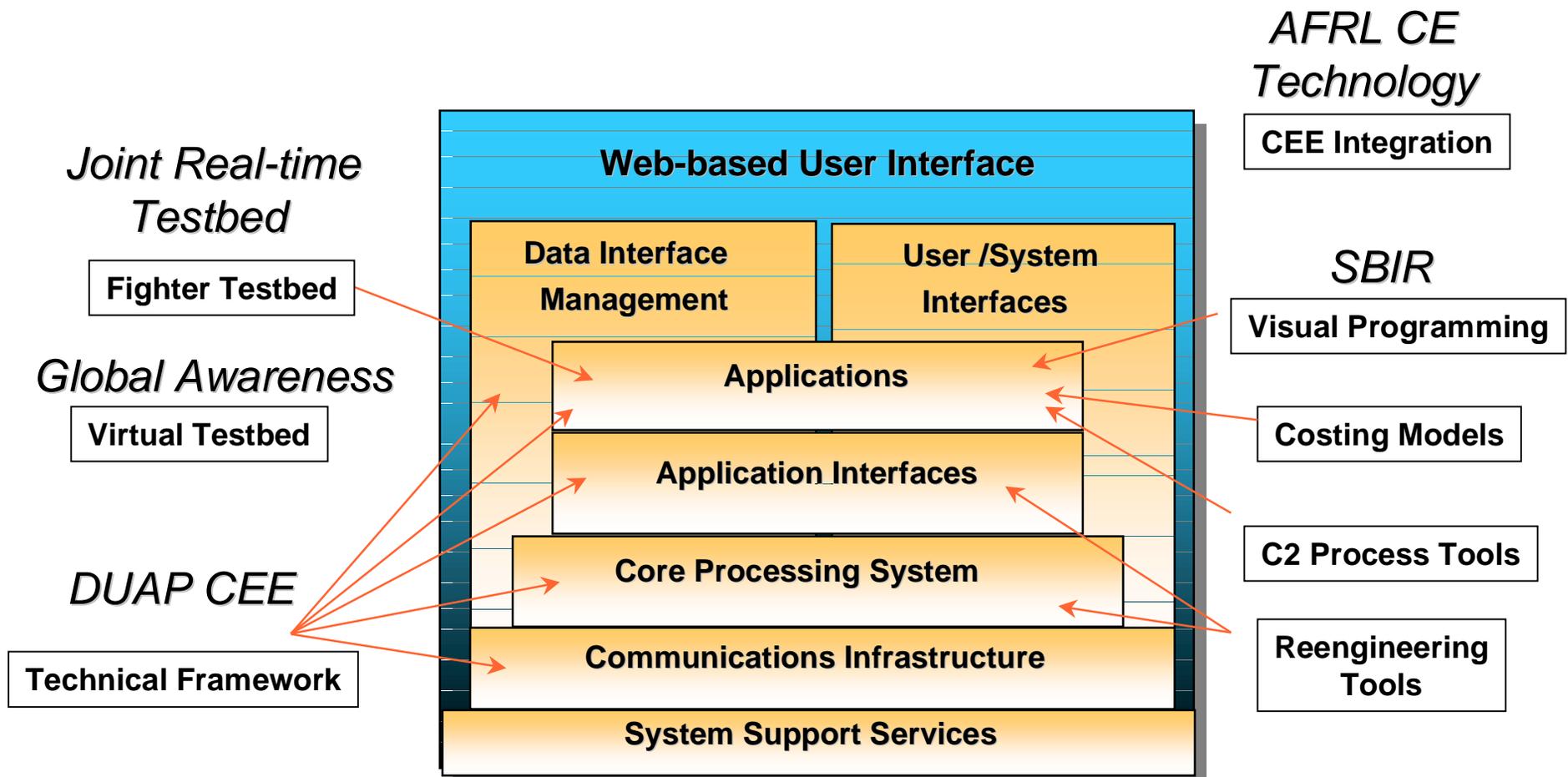
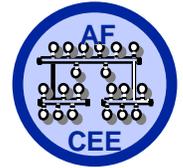
- **Experiment:**

- Expand Command & Control capabilities with constructive simulation
- Incorporate Space Based Radar Simulation
- Incorporate Producibility & Virtual Manufacturing Assets
- Demonstrate Enhanced Synchronous Collaboration Support
 - Real-time Mission Model
 - Man/Hardware-in-the-loop Simulators
- Demonstrate compliance with High Level Architecture (HLA)
- Access High Performance Computer (HPC) Resources
For Military Worth Analysis

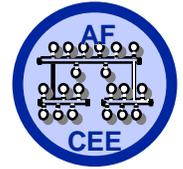


Collaborative Enterprise Environment

Current Technology Development Programs



Advancing CEE Architecture And Applications



21st Century Aerospace

A Vision for Distributed Collaborative Environments

