The C2 Platform
Vision, Challenges, & Strategy
Two Simple Ideas
One old, One new

- Old Idea:
  - Software intensive systems could be better and faster built if software came in reusable “components” analogous to those used in the integrated circuit industry.
    - Commercial software technology is making this possible
    - (OO, Java, CORBA, DCE, OLE, etc.)

- New Idea:
  - There are many possibilities for exploiting systems which are interconnected via sophisticated networks
    - The internet is providing both means and inspiration
Two Simple Ideas Made Real and Brought Together, Spawn Many More Ideas

- Microsoft
- JTA
- GCCS
- DII-AF
- GCSS
- Enterprise Engine
- OSF
- Open Systems
- OMG
- DODIIS
- Network PC
- “Connected Systems”
- TAFIM
- “Component Based SW”
- SW Reuse
- Fortezza
- CORBA
- OS-JTF
- “Extranets”
- Data Standardization
- CARDS
- SW Reuse
- CCPL
- Fortezza
- COTS
- Data Standardization
- Battle Labs
- ShDEC
- Info Architectures
- TAFIM
- HTML
- Internet
- Intellink
- MITRE
AF C2 System Vision
Platform Directorate View

Yesterday’s Efforts

Today’s Attempts

Tomorrow’s End-State

Independent “stovepipe” C4I Systems

Federated C4I Systems

Integrated C2 System

MITRE
Leveraging Commercial Products -
The Promise of “Open” & “Structured” Architected Systems

Some mission capabilities

Development resources are expended on small amount of software built to exploit capabilities of commercial products

Some system requirements can be served by common products developed for DoD

Substantial portion of system requirements are served by commercial products

Unsatisfied Requirements

Mission Application Software

Common Application Software

Framework and Services

Hardware

Time

MITRE
Changed SW and HW Development Environment at ESC

Average of Percentages for 22 Major ESC Systems

Hardware
- COTS: 67%
- "Unique": 22%
- "Common": 11%

Software
- COTS: 42%
- "Unique": 26%
- "Common": 32%
Information System Acquisition Policy & Practice Considerations

- Code Development vs Software Product Integration
- Demand for New Acquisition Policies and Practices
- Demand for Traditional (2167A, 5000, etc.) Development

Timeline:
- 1970
- 1980
- 1990
- 2000

Y-axis:
- 0.0
- 0.5
- 1.0
CUBE - AFBL Partnership

Developer-Integrator: Technical Innovation

User: Requirements, CONOPS
What is the Integrated C2 Platform?

- It is a set of “things”
  - Systems Infrastructure - “truly” Common Operating Environment
    - GCSS, GCCS, TBMCS core, IMDS, DCE, CORBA, OMG, DODIIS, JTA
  - Data Infrastructure - common semantic basis for C2 Interoperability
    - DDRS, SHADE, DIBCIS, Nat’l Spatial Data Infrast., Pedigree mgmt., etc.
  - Facilities - Defense Information Infrastructure (DII)
    - AFBL’s, OPFAC’s, CUBE, TIN, SIPRNET, MASC, Industry & other service connections
  - Suite of software versions:
    - operational, train & exercise, requirements exploration, test and evaluation, wargame model/simulation analysis
- It is a set of “activities”
  - Requirements connection from “field-to-laboratory-to-field”
    - Forward Falcon, Bosnia reachback to ESC/MITRE, etc.
  - Bandwidth and configuration management
    - Orchestrate delivery media for information, software update, configuration control, and system’s administration, etc.
  - Funding strategy
    - Existing Architecture initiatives, CORONA endorsement, etc.
  - Strategy for continuous evolution
    - “Managing Chaos”, recognizing popularity trends, etc.
  - Training, exercise, wargaming, analysis, & doctrine enhancement
Strategy

- **Project strategy:**
  - Establish Common Program Management Directives
  - Chief Architect
  - Architect Council = Chief Architect & Chief Engineers

- **Community strategy:**
  - Technical Architecture
    - COE development
    - Data management
    - Mission Applications interfaces
  - System Architecture
    - Interface compliance evaluation
    - Interoperability Labs
  - Operations Architecture
    - User defined CONOPS

CUBE/AFBL Spiral Evolution
R&D Investment
  - “Decision Relevant Information Management”
  - “Managing Chaos”

MITRE