The Engineering Society for Advancing Mobility in Land, Sea, Air and Space

The Standards Community:
'The New Way of Doing Business'

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SAE Aerospace
An SAE International Group

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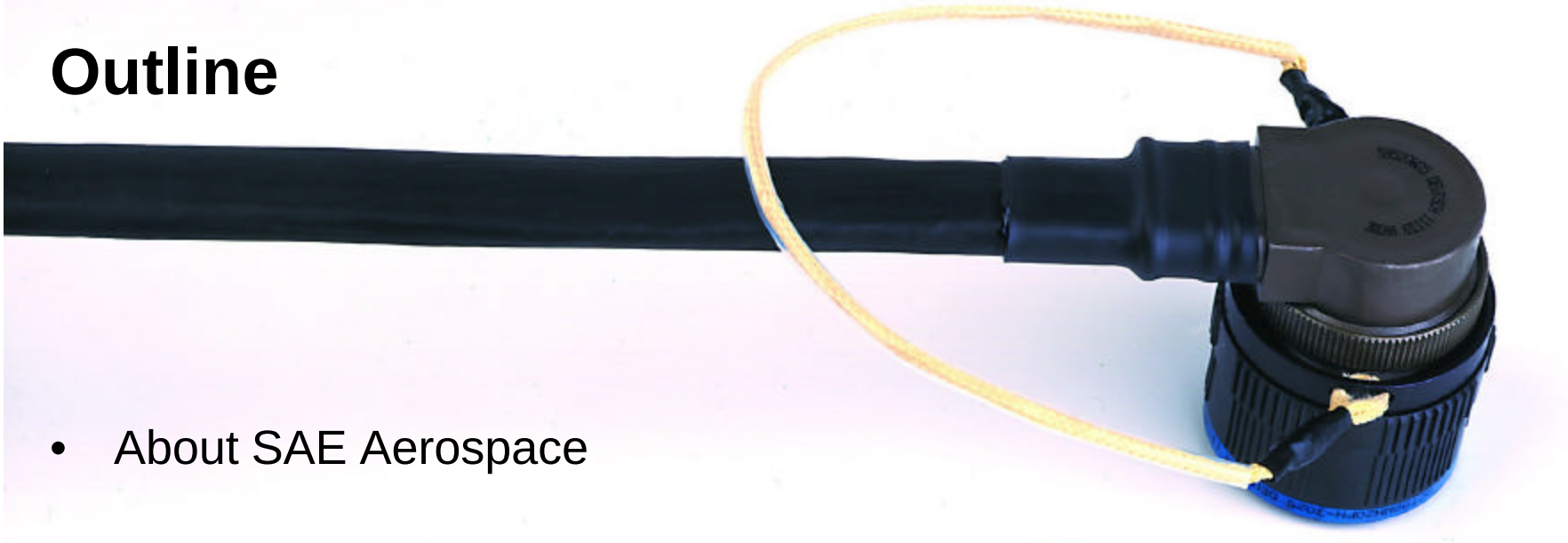
NDIA

Outline



- About SAE Aerospace
- Technical Community Relationships
- From interface standards to system integration standards
- Example – The Plug and Play Weapon

A Technical Society

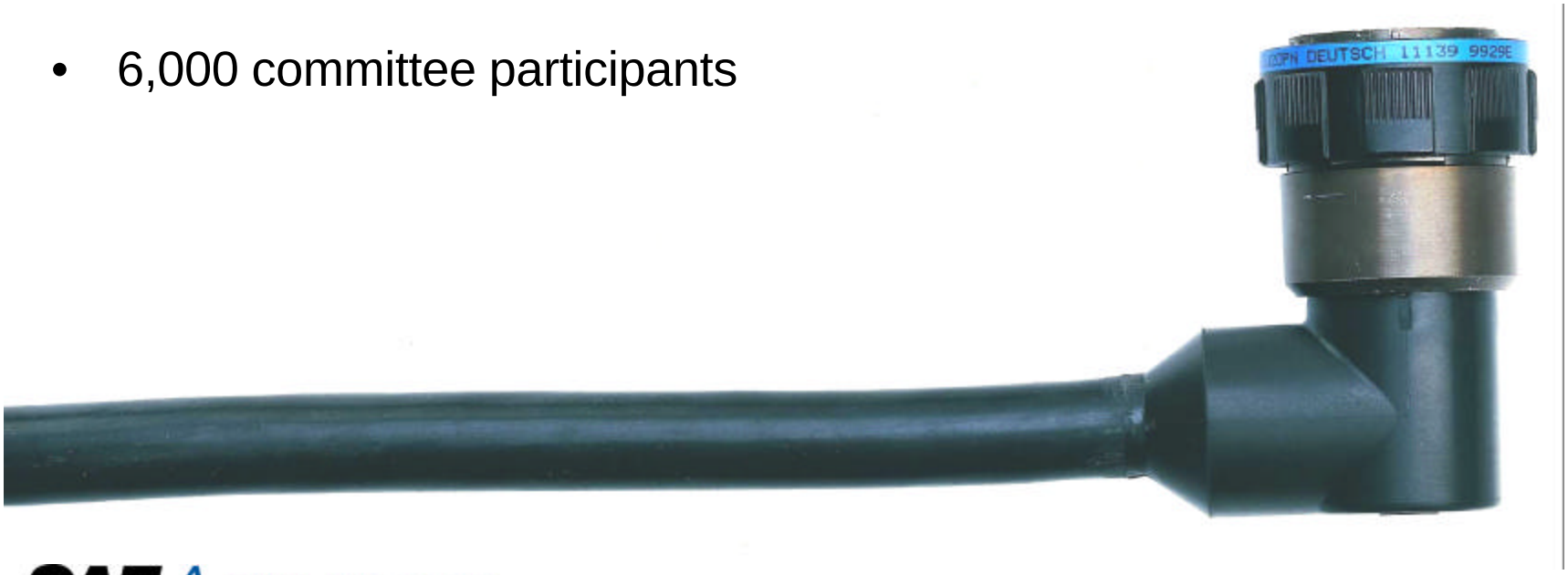
- Industry has two options for standards
  - partnership or team
  - work within a technical society

- Advantages of working within a technical society
  - free information exchange
    - industry
    - military
    - government civilians
  - no obligation for representatives

SAE Aerospace

World's largest provider of aerospace standards outside DoD

- 7,000 standards
- 7 divisions comprising 57 committees
- 6,000 committee participants



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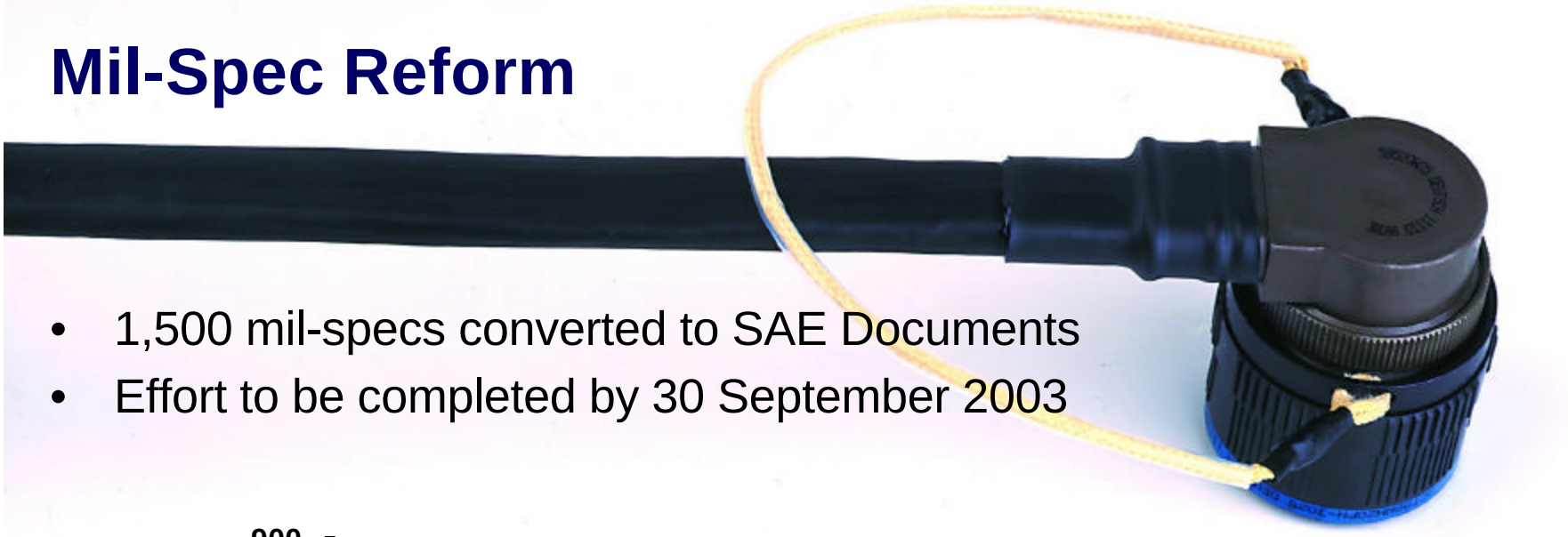
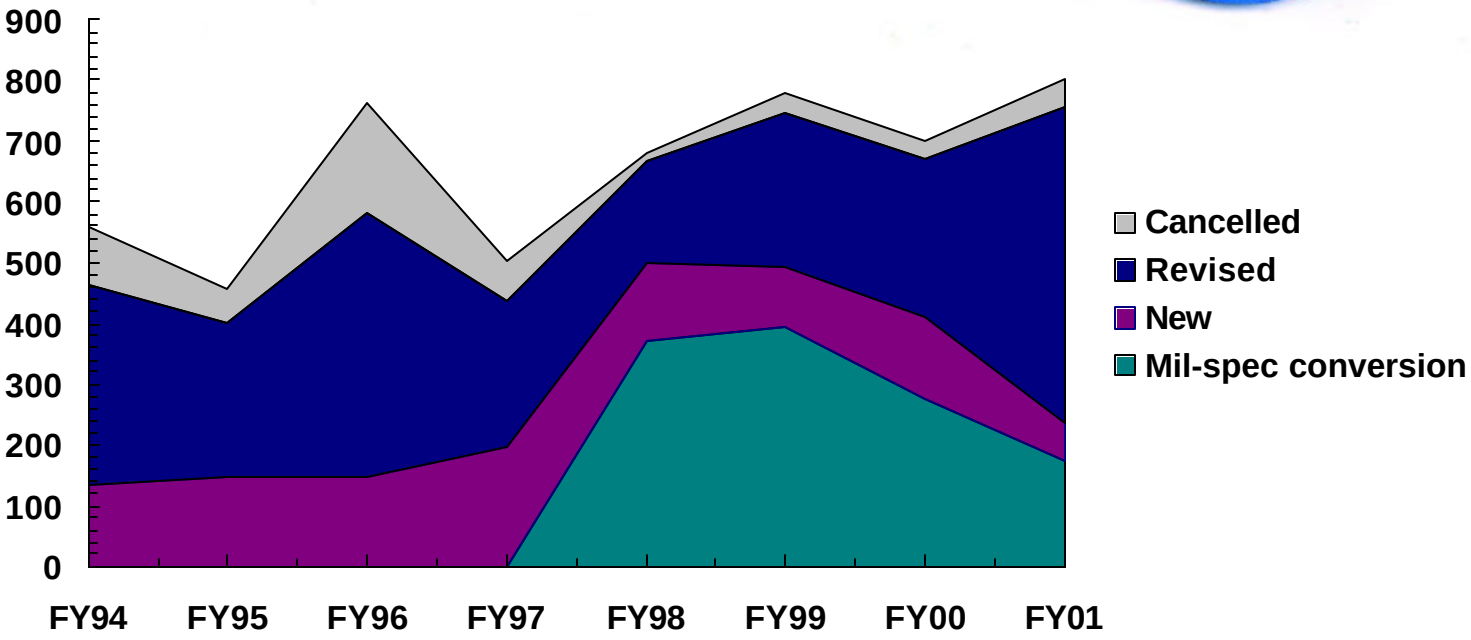
GENERAL DYNAMICS
Advanced Information Systems

Mil-Spec Reform



- 1,500 mil-specs converted to SAE Documents
- Effort to be completed by 30 September 2003



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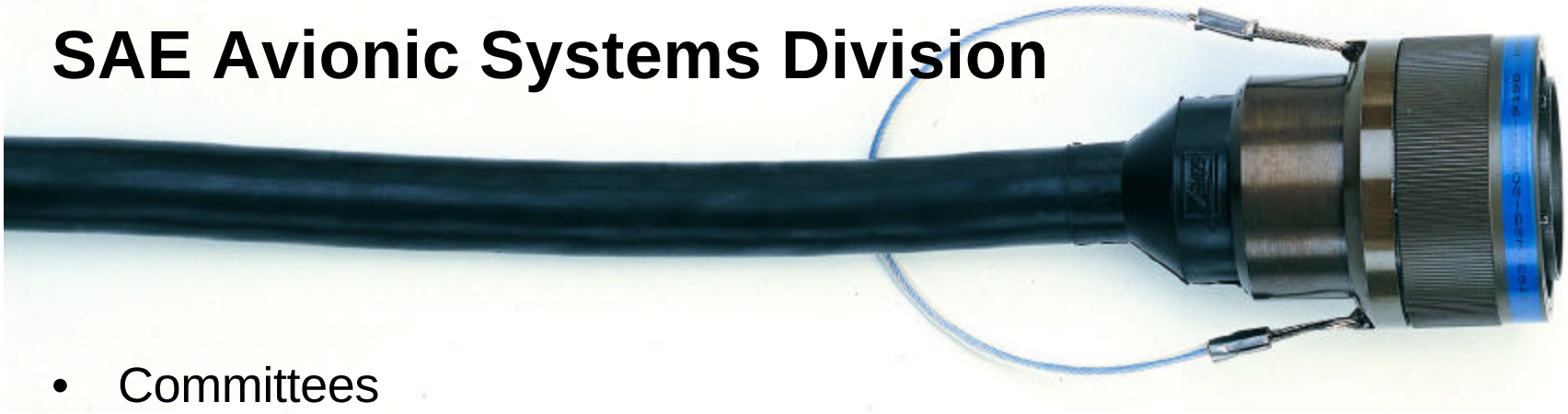
SAE Avionic Systems Division



- Committees
  - Aircraft Systems & System Integration (AS-1)
  - Embedded Computing Systems (AS-2)
  - Fiber Optics & Applied Photonics (AS-3)
- 10 subcommittees consisting of 17 task groups and user groups
- 34 active SAE Aerospace consensus documents
- Supports DoD (and NATO) in preparation of mil-specs

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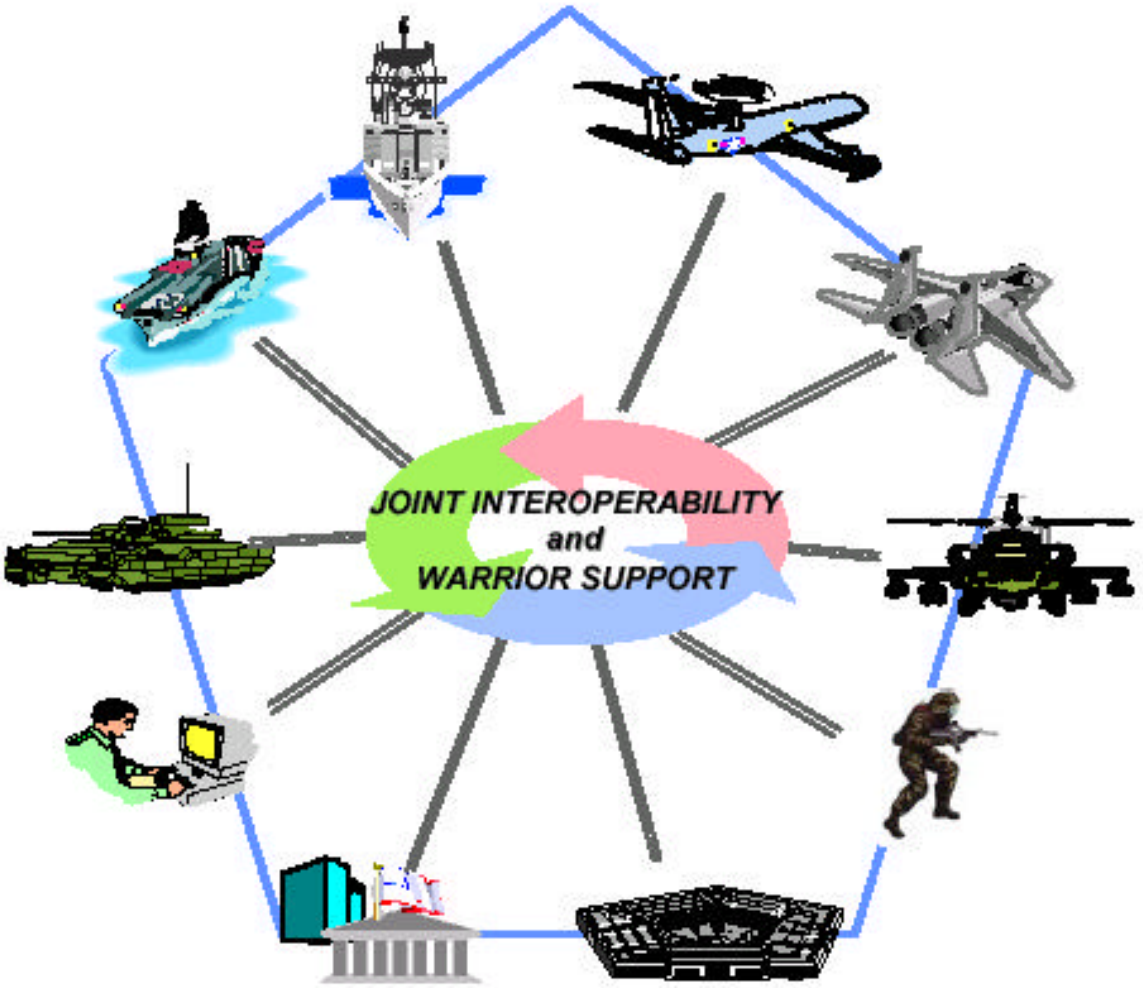
DoD Joint Technical Architecture (JTA) v. 4.0



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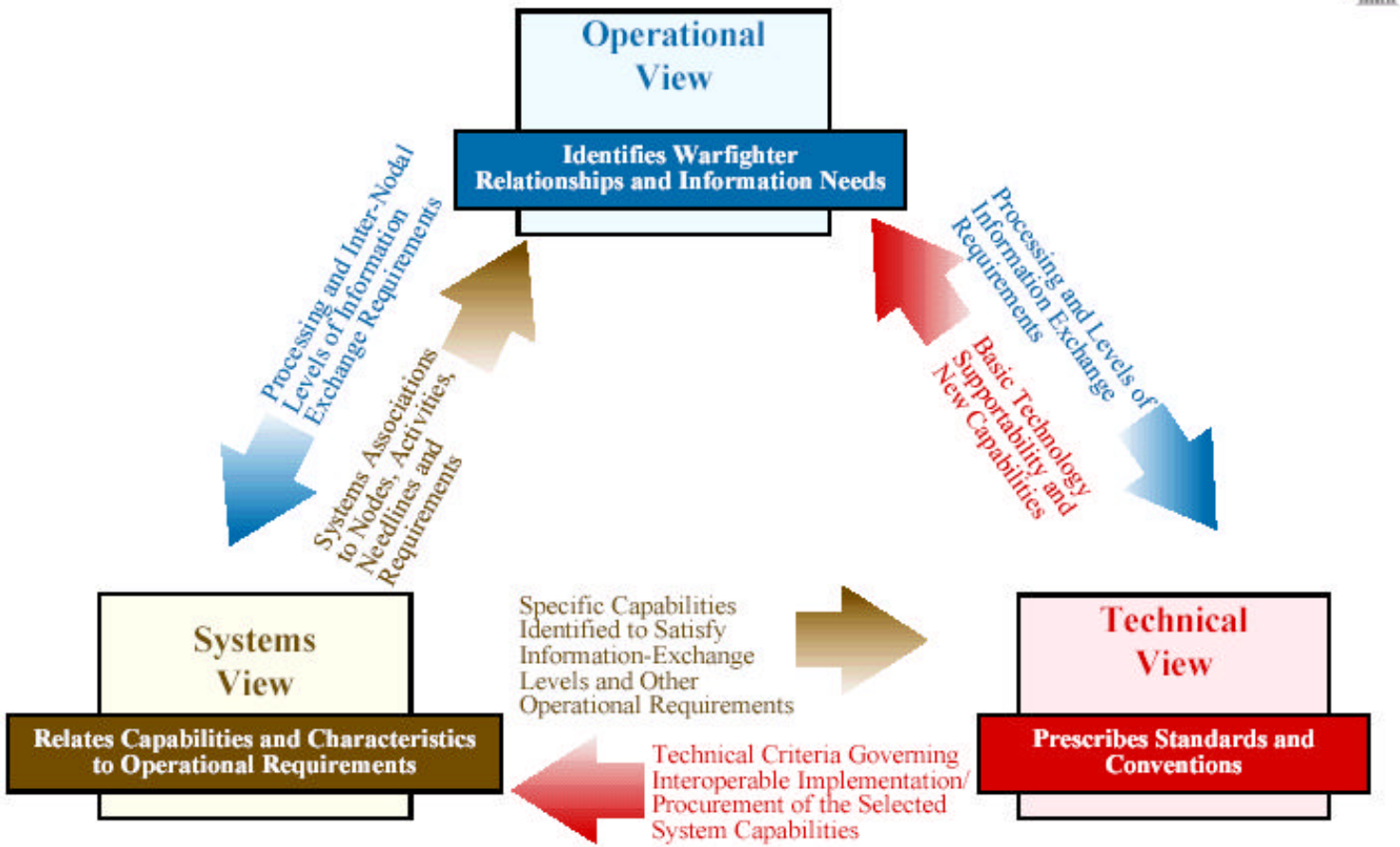
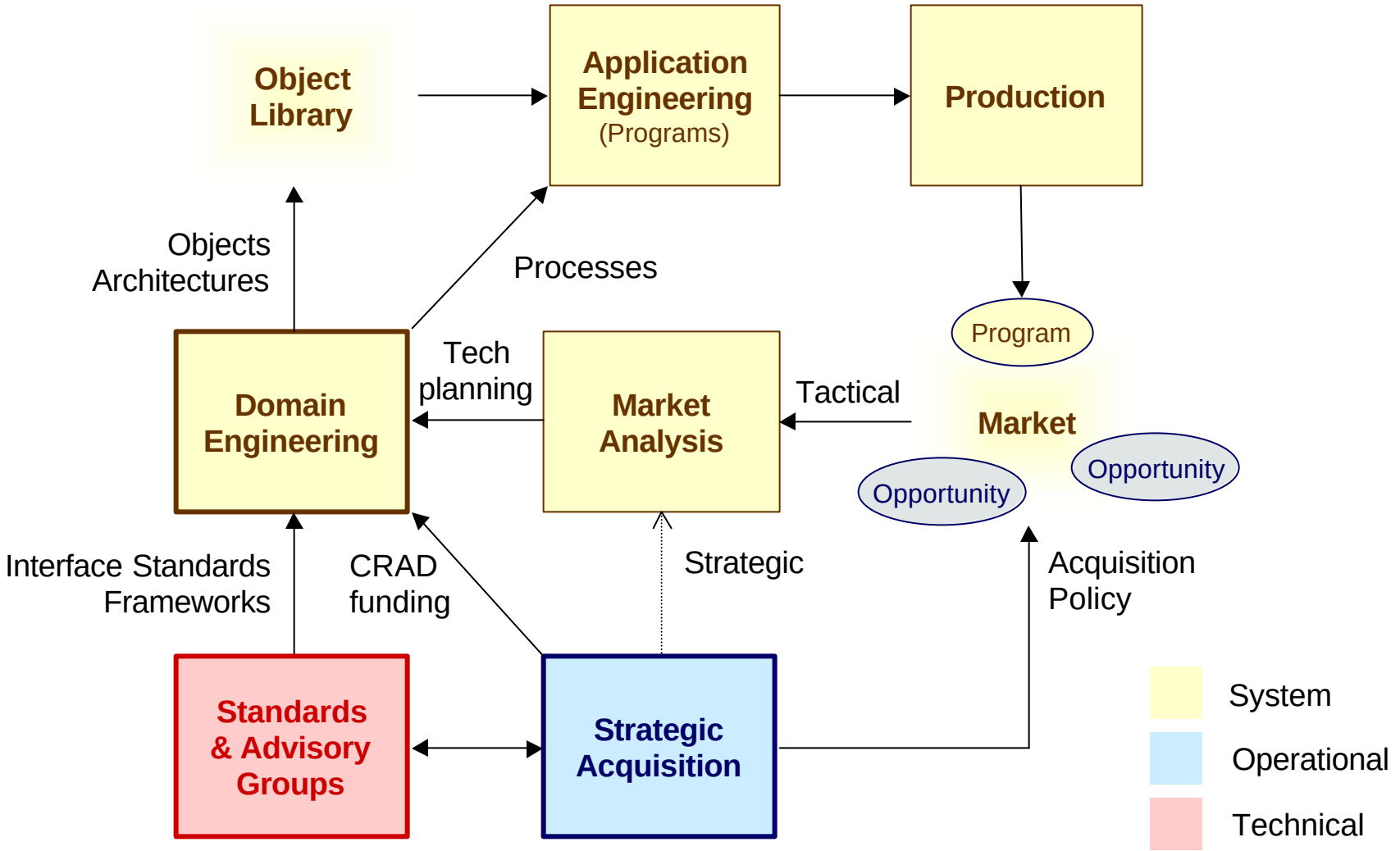
DoD Architecture Views Relationships



JTA Standards Preferences

- Interoperability (multiple vendor)
- Strong support in commercial market place
- Maturity (validated implementations)
- Publicly available / no IPR
- Consistent with law, regulation, policy and guidance documents
- Industry standards preferred to government standards
- International standards preferred to national standards

Industry Product Development Model

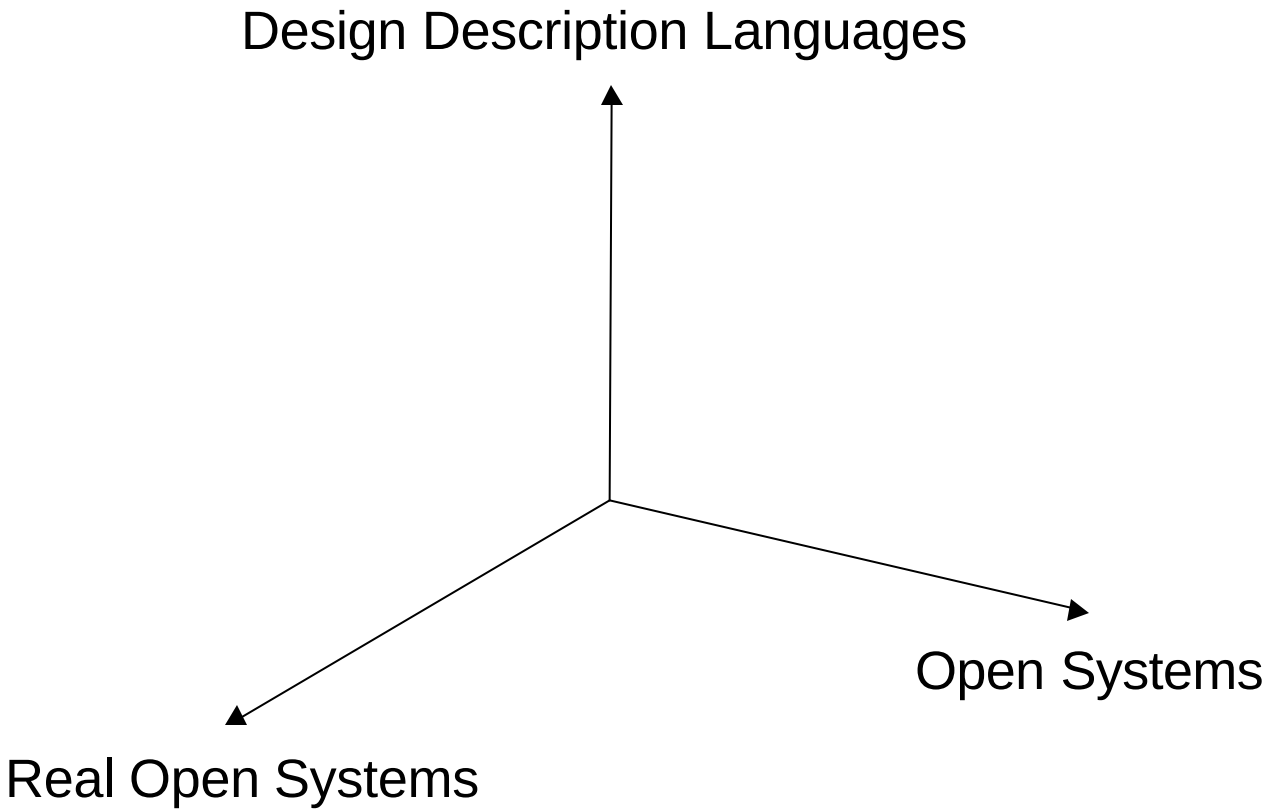


SAE ASD Standards Focus

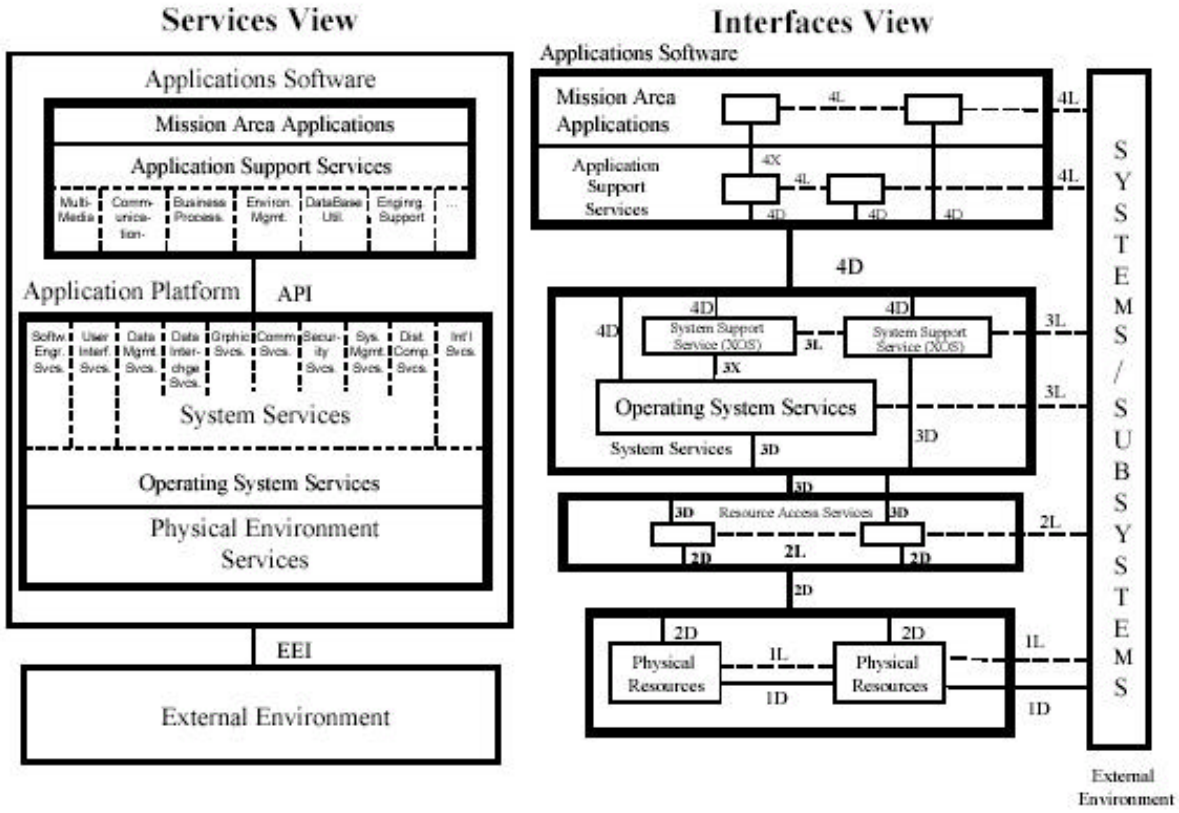
- Past
  - Emphasis on protocol standards (network oriented)
    - MIL-STD-1553, MIL-STD-1773
    - MIL-STD-1760
    - PI-bus, LTPB, HSRB

- Present
  - Restrict protocol standards to specialist niches (e.g. weapons)
  - New emphasis on system integration standards/guidelines
  - Plug and Play standards

ASD Standards Space



DoD Technical Reference Model



Real Open System Model
SAE Generic Open Architecture (GOA) Framework (AS4893)

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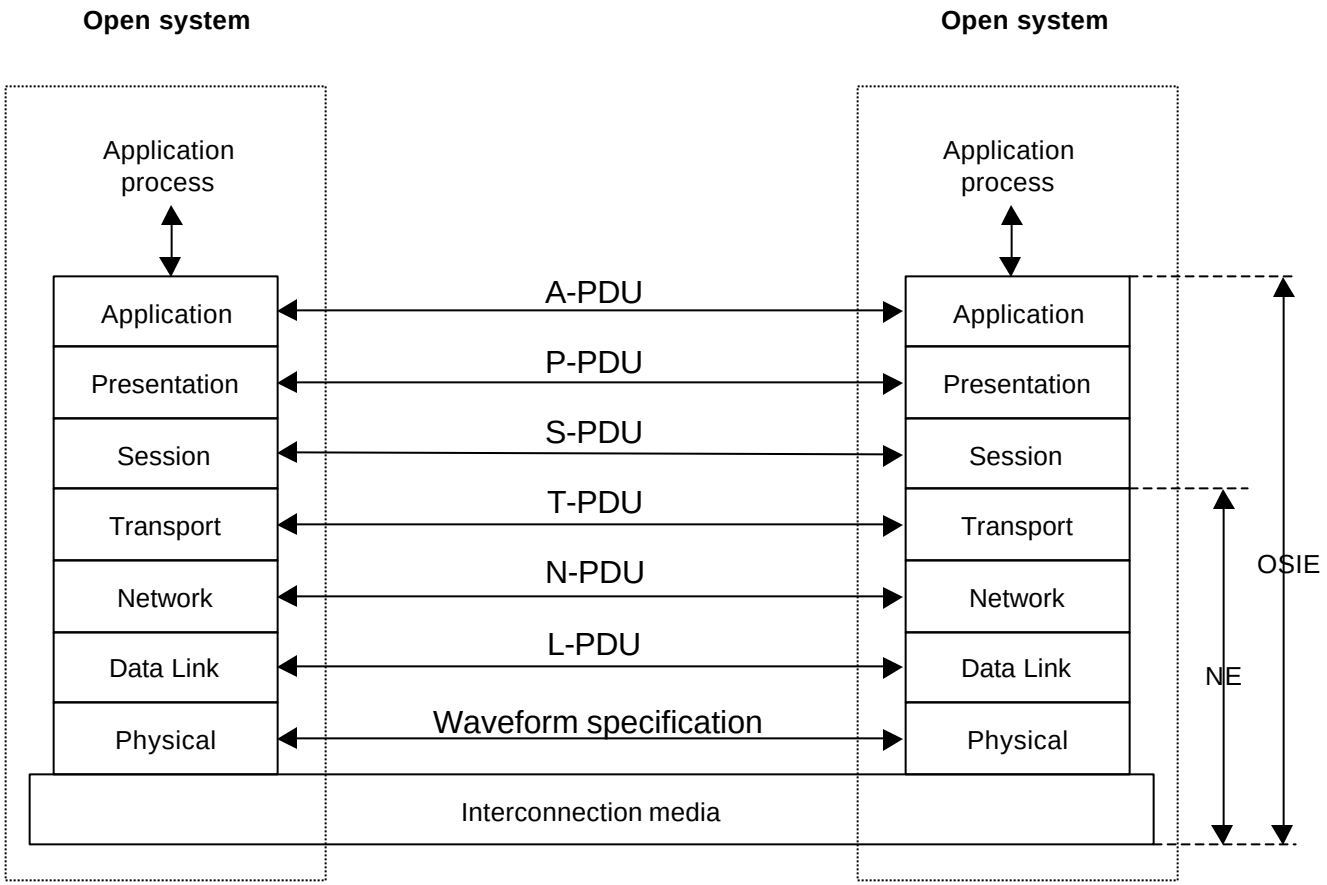
Basic Reference Model for OSI

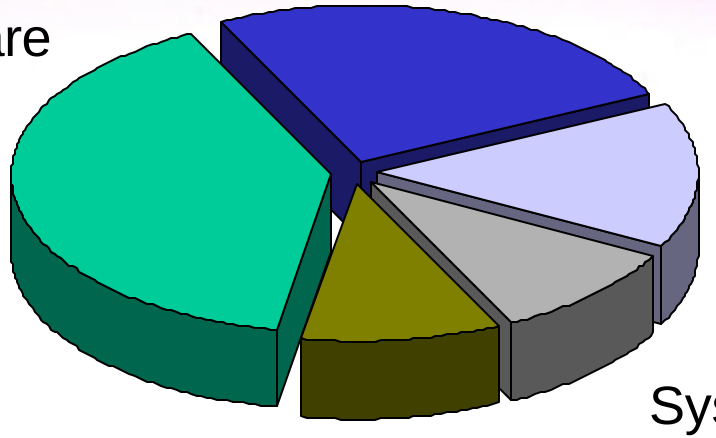


Model of Open System
SAE Generic Aircraft-Store Interface Framework (GASIF) (AS5532 draft)

SAE AADL (AS5506 draft)

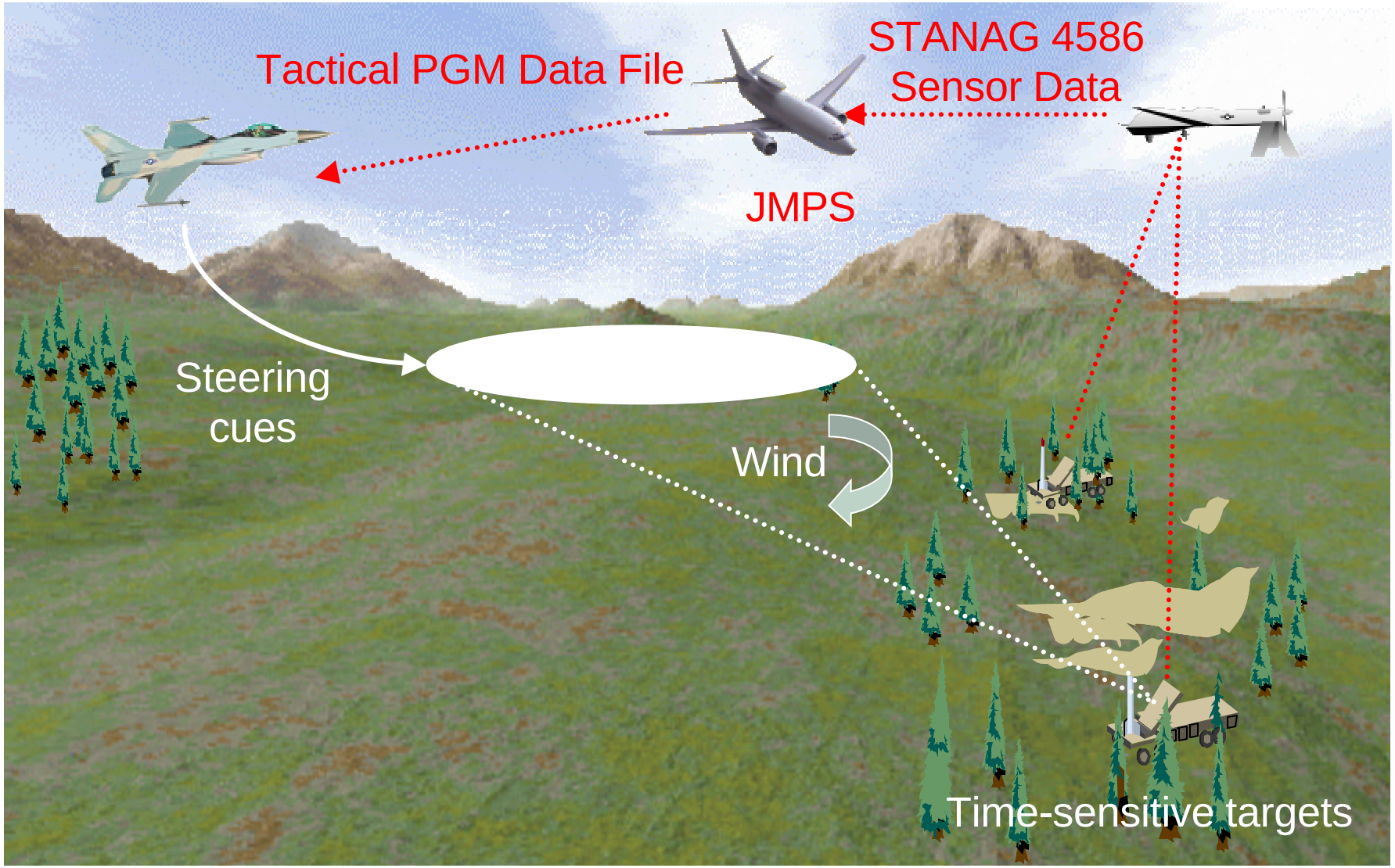
- Avionics Architecture Description Language (AADL) used to describe properties and interfaces of software & hardware components.
- Applicable to hard real-time, resource-constrained, safety-critical computer systems with specialized I/O hardware.
- Based on Honeywell ADL (MetaH).
  - Developed under DARPA & Army AMCOM sponsorship
- Anticipates UML-RT.
  - UML profile for schedulability, performance & time
- Large industrial support.

Example – The Plug and Play Weapon

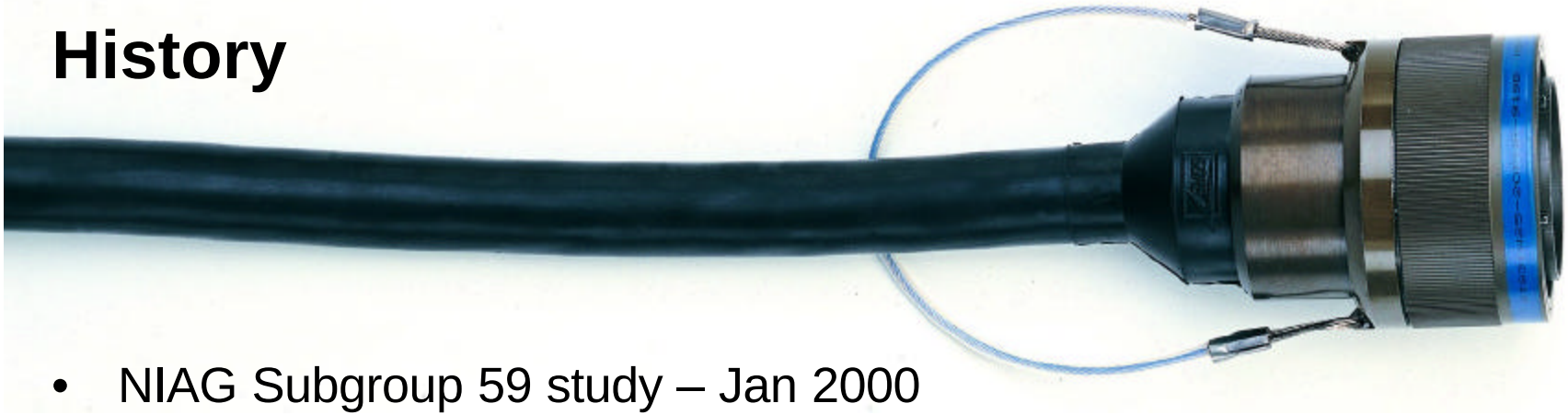


Typical NRE analysis of weapon integration
MIL-STD-1760

Sensor-to-Weapon Integration



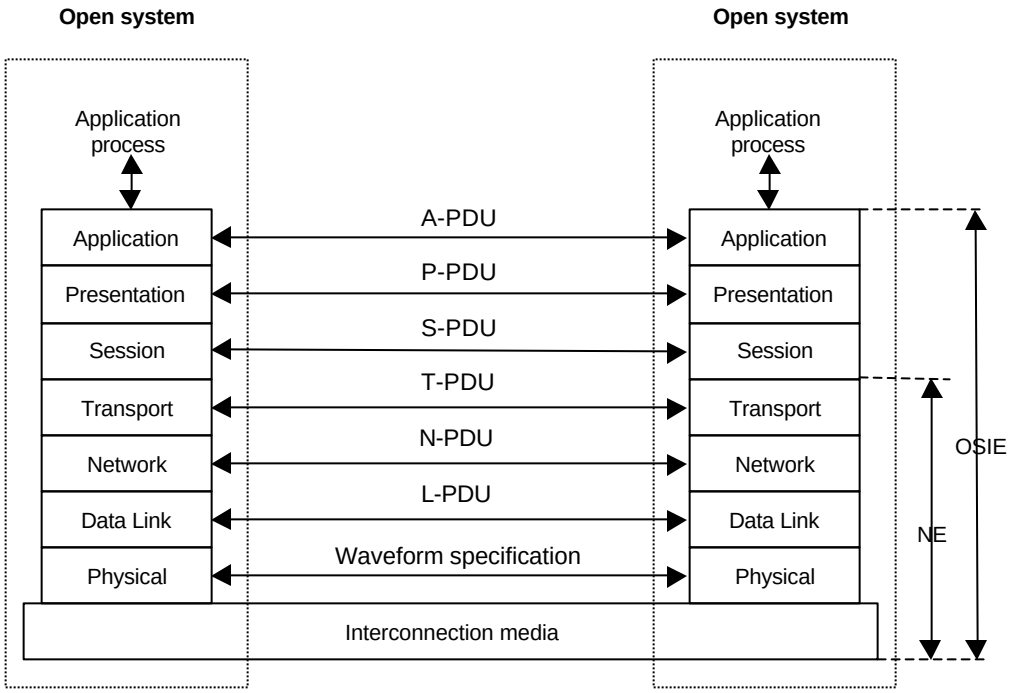
History



- NIAG Subgroup 59 study – Jan 2000
- SAE statement of intent – April 2001
- Program of SAE standards to achieve plug and play (due 2003)
- Joint follow-on study – SAE AS-1 and NIAG Subgroup 72 (due 2004)
- Sponsorship by DoD

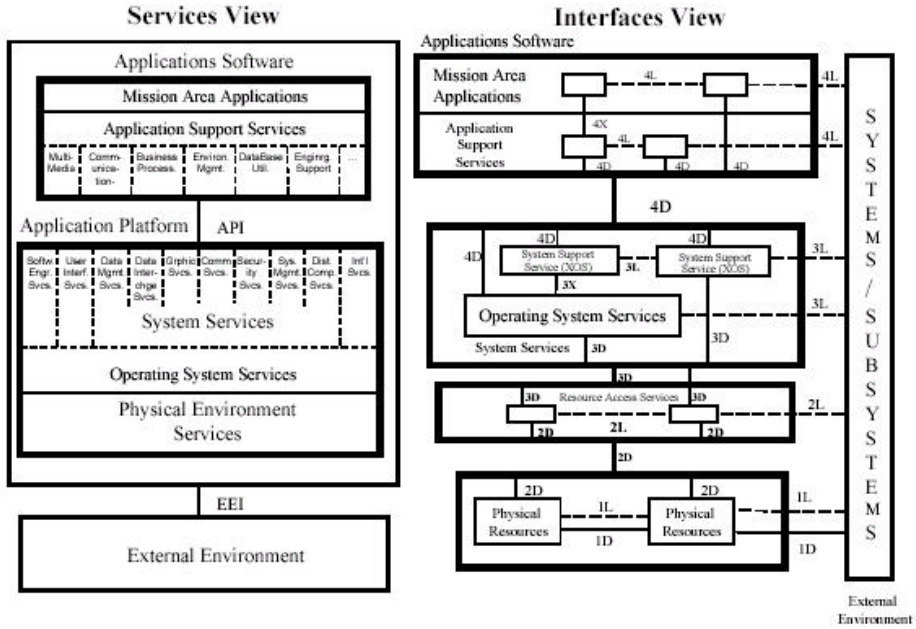
Open Systems

- MIL-STD-1760 protocols
- Miniature munitions interface
  - MIL-STD
  - SAE network protocol standard
- Common ICD Format
  - SAE Aerospace Standard
- Tactical PGM Data File (TPDF) Format
  - MIL-STD
- Generic Aircraft-Store Interface Framework (GASIF)
  - SAE Aerospace Information Report



Real Open Systems

- GOA preferred standards
  - SAE Aerospace Standard
- Common LAR Algorithm
  - SAE Aerospace Standard



- DoD request to define Plug and Play APIs
- Joint NIAG/SAE study to define Plug and Play for NATO
- AADL allows description of Plug and Play components

The New Way of Doing Business

- Shift in focus to system integration standards employing underlying commercial standards where desirable
- Application-oriented standards
- Coordinated approach to standards is critical
  - Reference models/frameworks
  - Engagement of all parties at interest
  - Clear roadmaps