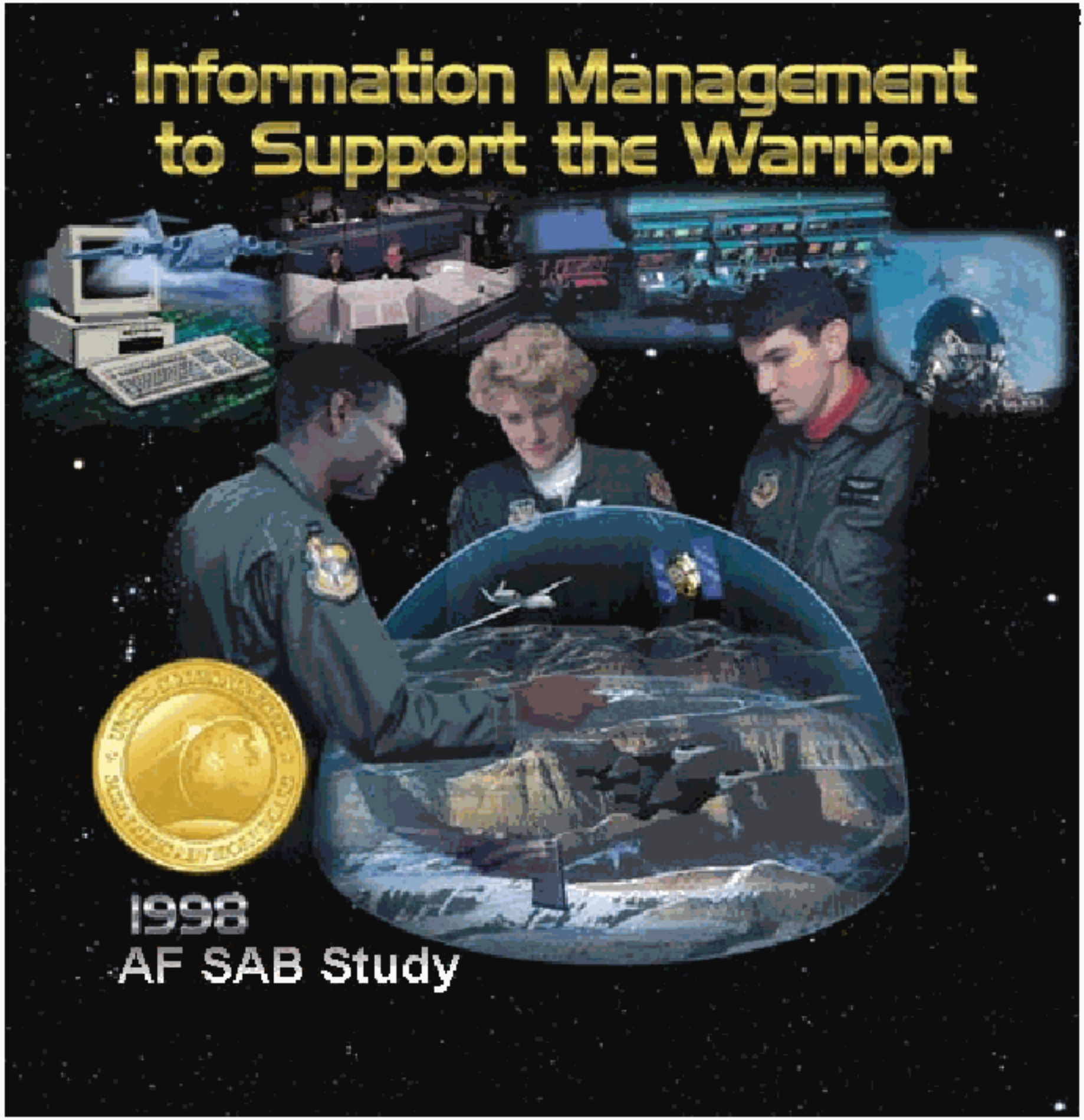
Information Management to Support the Warrior



1998
AF SAB Study

Overview

- Our Team
- The Requirement and The Solution
- Battlespace InfoSphere Combat Information System
- Information Technologies Supporting the Battlespace InfoSphere
- Battlespace InfoSphere Acquisition Strategy
- Value of the Battlespace InfoSphere to the Air Force
- Actionable Recommendations

Our Team

Chair: General (Ret) Jim McCarthy

General Officer Participant: Maj Gen John Hawley

Executive Officer: Maj Doug Amon
Technical Writer: Maj Mark Huson

Requirements
- Maj Gen (Ret) Tom Swalm
- Prof Randy Katz
- Mr George Spix
- Mr Bernie Hoenle

Architecture
- Dr Chuck Morefield
- Dr Bob Sproull
- Dr Barry Leiner
- Maj Gen (Ret) Rich O'Lear
- Prof Jim Hendler

Technology
- Dr Valerie Gawron
- Prof Ed Feigenbaum
- Dr Bill Rouse
- Dr Randy Davis
- Mr Skip Saunders
- Mr Scott Fouse
- Mr Ed Mahen

The Requirement & The Challenge

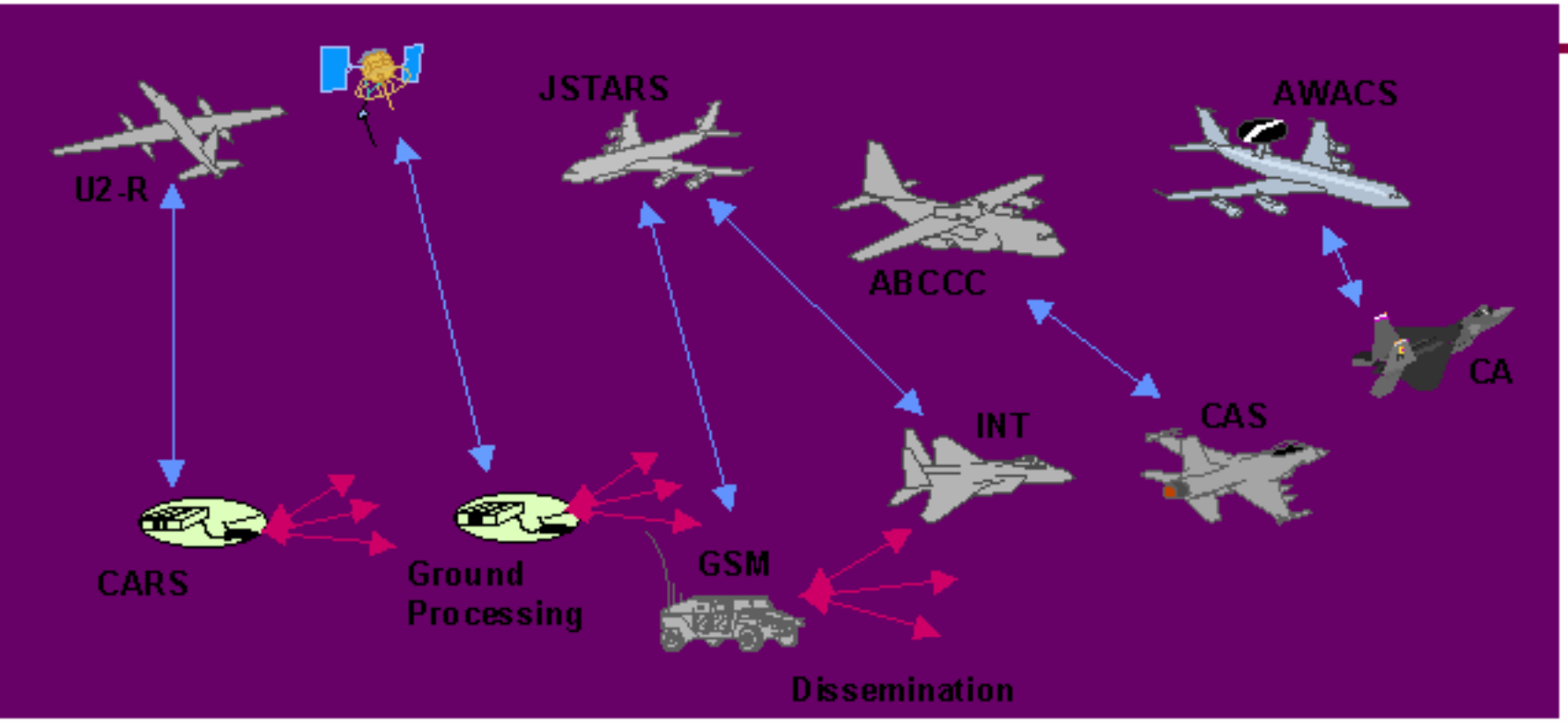
The *right* information at the *right* time disseminated and displayed in the *right* way so…

Without creating an "Information Blizzard"

Commanders (and "Crew chiefs") can do the *right* things at the *right* time in the *right* way

And do it all faster than the other guy: Information Superiority

Today's Combat Information Reality



- Little interoperability
  - Joint service
  - Coalition
- Large forward footprint

- Labor intensive collection and coordination
- Individual stovepipe systems
- Difficult to integrate
- Difficult to build recognized operational picture
- Inflexible
- Time intensive
- Disjointed workflow

- Scattered snapshots of the battlespace
  - different time
  - different views/aspect angles
  - different parameter names
- Fraction of the information sources used
  - intelligence
  - open sources

Data overload and information starvation

Future Combat Operations Require a "Battlespace InfoSphere"

Our Shared Vision - Information Superiority

- Joint Vision 2010 - our ability to achieve full spectrum dominance requires information superiority
- Global Engagement - Global awareness & command and control, the keystone to Air and Space Power is achieved through information superiority

> "While information superiority is not the Air Force's sole domain, it is, and will remain, an Air Force core competency."

- Providing Full Spectrum Dominance requires a truly interactive common battlespace picture:

> •Integrated global and theater air, space, (subsurface) and surface picture of the battlespace for the 21st century Joint Force Commander
> •Real time control and execution of all air and space missions
> •Interoperable for seamless integrated battlespace management

…… And more…. **The Battlespace InfoSphere**

The Solution

- Continue evolution to Network Centric Warfare
  - Leverage and Explore current programs and investments
  - Leverage new Joint Operational Concepts
- Overlay new Battlespace InfoSphere (BI) concept for managing information
  - Build on AF SAB and DSB recommendations
  - New mission conops to be “Use-driven”
- Apply evolving acquisition concepts
  - Disciplined development and integration into force
  - Rapid spiral development, responsive to users’ needs

Our Study Assumptions

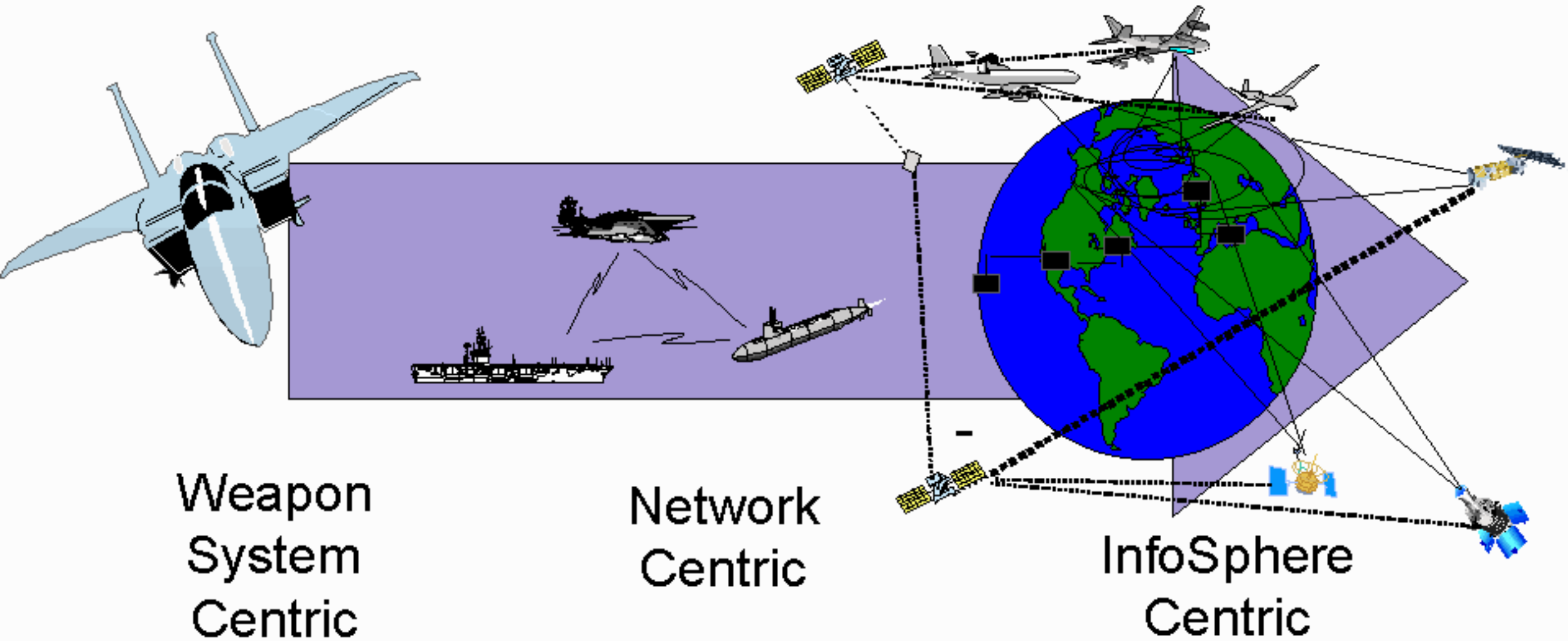
- Joint and/or coalition missions must be supported
- Move from information "pull" to "use-driven" concepts
- Sufficient bandwidth, connectivity, computation, storage, assurance and protection - outside this scope
- Future combat information systems must incorporate non-combat information

Focus on Combat Information Management

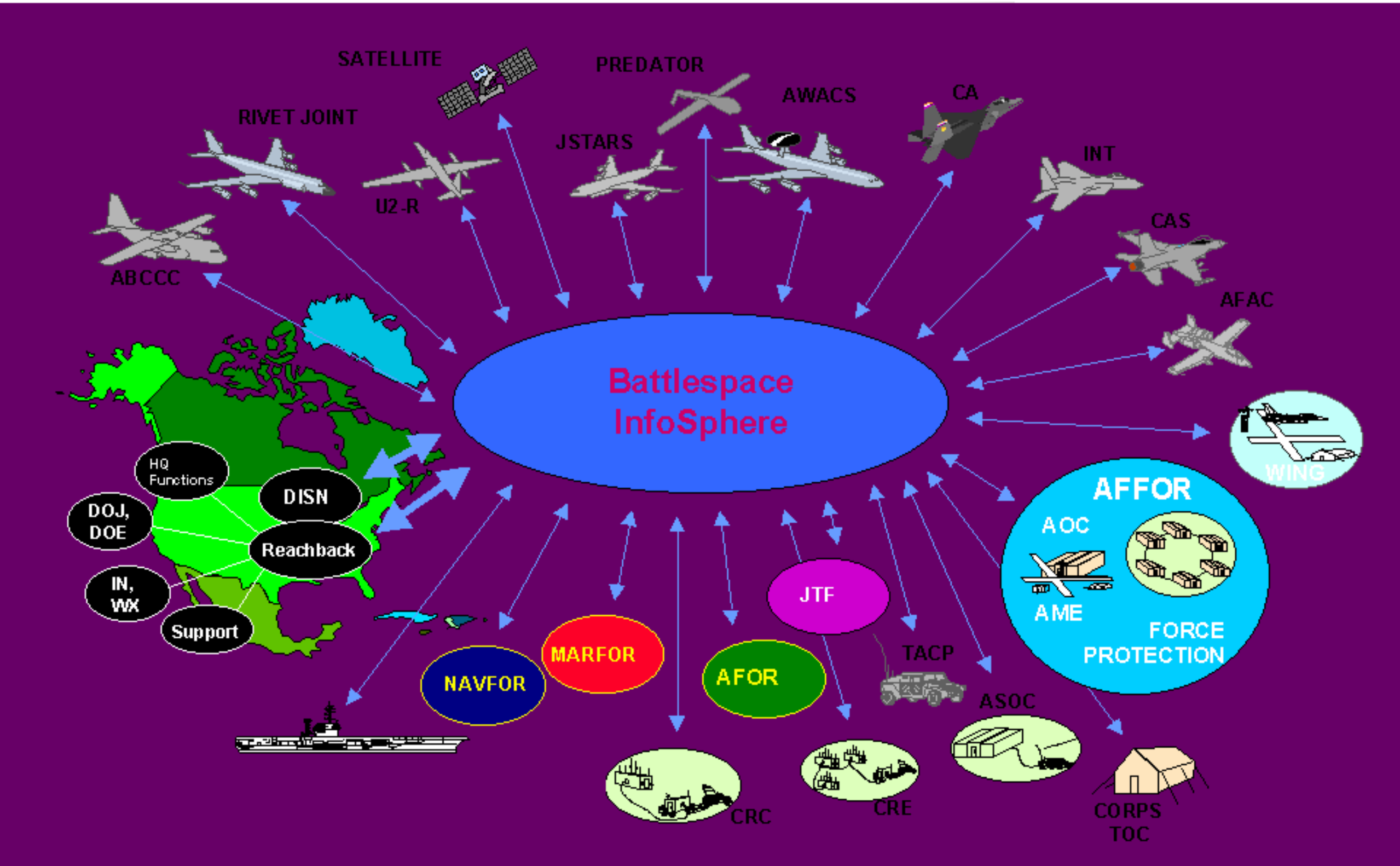
Managing Combat Information

- Combat information requires management
- Staff function to operate and manage the system
- Human control with rule based information decisions
- Organizes data by referencing and cataloging
- Assembles data into useful information
- Publishes data for common sharing
- User needs met by subscription or search
- Creates Common Operating Picture
- Provides constant updating of selected information
- Achieves Information validity through control of inputs
- Information presented at the user's desired level of knowledge
- Common understanding achieved by current shared information at highest level of cognition

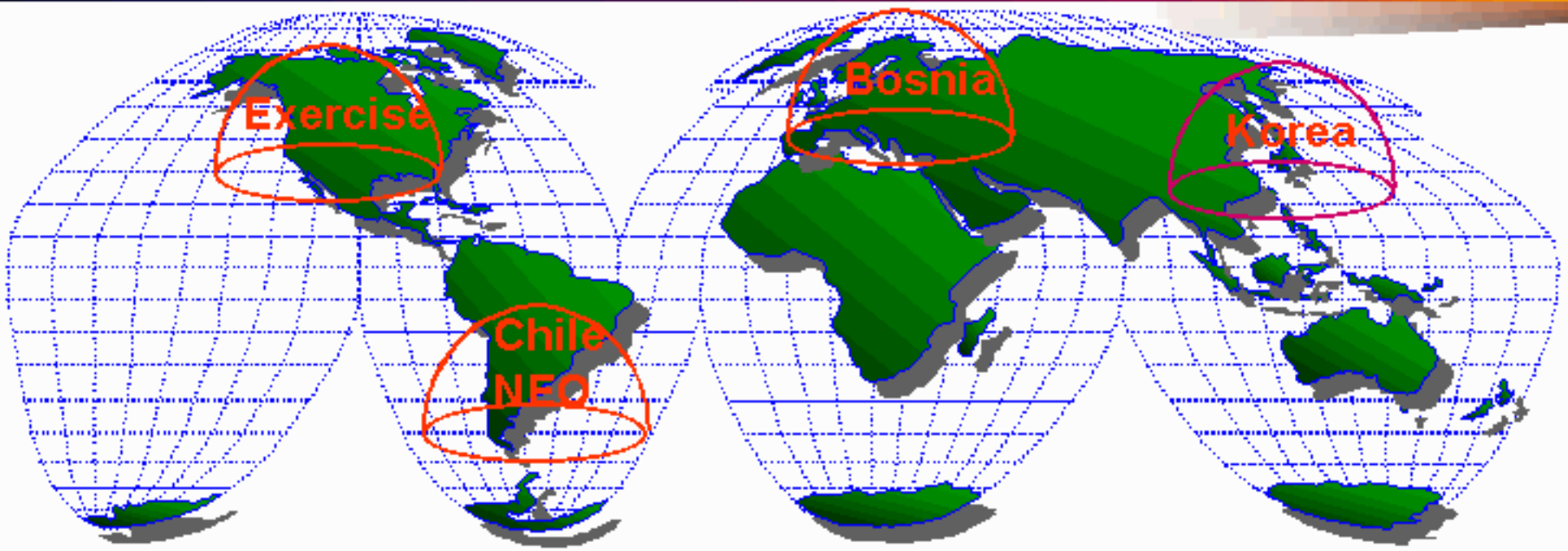
Our Vision of Information has Been Evolving



The Battlespace InfoSphere of Tomorrow

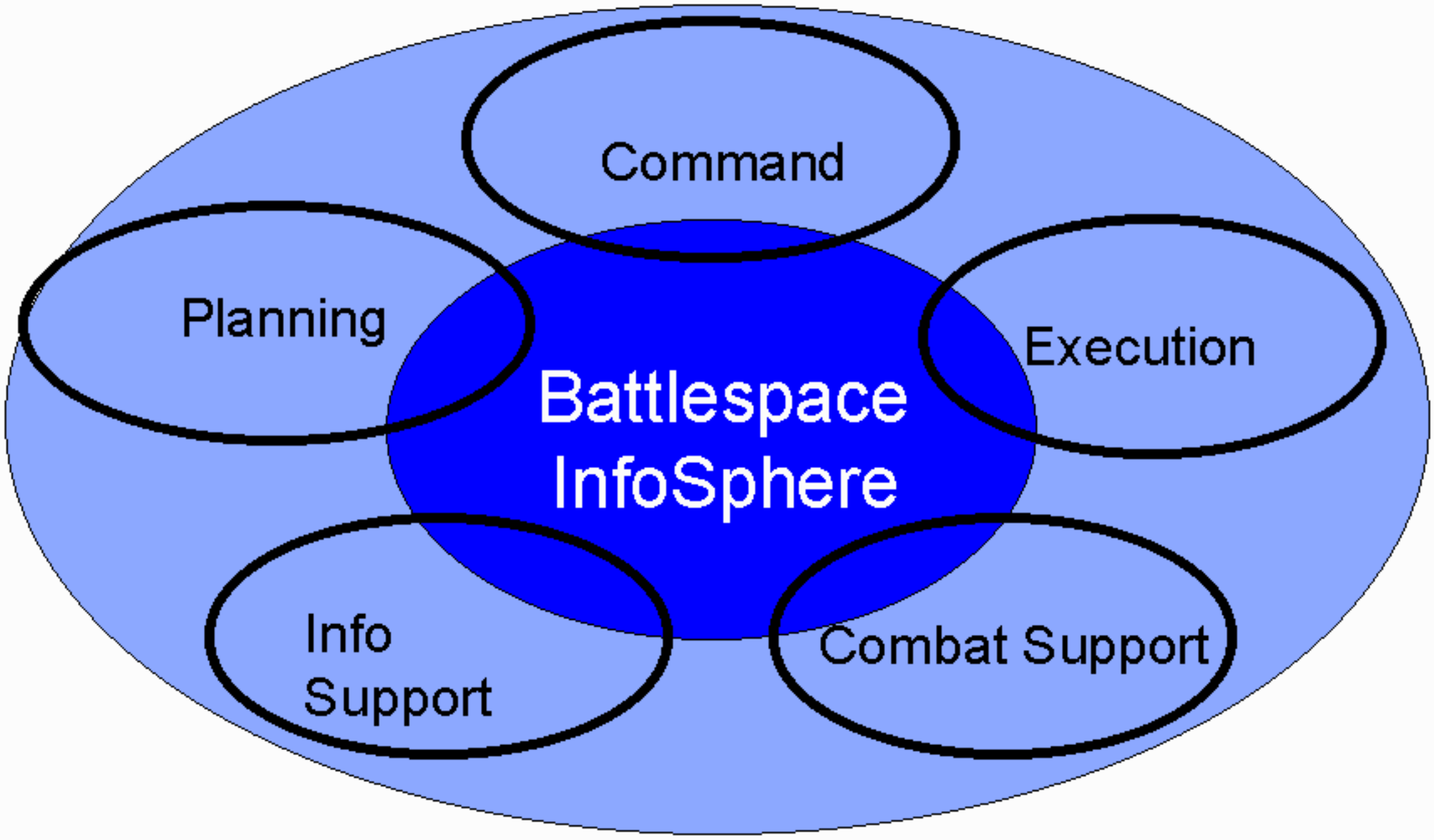


CINC/JTF Control of Battlespace InfoSphere

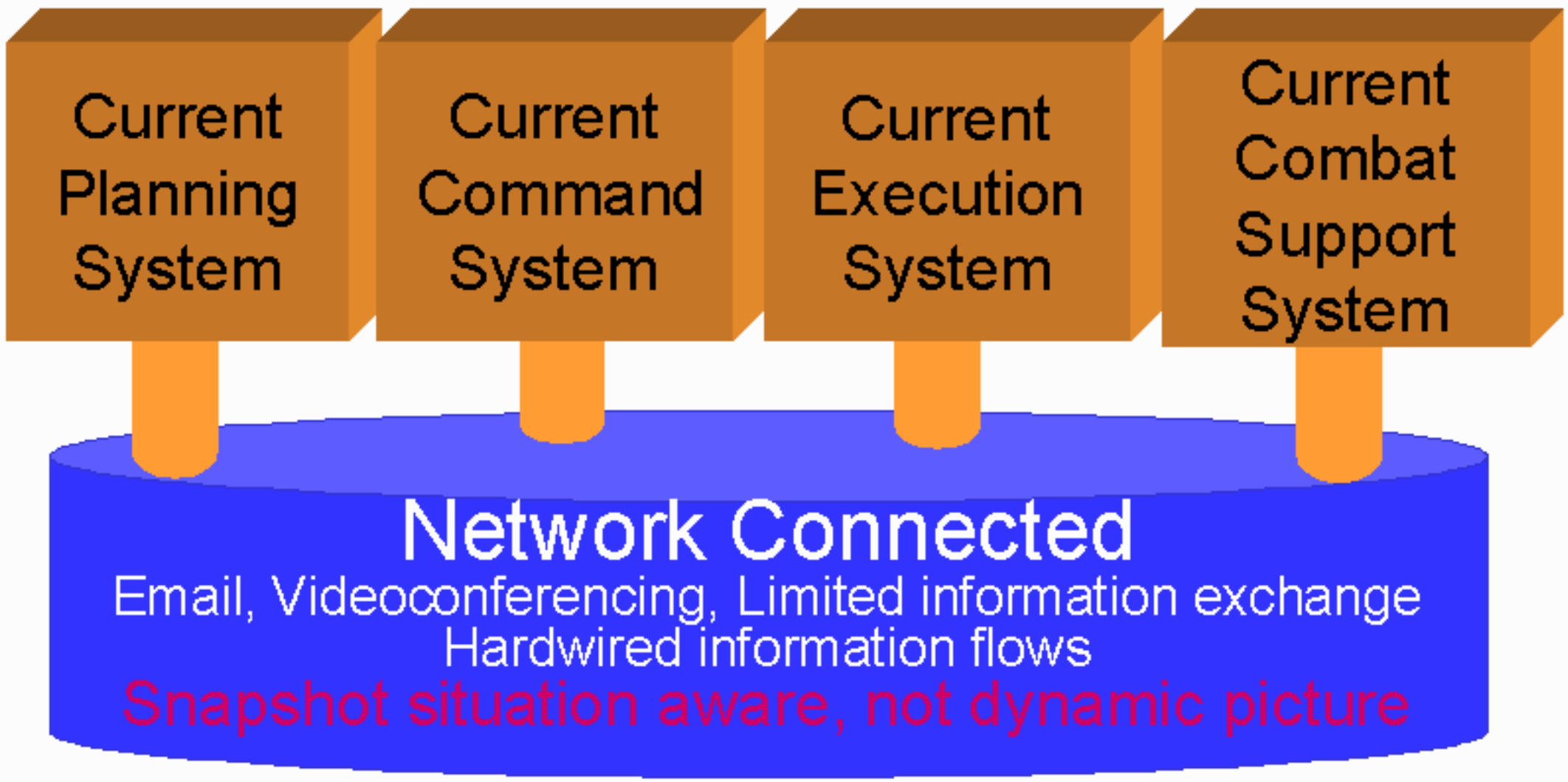


- CINC/JTF tailored view of information
  - Commander defines operational policies, concepts and access
  - Organized around operations
- Globally interoperable infrastructure and services
  - Global access - locally organized
  - Information sharing based on commander's intent

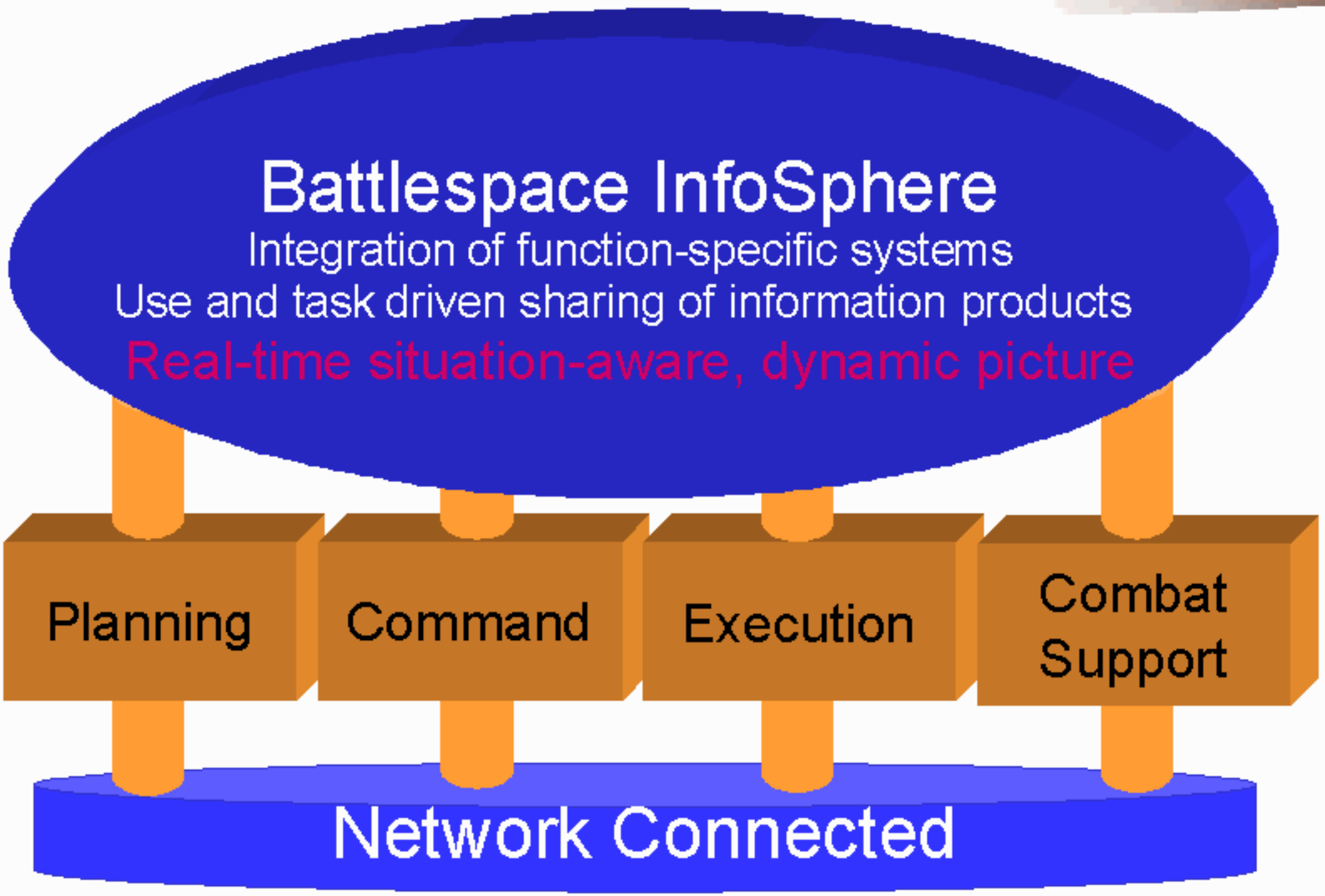
Battlespace InfoSphere
Combat Information System



Network-Centric Systems

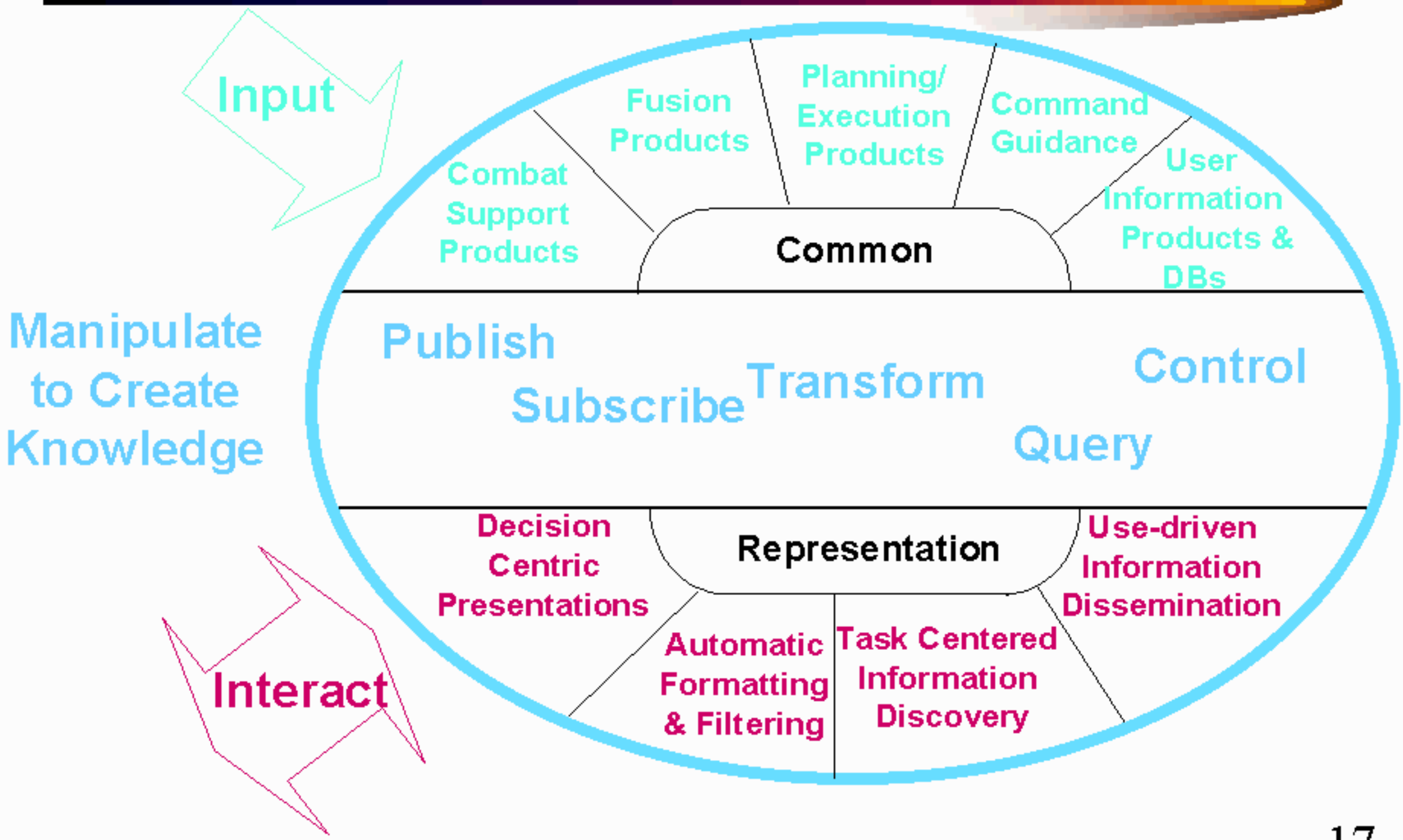


The BI: Information-Centric Systems … beyond network-centric systems



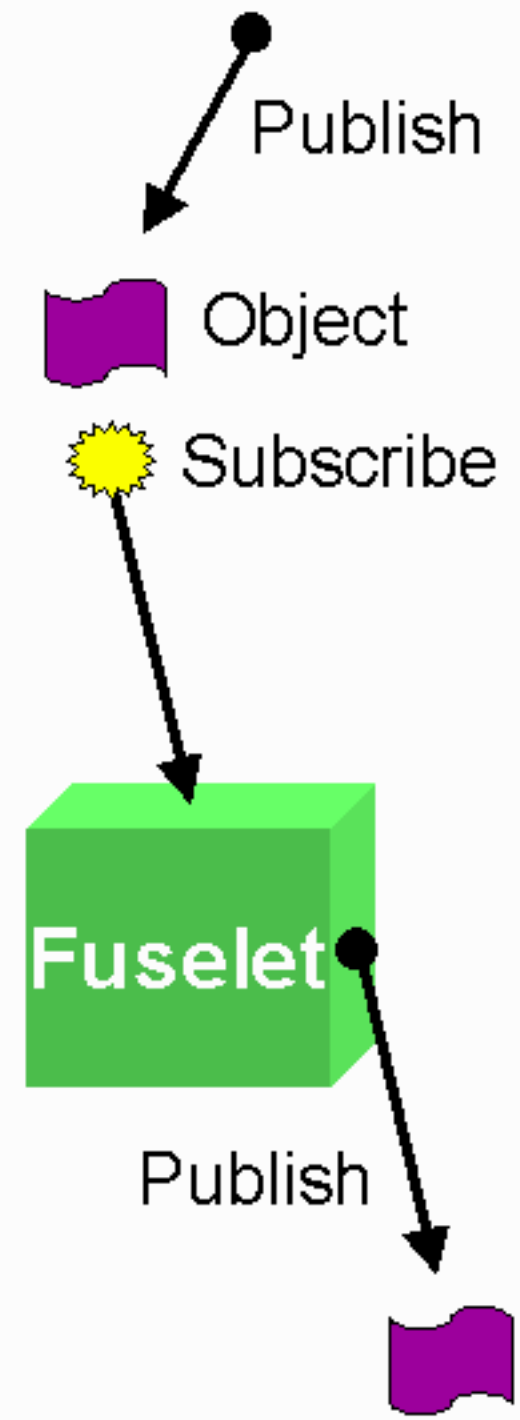
On-going DoD Programs

Inside the Battlespace InfoSphere



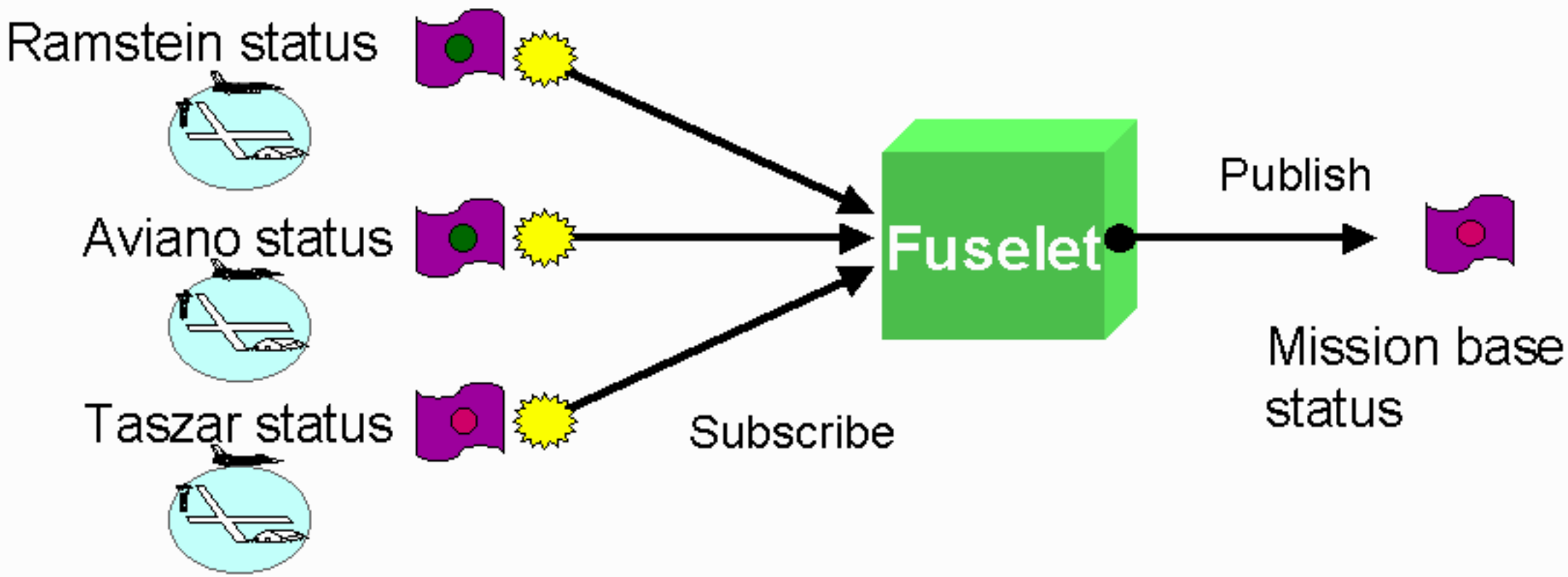
Manipulating Information in the BI

- Publish information objects to share with other BI participants
- Subscribe to objects to get new information the instant it's published in the BI
- Transform information by executing fuselet processes that can publish new objects, interact with people, or link to legacy applications
- Query the BI to find relevant information objects or to extract from databases
- Control performance, access, bandwidth allocation, and operation of the BI



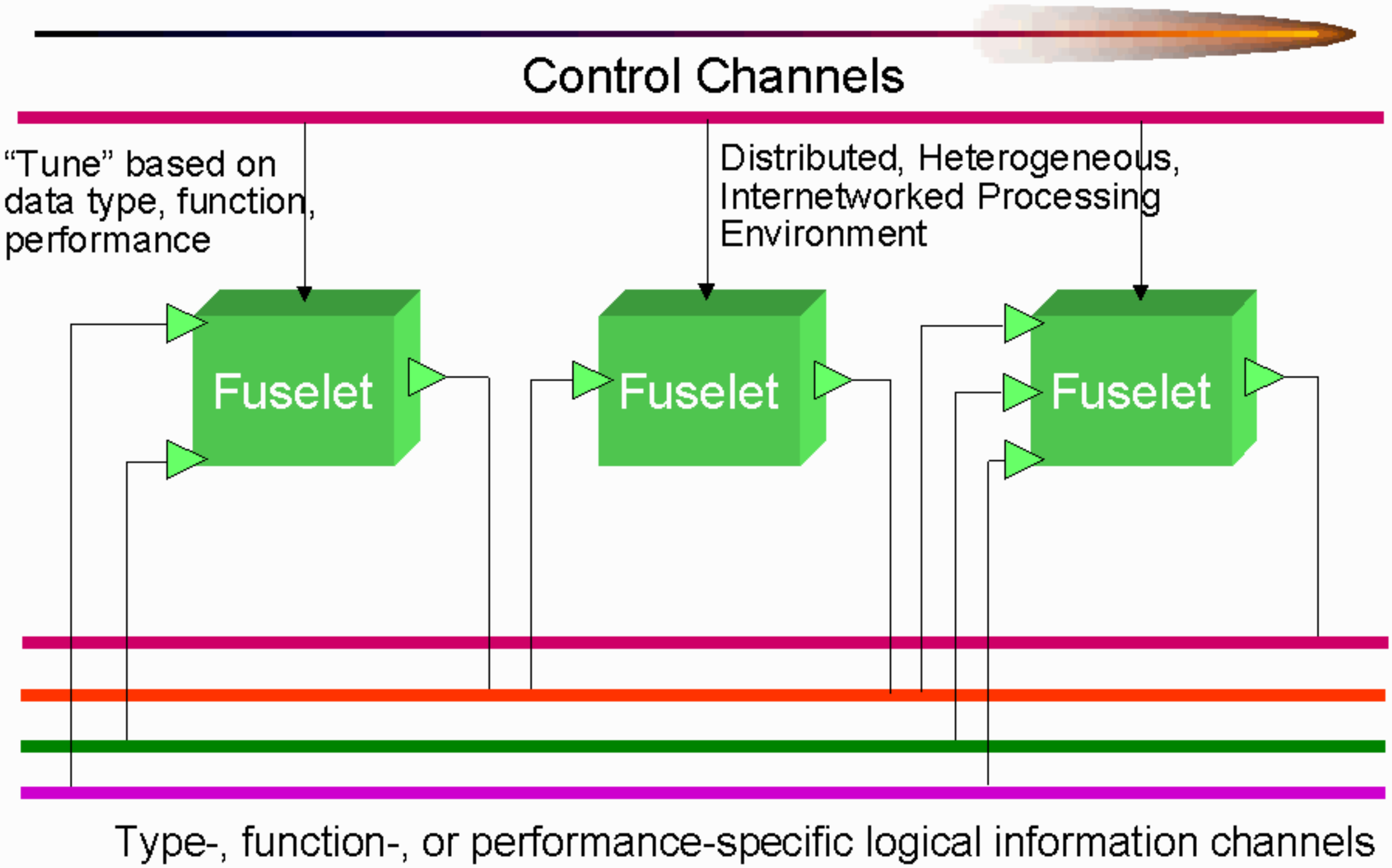
Example: fuselets that aggregate

- Each air base publishes a "base status" object to the BI. A fuselet that has subscribed to this type of object is triggered and publishes an aggregate "mission base status" object.

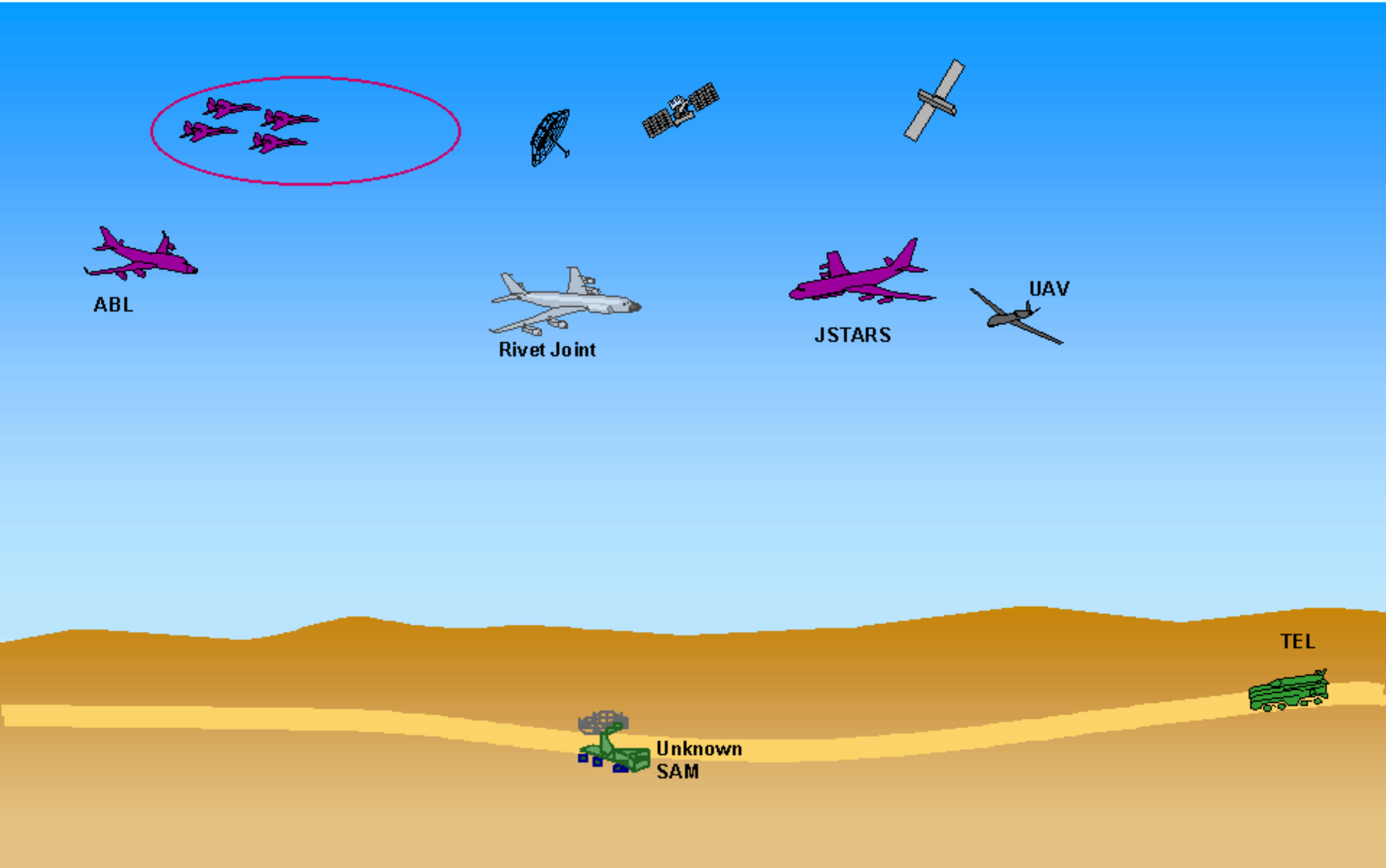


- Complex aggregation is achieved by cascading fuselets, forming higher-level knowledge.

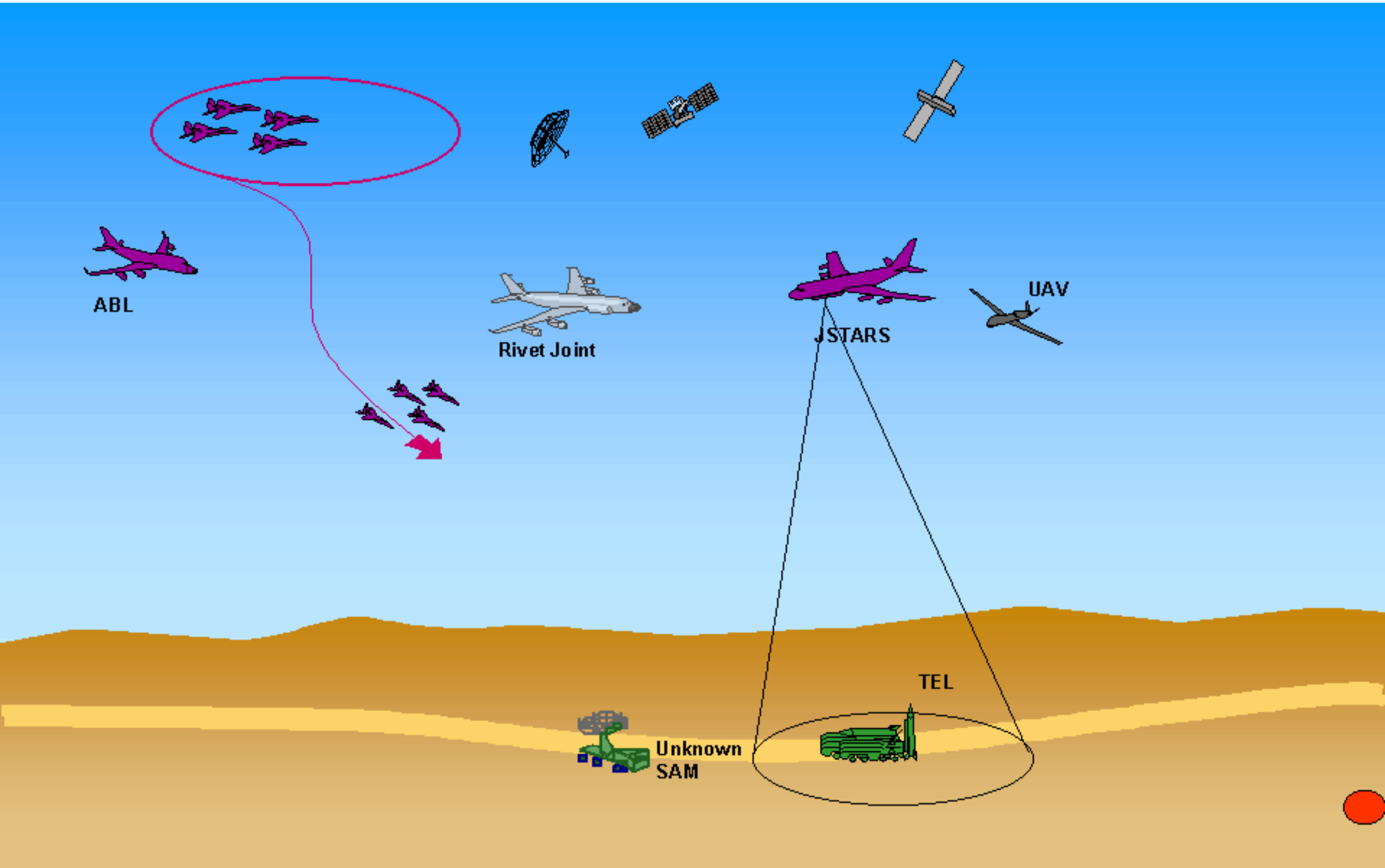
Fuselet Control Systems



Operational Vignette

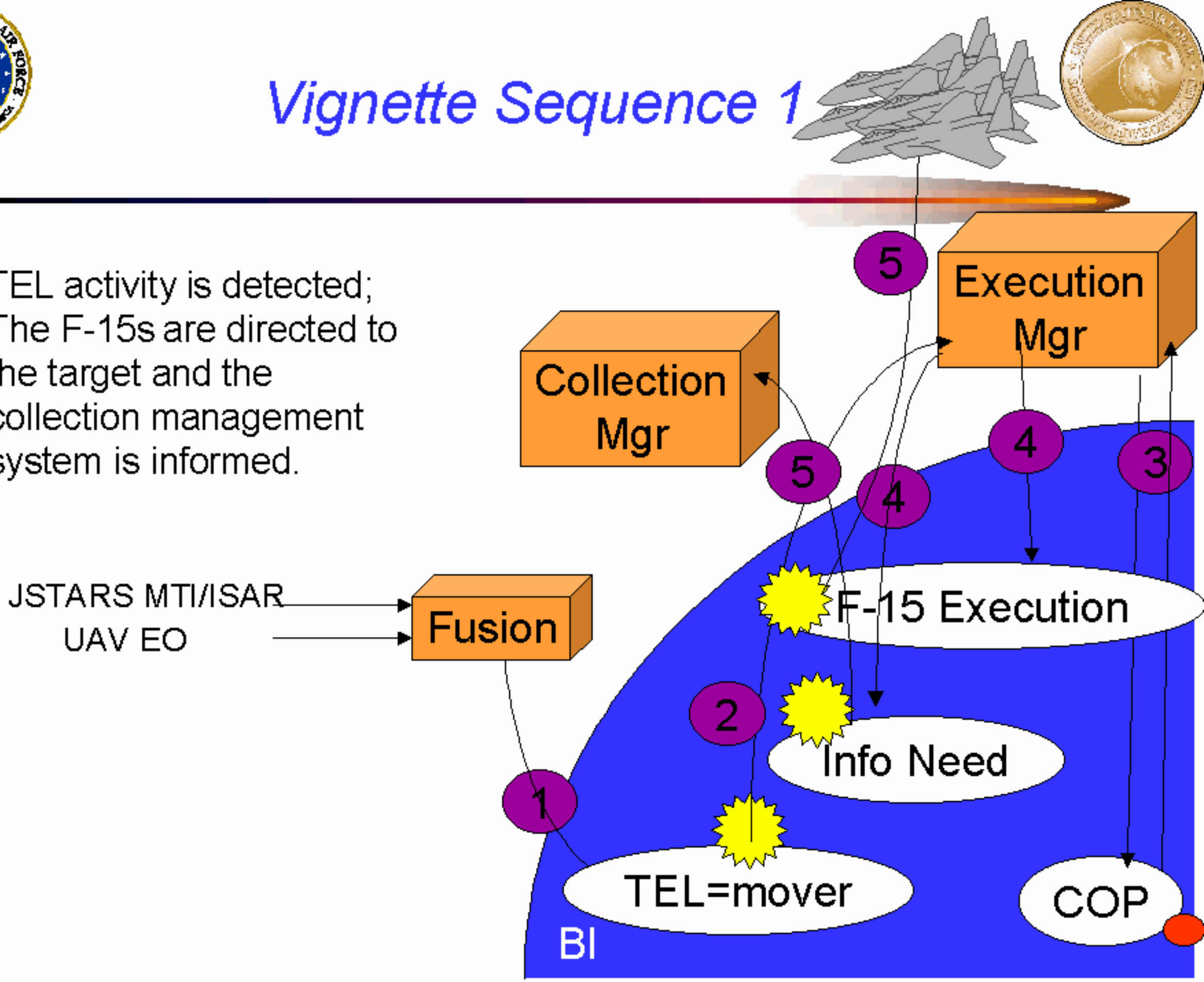


Operational Vignette 1

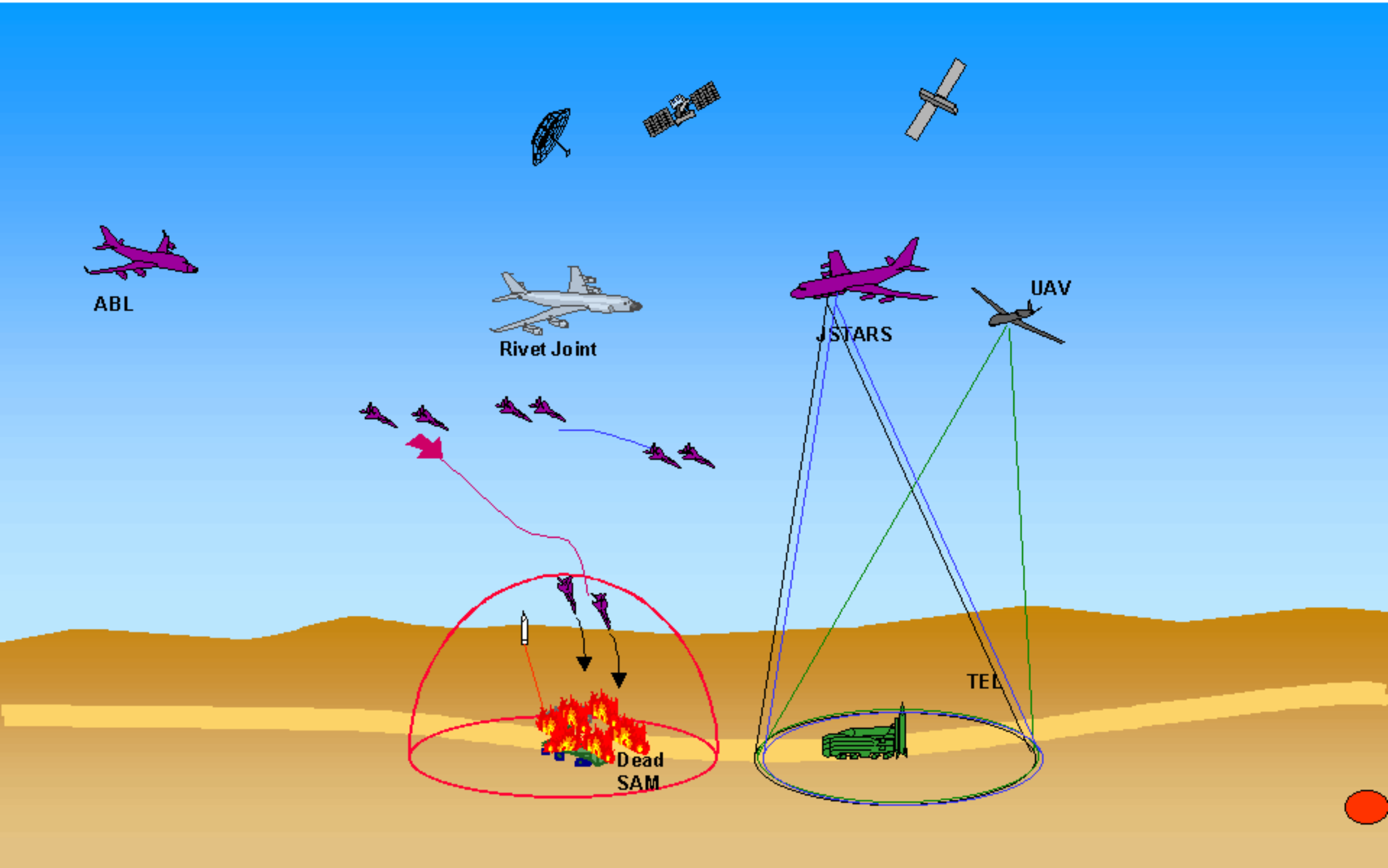


Vignette Sequence 1

- TEL activity is detected; The F-15s are directed to the target and the collection management system is informed.

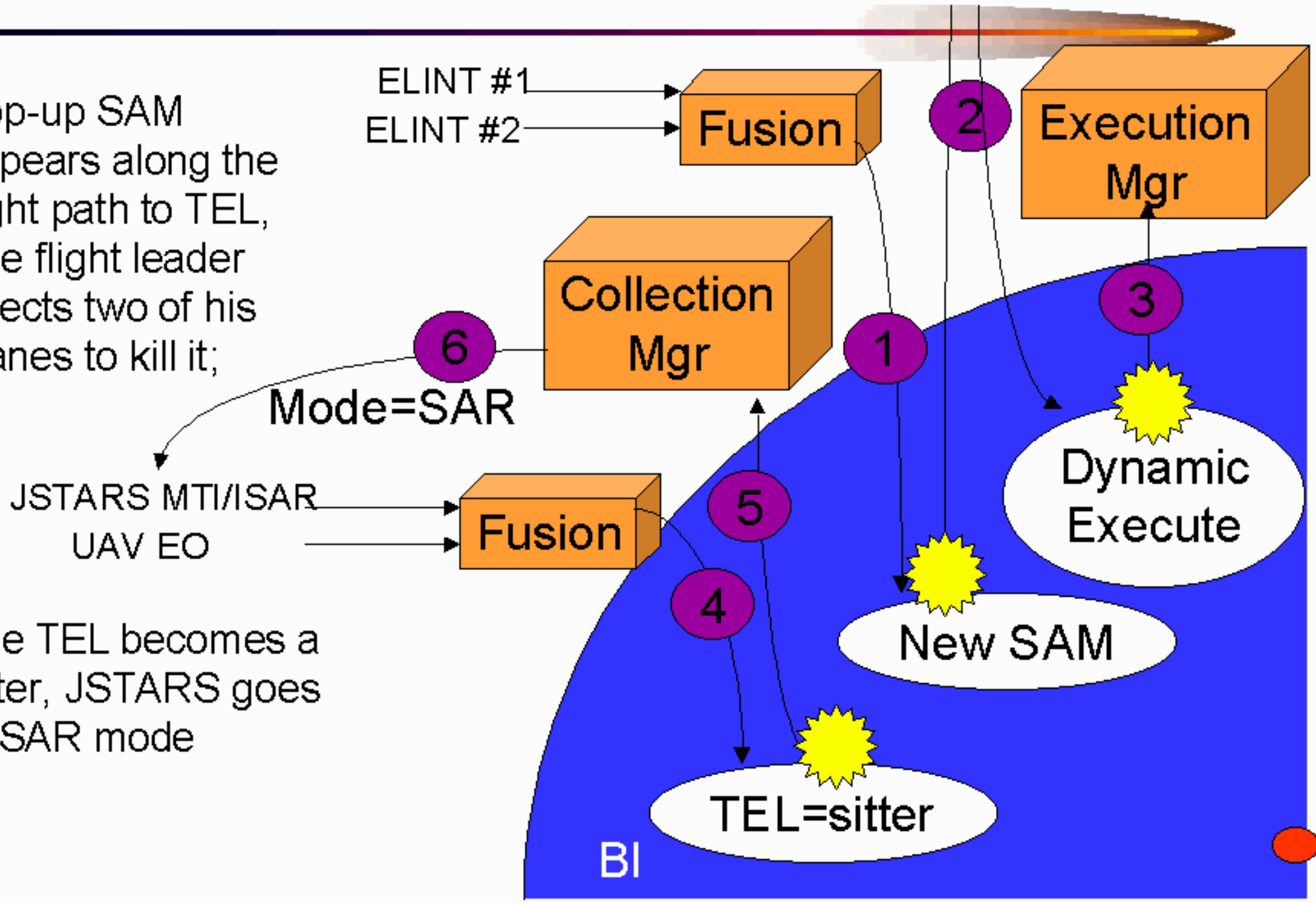


Operational Vignette 2

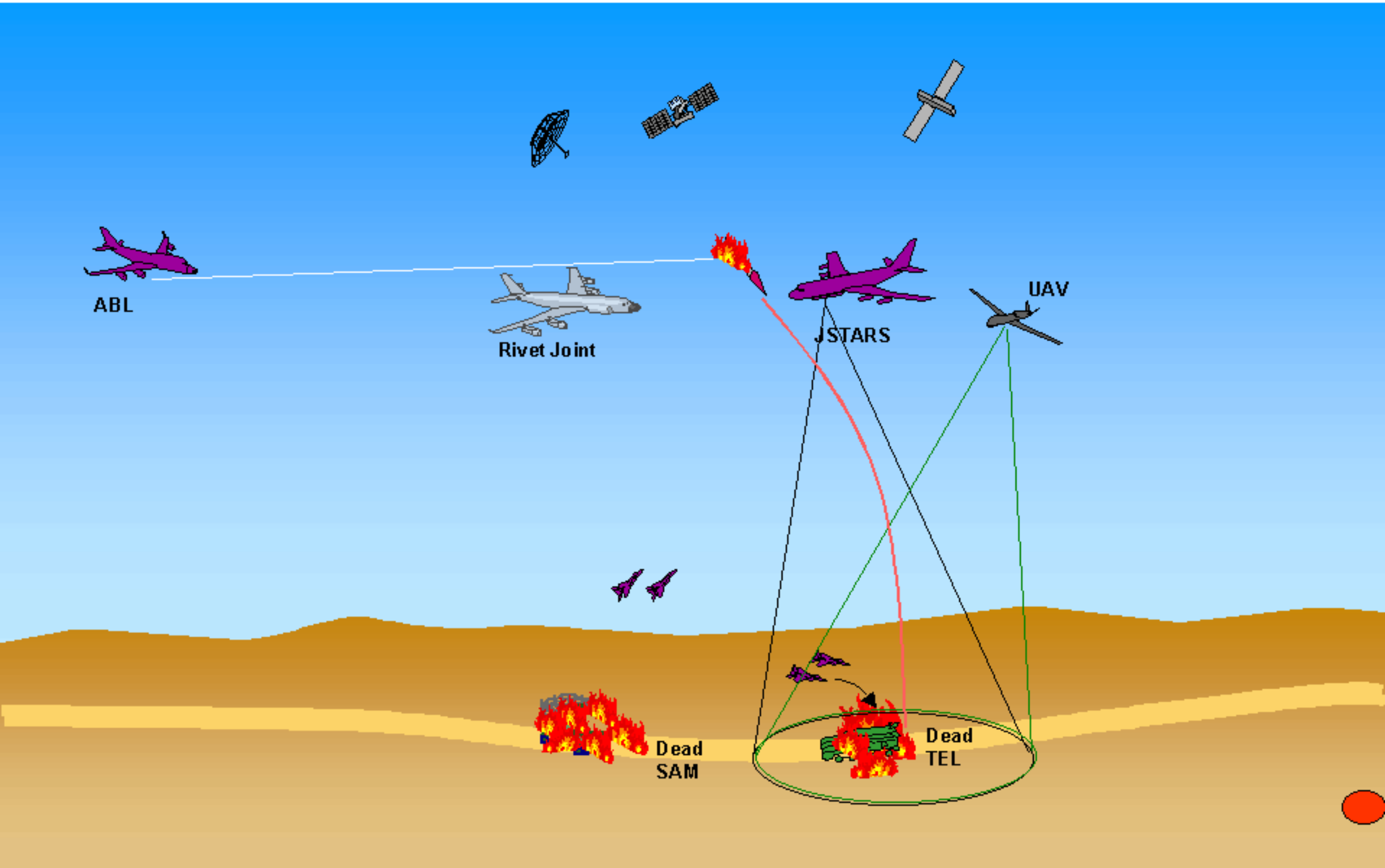


Vignette Sequence 2

- Pop-up SAM appears along the flight path to TEL, The flight leader directs two of his planes to kill it;
- The TEL becomes a sitter, JSTARS goes to SAR mode

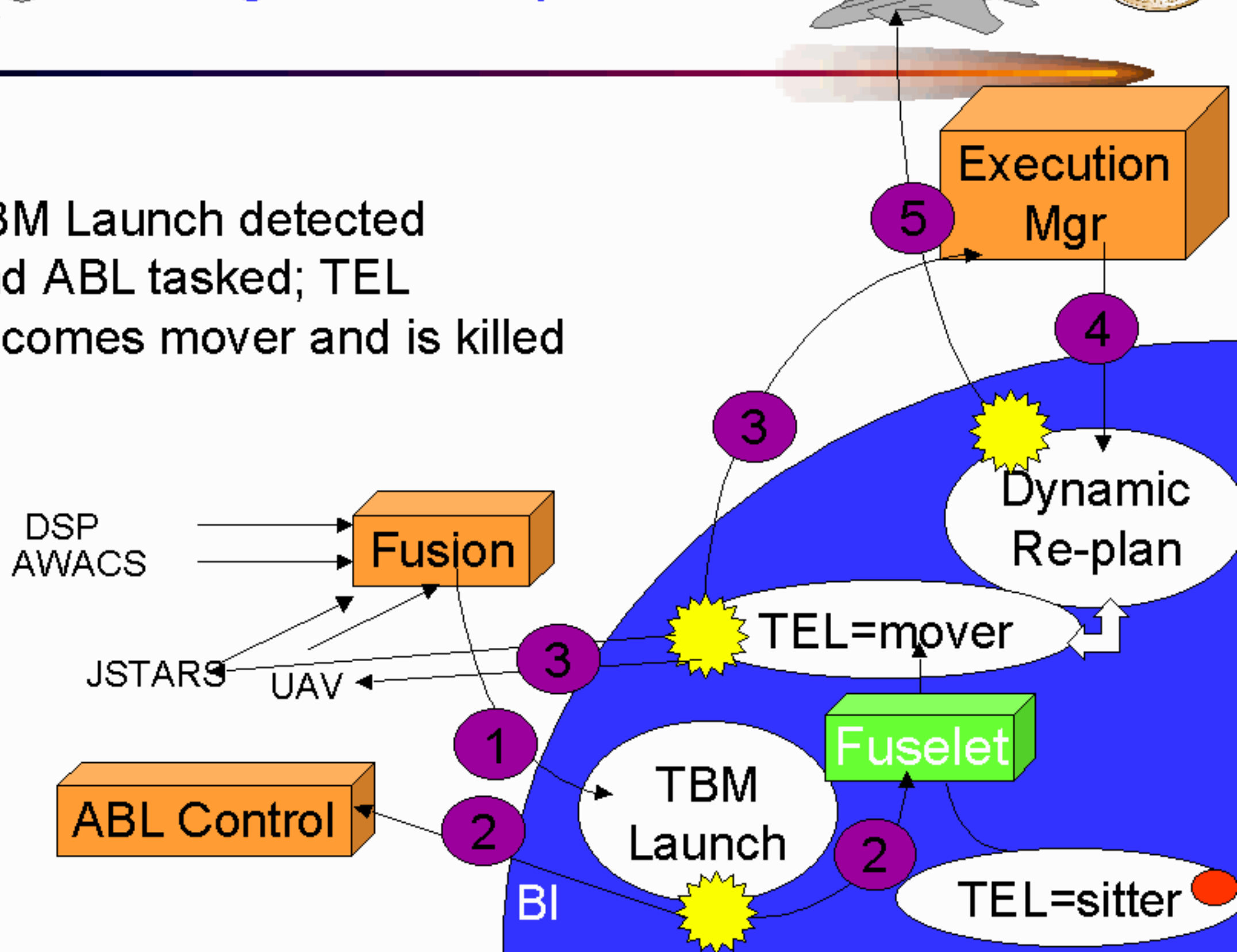


Operational Vignette 3



Vignette Sequence 3

- TBM Launch detected and ABL tasked; TEL becomes mover and is killed



Battlespace InfoSphere Benefits

…as demonstrated in the operational vignette

- Share information from multiple functions and systems instantly
  - reduce duplicated information retrieval and assembly
- Subscriptions route information to those who need it
  - geospatial and event tags are essential
  - high priority information flows quickly
  - subscriptions trigger real-time responses
- Transformation of information by fuselets is automatic
- Enables rapid decision cycles
- Knowledge of current and planned operations is widely shared

…the full Battlespace InfoSphere vision requires new technologies

Information Technologies Supporting the Battlespace InfoSphere

- We organized the technologies to support the BI into these categories:
  - input
  - manipulate
  - interact
- We ranked these technologies by maturity:
  - **Green**: ready to use COTS & GOTS
  - **Blue**: commercial R&D, 5 years
  - **Orange**: government R&D, 5 years
  - **Red**: not being done, needs programmatic support
- We also ranked by priority, key capabilities, and BI evolution

Candidate Technologies: Information Input

Identification & Authentication	Access & Translation	Upstream Information	Categorization
Source certificates Secure ID Source availability Source discovery Source ID	Multi-media data capture Wrapper technology Heterogeneous data integration Transformation techniques Capture plan data Meeting transcription	Tagging techniques Source characterization Capturing user intent Pedigree capture source processing	Domain-specific taxonomies & ontologies Relevance measures Expectation driven change detection

Candidate Technologies: Information Manipulation

Storage

- Multi-media storage
- Resource distribution management
- Multi-level secure storage
- Seamless access to tertiary storage
- High performance computing
- Backup and recovery
- High-density mass storage
- Data warehousing

Extraction

- Access control
- Agent technologies
- Intelligent push technology
- Intent inferencing
- Dynamic access control
- Information usage analysis
- User modeling

Decision Support

- Structuring
- Advice
- Uncertainty portrayal
- Tradeoff management

Aggregation & Fusion

- Video compression
- Wrapping legacy systems
- Information synchronization
- Geospatial & temporal indexing
- Object extraction for compression
- Meta-data language
- Data fusion
- Information life cycle
- Database mediation
- Rapid knowledge formation

Accessing

- Collaboration technologies
- Self-healing networks
- Multi-level access
- Parallel access for speed

Labeling

- Uncertainty
- Domain-specific taxonomies & ontologies

Understanding

- Dynamic situation modeling
- Sensitivity analysis

Candidate Technologies: Information Interaction

Routing

- Internet
- Dynamic bandwidth management
- Meta-networks

Transmission

- Assured delivery
- Non-repudiation
- Downstream tracking

Protection

- Encryption
- Recall of inaccurate information

Communication

- Conversational query
- Speech
- Natural language
- Annotation
- Domain-specific gesturing

Perception

- 3-D Visualization
- Natural Language
- Nontraditional senses
- Drill down
- 3-D audio
- Tailoring

User Modeling

- Information needs models
- Dialog management
- Context understanding
- Intent inferencing

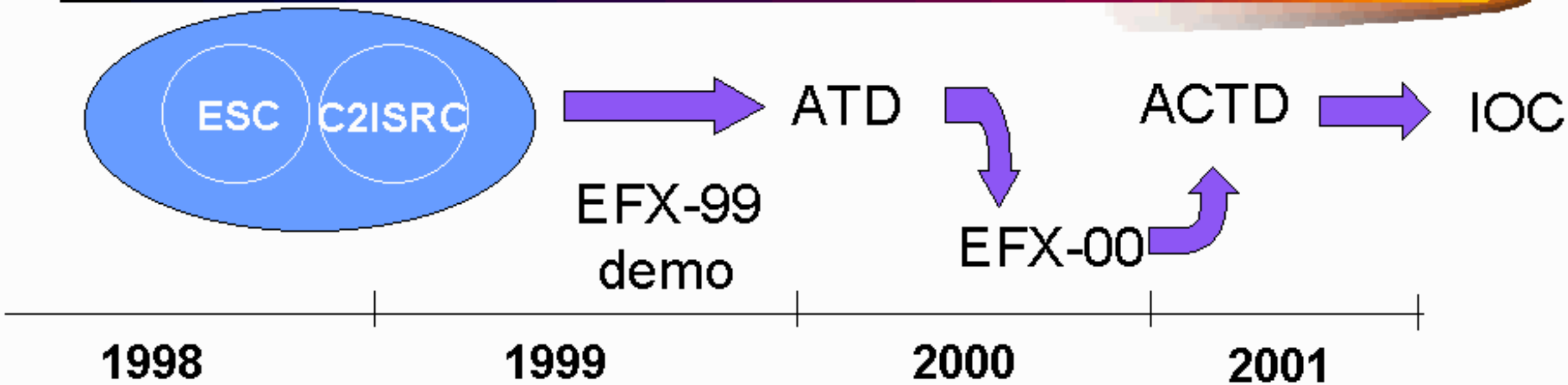
Collaboration

- Sharing
- Advanced white boarding
- Domain-specific workflow management
- Mixed initiative
- Facilitation

Battlespace InfoSphere Evolving Capabilities

Ready Now	Next 5 Years	Research
• Limited connection to legacy systems	• Semi-automated integration with legacy systems	• Total integration with legacy systems
• Rudimentary embedded fusion	• Complex, multi-source fusion	• Automated rule-based fusion
• Effective reachback	• Smaller, forward based infrastructure	• C2 embedded in BI
• More intelligent push, subscriptions	• Automated subscriptions	• Precision Guided Information (PGI)
• Shared data	• Shared information	• Shared knowledge

Battlespace InfoSphere Acquisition Strategy



- Co-locate ESC and C2ISRC assets with AOC Rear to build an operational capability through an accelerated development, test, and ops concept cycle
- Leverage Jointness in Tidewater area
- Consider for Billy Mitchell initiative
- Exploit the new acquisition model for rapidly adapting systems

Strategy for ATD/ACTD

- Elements of an Air Force sponsored ATD include
  - combat applications that can publish objects following the object definition
  - an initial definition of combat information objects, together with services for publish, subscribe, query, transform, and control
  - initial tools to permit interaction with the BI information
- Major object-oriented applications can be obtained from DARPA and other sources including: fusion (DMIF), collection management (AIM), planning (JFACC), combat support (ALP), global information exchange (GIE), and information dissemination management (IDM)
- The Air Force needs to do the detailed engineering for combat information objects and BI services
- An ACTD with leave-behind assets would follow

Use Integrated Development Processes for the Battlespace InfoSphere

Characteristics	F-22A	BI-1A
Management	X	X
discipline	X	X
Subsystems	X	X
Systems Integration	X	X
Operator certification	X	X
Logistics support	X	X
Block upgrades		

Apply similar cost-performance evaluation methods

Value of the Battlespace InfoSphere to the Air Force

- Provides the right information at the right time disseminated and displayed in the right way
- Provides knowledge and information leading to understanding
- Adapts to evolving situation and crisis events - simultaneously with other activities
- Provides shared knowledge of current and planned operations
- Enables very high-speed multiple decision cycles
- Consolidates current operational capabilities with integrated decision aids
- Improves data validity through trusted and accountable sources
- Reduces piecemeal system to system links
- Reduces duplication of effort in assembling and maintaining information

Actionable Recommendations

- Approve and adopt the Battlespace InfoSphere as an Air Force vision
- Integrate combat information resources
  - A single integrated structure
  - A single responsible organization
- Adopt the discipline of a major weapon system program with the speed of spiral development
- Rebalance Air Force information investments to achieve the Battlespace InfoSphere vision as soon as possible
- Seek Air Force leadership but ensure Joint development of the Battlespace InfoSphere

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	Web Site Internet Address
1	1	G	1	Input	B	Identification & Authentication	Source Certificates	A technique to verify that a source is a recognized supplier of information	Commercial	misc		
2	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
3	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
4	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
5	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
6	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
7	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
8	1	G	1	Input	B	Identification & Authentication	Source Certificates		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
9	1	G	1	Input	B	Identification & Authentication	Secure ID		Commercial	misc		
10	1	G	1	Input	B	Identification & Authentication	Secure ID		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
11	1	G	1	Input	B	Identification & Authentication	Secure ID		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
12	1	G	1	Input	B	Identification & Authentication	Secure ID		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
13	1	O	2	Input	A,B	Identification & Authentication	Source Availability	Monitoring access and availability, recover methods when access fails. The ability to predict or guarantee the	Commercial	Entertainment industry		
14	1	O	2	Input	A,B	Identification & Authentication	Source Availability		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
15	1	B	3	Input	A,B	Identification & Authentication	Source Discovery	Validating or certifying information sources. The ability to locate a new source of information, based on an information need specification	DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
16	1	B	3	Input	A,B	Identification & Authentication	Source Discovery		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
17	2	O	2	Input	B	Identification & Authentication	Source ID		NSA			
18	2	O	2	Input	B	Identification & Authentication	Source ID		NRL	ONR 6.2 Verification	C. Landwehr	http://www.nrl.navy.mil/
19	1	B	1	Input	B,C	Access & Translation	Multi-media data capture	The ability to interpret multi-media information sufficiently to provide meta-data, extract objects out of a data stream	DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
20	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
21	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
22	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
23	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
24	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
25	1	B	1	Input	B,C	Access & Translation	Multi-media data capture		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
26	1	O	1	Input	B	Access & Translation	Wrapper Technology		AFRL/IF	Broadsword	John Salerno	http://www.if.afrl.af.mil/tech/programs/bsword/
27	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	JTF ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
28	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
29	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
30	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
31	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
32	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
33	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
34	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
35	1	O	1	Input	B	Access & Translation	Wrapper Technology		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
36	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA	Information Management	Larsen	http://www.darpa.mil/
37	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		ESC	Common Data Environment	Jay Scarano	http://www.hanscom.af.mil/
38	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
39	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
40	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
41	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
42	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
43	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
44	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
45	1	O	1	Input	B,C	Access & Translation	Heterogeneous Data Integration		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
46	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
47	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
48	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
49	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
50	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
51	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
52	1	O	1	Input	B,D	Access & Translation	Transformation Techniques		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
53	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
54	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
55	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	ASTT	Dell Lunceford	http://dtsn.darpa.mil/iso/
56	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
57	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
58	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
59	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
60	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
61	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
62	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
63	1	O	2	Input	B,C	Access & Translation	Capture plan Data		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
64	2	O	1	Input	B	Access & Translation	Meeting Transcription	A specific form of multimedia data capture. This refers to automatic analysis of audio from a meeting.	DARPA	Genoa (CMU, CVIM)		http://www.darpa.mil/
65	2	O	1	Input	B	Access & Translation	Meeting Transcription		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
66	2	O	1	Input	B	Access & Translation	Meeting Transcription		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
67	1	O	1	Input	D	Upstream Information	Tagging techniques	Representation models for data: e.g. geospatial, temporal, security, etc. Techniques to identify key characteristics of the data, that will be needed for access and information	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
68	1	O	1	Input	D	Upstream Information	Tagging techniques		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
69	1	O	1	Input	D	Upstream Information	Tagging techniques		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
70	1	O	1	Input	D	Upstream Information	Tagging techniques		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
71	1	O	1	Input	D	Upstream Information	Tagging techniques		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
72	1	O	2	Input	B	Upstream Information	Source Characterization	The ability to capture relevant information about the source of data. Data Mediation	ESC	Data Mediation for the Command and Control system of the Future	Jay Scarano	http://www.hanscom.af.mil/
73	1	O	2	Input	B	Upstream Information	Source Characterization	The ability to capture relevant information about the source of data. Data Mediation	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
74	1	O	2	Input	B	Upstream Information	Source Characterization		DARPA ISO	DDB	Robert Beaton	http://dtsn.darpa.mil/iso/
75	1	O	2	Input	B	Upstream Information	Source Characterization		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
76	1	R	2	Input	A,B	Upstream Information	Capturing User Intent	Capturing important information about the user's intent when data was generated.	DARPA	CPOF		http://www-code44.spawar.navy.mil/cpof/
77	1	R	2	Input	A,B		Capturing User Intent		DARPA	ARPI		
78	1	R	2	Input	A,B		Capturing User Intent		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
79	1	R	2	Input	A,B		Capturing User Intent		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
80	1	R	2	Input	A,B		Capturing User Intent		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
81	1	R	2	Input	A,B		Capturing User Intent		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
82	1	R	2	Input	A,B		Capturing User Intent		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
83	1	O	3	Input			Pedigree Capture = source processing	Representation of credibility, appropriateness, trust and confidence of sources the ability to capture relevant information about the processing history of a piece of information, input data, processes, etc.	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
84	1	O	3	Input			Pedigree Capture = source processing		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
85	1	O	3	Input			Pedigree Capture = source processing		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
86	1	O	3	Input			Pedigree Capture = source processing		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
87	1	O	3	Input			Pedigree Capture = source processing		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
88	2	R	2	Input	C,D	Categorization	Relevance (task, data)	The ability to determine value of a piece of information to a particular context.	DARPA	DDB		http://www.darpa.mil/
89	2	R	2	Input	C,D	Categorization	Relevance (task, data)		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
90	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
91	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
92	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
93	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
94	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
95	1	O	2	Input	C	Categorization	Ontologies & Taxonomies		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
96	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
97	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
98	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	MSTAR	Robert Hummel	http://dtsn.darpa.mil/iso/
99	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
100	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
101	2	O	2	Input	D	Categorization	Expectation driven change detection		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
102	1	G	1	Manipulation	A	Storage	Multi-media Storage	Voice, video, text, imagery, SAR	Commercial			
103	1	G	1	Manipulation	A	Storage	Multi-media Storage		DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
104	1	G	1	Manipulation	A	Storage	Multi-media Storage		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
105	1	G	1	Manipulation	A	Storage	Multi-media Storage		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
106	1	G	1	Manipulation	A	Storage	Multi-media Storage		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
107	1	O	2	Manipulation	A	Storage	Resource Distribution Management	redundant with resource distribution management	DARPA/ISO	JTF ATD - Replication services	Ref DelGado	http://dtsn.darpa.mil/iso/
108	1	R	2	Manipulation	A	Storage	Multi-level secure storage	self explanatory	NSA	Dynamic Databases		
109	1	R	2	Manipulation	A	Storage	Multi-level secure storage		DARPA	DDB	Tom Burns	http://www.darpa.mil/
110	1	R	2	Manipulation	A	Storage	Multi-level secure storage		NRL	Dara Pump, SINTRA	C. Landwehr	http://www.nrl.navy.mil/
111	1	R	2	Manipulation	A	Storage	Multi-level secure storage		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
112	1	R	2	Manipulation	A	Storage	Multi-level secure storage		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
113	2	B	2	Manipulation	A	Storage	Seamless access to tertiary storage	Dynamic allocation of database - for terabyte storage	Commercial	Teradata & NCR		
114	2	B	2	Manipulation	A	Storage	Seamless access to tertiary storage		NRL	CCS Archive	G. Heinle heinle@cmf.nrl.navy.mil	http://www.nrl.navy.mil/
115	2		2	Manipulation	D	Storage	High performance computing		NRL	CMF HPC Facility	H. Dardy	http://www.nrl.navy.mil/
116	3	G	1	Manipulation	A	Storage	Backup & Recovery	How to bring a database back on line	Commercial			
117	3	G	1	Manipulation	A	Storage	Backup & Recovery		NRL	CMF HPC Facility	G. Heinle	http://www.nrl.navy.mil/
118	3	O	1	Manipulation	A	Storage	High Density Mass Storage	Large dense memory (optical, 'sugar cube', Pond Scum, DNA, etc.)	AFRL/IF	3d memory		http://www.if.afrl.af.mil/
119	3	B	2	Manipulation	A	Storage	Data warehousing	Collecting and aggregating information in advance of query	Commercial			
120	3	B	2	Manipulation	A	Storage	Data warehousing		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
121	3	B	2	Manipulation	A	Storage	Data warehousing		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
122	1	G	2	Manipulation	D	Extraction	Access control	Enforcement and auditing of security or "need to know" privileges	Commercial	Trusted Oracle 7 - commercially available		
123	1	G	2	Manipulation	D	Extraction	Access control		DARPA	Defensive Info Warfare		http://www.darpa.mil/
124	1	G	2	Manipulation	D	Extraction	Access control		AFRL/IF	Defensive Info Warfare		http://www.if.afrl.af.mil/
125	1	G	2	Manipulation	D	Extraction	Access control		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
126	1	G	2	Manipulation	D	Extraction	Access control		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
127	1	B	1	Manipulation	C,D	Extraction	Agent Technologies	Agents supply information based on background processes that evaluate relevance of information	DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
128	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
129	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
130	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
131	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
132	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
133	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
134	1	B	1	Manipulation	C,D	Extraction	Agent Technologies		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
135	1	O	2	Manipulation	D	Extraction	Intelligent Push Technologies	Information dissemination servers - providing GBS info on demand	DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
136	1	O	2	Manipulation	D	Extraction	Intelligent Push Technologies	Transcription, topic detection and tracking, Fact extraction	DARPA/ISO	TRVS		http://dtsn.darpa.mil/iso/
137	1	O	2	Manipulation	D	Extraction	Intelligent Push Technologies		AFRL/IF	Broadsword	Dr. John Salerno	http://www.if.afrl.af.mil/tech/programs/bsword/
138	1	O	2	Manipulation	D	Extraction	Intelligent Push Technologies		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
139	1	O	2	Manipulation	D	Extraction	Intelligent Push Technologies		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
140	1	R	2	Manipulation	D	Extraction	Intent Inferencing		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
141	1	R	2	Manipulation	D	Extraction	Intent Inferencing	Improved search and retrieval based on agent estimates of user request intent	DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
142	1	R	2	Manipulation	D	Extraction	Intent Inferencing		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
143	1	R	2	Manipulation	D	Extraction	Intent Inferencing		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
144	1	R	2	Manipulation	D	Extraction	Intent Inferencing		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
145	1	R	2	Manipulation	D	Extraction	Intent Inferencing		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
146	1	R	3	Manipulation	D	Extraction	Dynamic Access control	Adjustable access criteria according to aggregated content and criticality of decisions underway	DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
147	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
148	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
149	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	JFACC	Ref Dellgado	http://dtsn.darpa.mil/iso/
150	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
151	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
152	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
153	1	R	3	Manipulation	D	Extraction	Dynamic Access control		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
154	2	O	3	Manipulation	A	Extraction	Information Usage Analysis	Automatic courses of action analysis	DARPA ISO	COAA	Doug Dyer	http://dtsn.darpa.mil/iso/
155	2	O	3	Manipulation	D	Extraction	User modeling		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
156	2	O	3	Manipulation	D	Extraction	User modeling		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
157	2	O	3	Manipulation	D	Extraction	User modeling		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
158	2	O	3	Manipulation	D	Extraction	User modeling		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
159	2	O	3	Manipulation	D	Extraction	User modeling		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
160	1	O	1	Manipulation	C	Decision Support	Structuring	Representation of alternatives, attributes, consequences, etc.	AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
161	1	O	1	Manipulation	C	Decision Support	Structuring		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
162	1	O	1	Manipulation	C	Decision Support	Structuring		NSF	Automated Problem Structuring Techniques		http://www.nsf.gov/cgi-bin/showaward?award=9060164
163	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA/ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
164	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA/IS	C2 Programs		http://dtsn.darpa.mil/iso/
165	1	O	1	Manipulation	C	Decision Support	Structuring		SSC-SD		J. Morrison	http://www.spawar.navy.mil/sandiego/welcome.page
166	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
167	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
168	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA ISO	COAA	Doug Dyer	http://dtsn.darpa.mil/iso/
169	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
170	1	O	1	Manipulation	C	Decision Support	Structuring		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
171	1	O	2	Manipulation	C	Decision Support	Advice	Recommended courses of action	RL	ARPI	R. Metzger	http://arpi.isx.com/
172	1	O	2	Manipulation	C	Decision Support	Advice		AFRL/IF	Joint Targeting Toolkit	J. Palermo	http://www.if.afrl.af.mil/
173	1	O	2	Manipulation	C	Decision Support	Advice		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
174	1	O	2	Manipulation	C	Decision Support	Advice		DARPA	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
175	1	O	2	Manipulation	C	Decision Support	Advice		SSC-SD		Morrison/Larsen	http://www.spawar.navy.mil/sandiego/welcome.page
176	1	O	2	Manipulation	C	Decision Support	Advice		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
177	1	O	2	Manipulation	C	Decision Support	Advice		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
178	1	O	2	Manipulation	C	Decision Support	Advice		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
179	1	O	2	Manipulation	C	Decision Support	Advice		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
180	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal	Representation of missing, unreliable, indeterminate, & complex info.	AFRL/IF	HPKB	C. Anken	http://www.teknowledge.com/hpkb/
181	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
182	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
183	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		NSF	Multiple Objectives, Risk Evaluation and Visualization		http://www.nsf.gov/cgi-bin/showaward?award=9634336
184	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		NASA	Involuntary Covert Orienting		http://olias.arc.nasa.gov/cognition/temp/roger/frj92paper/frj92.html
185	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA/IS	Exploitation	Garvey/Strat	http://dtsn.darpa.mil/iso/
186	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		AFOSR		T. Poggio	http://www.ai.mit.edu/projects/cbcl/
187	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		SSC-SD		R. Smillie	http://www.spawar.navy.mil/sandiego/welcome.page
188	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
189	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
190	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA STO	MTE	Bruce Johnson	http://www.darpa.mil/
191	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
192	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
193	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
194	2	O	1	Manipulation	C,E	Decision Support	Uncertainty portrayal		DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
195	2	O	2	Manipulation	C	Decision Support	Tradeoff management	Representation and assessment of benefits and costs	AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
196	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA	ARPI		http://www.darpa.mil/
197	2	O	2	Manipulation	C	Decision Support	Tradeoff management		NSF	Decision Support for Managing Performance Risk		
198	2	O	2	Manipulation	C	Decision Support	Tradeoff management		NASA	Managing Multiple Tasks in Complex, Dynamic Environments		http://olias.arc.nasa.gov/cognition/papers/freed/aaai98.html
199	2	O	2	Manipulation	C	Decision Support	Tradeoff management		NRL	6.2 & 6.3 Planning	J. Hoffman	http://www.nrl.navy.mil/
200	2	O	2	Manipulation	C	Decision Support	Tradeoff management		SSC-SD		R. Larsen	http://www.spawar.navy.mil/sandiego/welcome.page
201	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
202	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
203	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
204	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
205	2	O	2	Manipulation	C	Decision Support	Tradeoff management		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
206	1	G	1	Manipulation	B	Aggregation & Fusion	Video Compression	Commercial media compression.	Commercial			
207	1	G	1	Manipulation	B	Aggregation & Fusion	Video Compression		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
208	1	G	2	Manipulation	B	Aggregation & Fusion	Video Compression	Recognition of the changed portion of the picture and compression/transmission of only the changed pixels.	DARPA/ISO	(MPEG) - Image Bandwidth Compression		http://dtsn.darpa.mil/iso/
209	1	G	2	Manipulation	B	Aggregation & Fusion	Video Compression		DARPA ISO	IBC	Robert Hummel	http://dtsn.darpa.mil/iso/
210	1	G	2	Manipulation	B	Aggregation & Fusion	Video Compression		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
211	1	O	1	Manipulation	B	Aggregation & Fusion	Wrapping legacy systems	Preparing legacy systems to participate in the InfoSphere	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
212	1	O	1	Manipulation	B	Aggregation & Fusion	Wrapping legacy systems		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
213	1	O	1	Manipulation	B	Aggregation & Fusion	Wrapping legacy systems		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
214	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization	Finding, linking & fusing of information that is related	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
215	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
216	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
217	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
218	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
219	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
220	1	O	1	Manipulation	A	Aggregation & Fusion	Information Synchronization		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
221	1	O	1	Manipulation	D	Aggregation & Fusion	Geospatial & temporal indexing	Standards for reporting	NIMA			
222	1	O	1	Manipulation	D	Aggregation & Fusion	Geospatial & temporal indexing		DARPA/ISO	Dynamic Data Base	Tom Burns	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
223	1	O	1	Manipulation	D	Aggregation & Fusion	Geospatial & temporal indexing	information (WGS-84	DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
224	1	O	1	Manipulation	D	Aggregation & Fusion	Geospatial & temporal indexing		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
225	1	O	2	Manipulation	B	Aggregation & Fusion	Object extraction for compression		DARPA/ISO	I BC, MSTARS	Tom Burns	http://dtsn.darpa.mil/iso/
226	1	O	2	Manipulation	B	Aggregation & Fusion	Object extraction for compression		DARPA ISO	IBC	Robert Hummel	http://dtsn.darpa.mil/iso/
227	1	O	2	Manipulation	C	Aggregation & Fusion	Meta-data language	A language in which other languages can be described. A language for agents to talk to one another	DARPA	CoABS	Doug Dyer	http://dtsn.darpa.mil/iso/
228	1	O	2	Manipulation	C	Aggregation & Fusion	Meta-data language		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
229	1	O	2	Manipulation	C	Aggregation & Fusion	Meta-data language		DARPA STO	MTE	Bruce Johnson	http://www.darpa.mil/
230	1	O	2	Manipulation	C	Aggregation & Fusion	Meta-data language		DARPA ISO	IU	George Lukes	http://dtsn.darpa.mil/iso/
231	1	O	2	Manipulation	C	Aggregation & Fusion	Meta-data language		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
232	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion	Automated analysis of info to produce new products	AFRL/IF	Enhanced All Source Fusion		http://www.if.afrl.af.mil/
233	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
234	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
235	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion		DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
236	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion		DARPA ISO	MSTAR	Robert Hummel	http://dtsn.darpa.mil/iso/
237	1	O	3	Manipulation	C,D	Aggregation & Fusion	Data fusion		DARPA STO	MTE	Bruce Johnson	http://www.darpa.mil/
238	2	R	2	Manipulation	A	Aggregation & Fusion	Information life cycle	Maintenance of information currency & history, and knowing when to get rid of data	DARPA/ISO	IA program	Sadjari	http://dtsn.darpa.mil/iso/
239	2	R	2	Manipulation	A	Aggregation & Fusion	Information life cycle		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
240	2	R	2	Manipulation	A	Aggregation & Fusion	Information life cycle		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
241	2	R	2	Manipulation	A	Aggregation & Fusion	Information life cycle		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
242	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation	Analyzing and interpreting information	DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
243	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
244	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
245	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
246	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
247	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
248	2	O	3	Manipulation	D	Aggregation & Fusion	Database mediation		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
249	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation	Data mining on steroids	AFRL/IF	Video Exorcist		http://www.if.afrl.af.mil/
250	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation		DARPA	Rapid Knowledge Formation		http://www.darpa.mil/
251	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
252	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
253	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation	Intelligent integration of information	DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
254	3	O	3	Manipulation	C	Aggregation & Fusion	Rapid knowledge formation		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
255	1	B	1	Manipulation	D	Accessing	Collaboration technologies	Two or more individuals or systems collaborate with one another	ESC	CVW		http://www.hanscom.af.mil/
256	1	B	2	Manipulation	D	Accessing	Collaboration technologies		Commercial	Lotusnotes, Placewares, Netmeeting, etc.		
257	1	B	2	Manipulation	D	Accessing	Collaboration technologies		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
258	1	B	2	Manipulation	D	Accessing	Collaboration technologies		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
259	1	B	2	Manipulation	D	Accessing	Collaboration technologies		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
260	1	B	2	Manipulation	D	Accessing	Collaboration technologies		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
261	1	B	2	Manipulation	D	Accessing	Collaboration technologies		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
262	1	O	2	Manipulation	A	Accessing	Self-healing networks	Restoring networks as they suffer breakage	AFRL/IF	SurvNet		http://www.if.afrl.af.mil/
263	1	O	2	Manipulation	A	Accessing	Self-healing networks		DARPA/ISO	Active Networks		http://dtsn.darpa.mil/iso/
264	1	O	2	Manipulation	A	Accessing	Self-healing networks		NRL	Networking 6.1 & 6.2	J. Wieseltheir	http://www.nrl.navy.mil/
265	1	O	2	Manipulation	A	Accessing	Self-healing networks		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
266	1	R	2	Manipulation	D	Accessing	Multi-level access (e.g. for security management)	Reaching in and pulling it out for labeling	DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
267	1	R	2	Manipulation	D	Accessing	Multi-level access (e.g. for security management)		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
268	2	O	2	Manipulation	D	Accessing	Parallel access for speed	Multiple processor database access	Commercial	Inktomi		
269	2	O	2	Manipulation	D	Accessing	Parallel access for speed		SPAWAR	Heterogenous network access	Richard Freund	http://www.spawar.navy.mil/sandiego/welcome.page
270	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA/ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
271	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
272	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA STO	MTE	Bruce Johnson	http://www.darpa.mil/
273	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
274	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
275	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
276	1	O	2	Manipulation	C	Labeling	Uncertainty		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
277	2	O	1	Manipulation	C	Labeling	Domain Specific Taxonomies & Ontologies		DARPA/ISO	HPKP		http://dtsn.darpa.mil/iso/
278	2	O	1	Manipulation	C	Labeling	Domain Specific Taxonomies & Ontologies		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
279	2	O	1	Manipulation	C	Labeling	Domain Specific Taxonomies & Ontologies		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
280	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		AFRL/IF	HPKB	C. Anken	http://www.teknowledge.com/hpkb/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
281	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling	Use of confidence in analysis of information. Check for contradictions with current belief state	AFRL/IF	Enabling Tech for M & S	A. Sisti	http://www.if.afrl.af.mil/
282	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		AFRL/IF	Collaboration Enterprise Tech	B. McQuay	http://www.if.afrl.af.mil/
283	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		AFOSR		M. Just	www.ccbi.cmu.edu/workload.htm
284	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		AFOSR		M. Just	http://www.ccbi.cmu.edu/3caps.htm
285	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		DARPA/IS	C2 Programs		http://dtsn.darpa.mil/iso/
286	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		SSC-SD		D. Hardy	http://www.spawar.navy.mil/sandiego/welcome.page
287	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
288	2	O	2	Manipulation	C	Understanding	Dynamic Situation Modeling		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
289	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		AFRL/IF	Timeline Analysis System	J. Mucks	http://www.if.afrl.af.mil/
290	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		AFRL/IF	Enabling Tech for M & S	A. Sisti	http://www.if.afrl.af.mil/
291	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
292	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
293	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
294	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA/IS	C2 Programs	Garvey/Shark	http://dtsn.darpa.mil/iso/
295	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
296	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
297	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
298	2	O	2	Manipulation	C	Understanding	Sensitivity Analysis		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
299	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		Commercial	Commercial		
300	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		NRL	ATDnet	H. Dardy	http://www.nrl.navy.mil/
301	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
302	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		AFRL/IF	Information for the Warrior		http://www.if.afrl.af.mil/
303	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.	Airborne relays	AFRL/IF	UAV Airborne Switch		http://www.if.afrl.af.mil/
304	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		NRL		H. Dardy	http://www.nrl.navy.mil/
305	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
306	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.	Integrated Broadcast Service	SAF/AQIJ	IBS	LtCol R. Fullerton	http://www.safaq.hq.af.mil/restricted/aqi.html
307	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
308	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.	Global Grid	AFSC2A	Global Grid	Col Jack Fellows	
309	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		NRL	ATDnet	H. Dardy	http://www.nrl.navy.mil/
310	1	G	1	Information Access	B	Routing	Internet, ATM switching, Broadcast technologies, etc.		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
311	1	O	2	Information Access	A,B	Routing	Dynamic bandwidth management	Bandwidth management - Dynamic allocation of bandwidth on a channel to respond to changing priorities	DARPA/ISO	AICE		http://dtsn.darpa.mil/iso/
312	1	O	2	Information Access	A,B	Routing	Dynamic bandwidth management		AFRL/IF	Info for the Warrior		http://www.if.afrl.af.mil/
313	1	O	2	Information Access	A,B	Routing	Dynamic bandwidth management		NRL	STOWnets	R. Cole	http://www.nrl.navy.mil/
314	1	O	2	Information Access	A,B	Routing	Dynamic bandwidth management		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
315	3	R	3	Information Access	A	Routing	Meta-networks	Connection management - Network structure to link any information source to any sink. Agile Information Control Environment	DARPA/ISO	AICE		http://dtsn.darpa.mil/iso/
316	3	R	3	Information Access	A	Routing	Meta-networks		AFRL/IF	Survivable ATM		http://www.if.afrl.af.mil/
317	3	R	3	Information Access	A	Routing	Meta-networks		NRL	ATDnet	H. Dardy	http://www.nrl.navy.mil/
318	3	R	3	Information Access	A	Routing	Meta-networks		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
319	1	G	1	Information Access	B	Transmission	Assured delivery	Protocols to ensure information is delivered intact	Commercial			
320	1	G	1	Information Access	B	Transmission	Assured delivery		DARPA	Information Assurance Technology	S. Sadjari	http://www.darpa.mil/
321	1	G	1	Information Access	B	Transmission	Assured delivery		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
322	2	G	1	Information Access	B	Transmission	Non-repudiation		Commercial	Public Key verification		
323	2	G	1	Information Access	B	Transmission	Non-repudiation	Protocols to prove information was delivered	NRL	Network Protocols	C. Meadows	http://www.nrl.navy.mil/
324	3	R	2	Information Access	B,D	Transmission	Downstream tracking		NRL	Network Protocols	C. Meadows	http://www.nrl.navy.mil/
325	1	B	1	Information Access	E	Perception	3-D visualization		AFRL/IF		P. Jedrysik	http://www.rl.af.mil/programs/ADII/adii_main.html

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
326	1	B	1	Information Access	E	Perception	3-D visualization	3-D visual displays, including animation	NASA	3-D Flight Displays		http://olias.arc.nasa.gov/projects/human-interaction-automation/three-d-primary.html
327	1	B	1	Information Access	E	Perception	3-D visualization		NASA	Helmet-Mounted Displays		http://transit.larc.nasa.gov/tops/tops93/old/Exhibits/Ex_D-142e.4/EX_D-142e.4.html
328	1	B	1	Information Access	E	Perception	3-D visualization		NASA	See-Through Displays		http://duchamp.arc.nasa.gov/research/seethru_summary.html
329	1	B	1	Information Access	E	Perception	3-D visualization		FAA	Air Traffic Visualization		http://www.faa.gov/aua/ipt_prod/oceanic/isd.htm
330	1	B	1	Information Access	E	Perception	3-D visualization		NRL	Immersive VR	L. Rosenblum	http://www.nrl.navy.mil/
331	1	B	1	Information Access	E	Perception	3-D visualization		AFRL/HE		M. Haas	http://www.he.afrl.af.mil/
332	1	B	1	Information Access	E	Perception	3-D visualization		DARPA/IS	CPOF		http://www-code44.spawar.navy.mil/cpof/
333	1	B	1	Information Access	E	Perception	3-D visualization		AF/ESC		P. Hughes	http://www.hanscom.af.mil/
334	1	B	1	Information Access	E	Perception	3-D visualization		AFOSR		M. Just	http://www.ccbi.cmu.edu/spatial.htm
335	1	B	1	Information Access	E	Perception	3-D visualization		AFOSR		T. Poggio	http://www.ai.mit.edu/projects/cbcl/
336	1	B	1	Information Access	E	Perception	3-D visualization		AFOSR		S. Kosslyn	
337	1	B	1	Information Access	E	Perception	3-D visualization		AFOSR		S. Zucker	www.cvc.yale.edu
338	1	B	1	Information Access	E	Perception	3-D visualization		SSC-SD		M. Cowan	http://www.spawar.navy.mil/sandiego/welcome.page
339	1	B	1	Information Access	E	Perception	3-D visualization		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
340	1	B	1	Information Access	E	Perception	3-D visualization		DARPA ISO	AVS	Stephen Hennesy	http://dtsn.darpa.mil/iso/
341	1	B	1	Information Access	E	Perception	Natural language	Natural language presentations -- visual or audio	AFRL/IF	NL Generation	D. Cerino	http://www.cogentex.com/projects/
342	1	B	1	Information Access	E	Perception	Natural language		NASA	Agent Language Technology		http://groucho.gsfc.nasa.gov/hostette/agents/language/
343	1	B	1	Information Access	E	Perception	Natural language		NRL	Multimodal-Multimedia	E. Marsh	http://www.nrl.navy.mil/
344	1	B	1	Information Access	E	Perception	Natural language		AFRL/HE		T. Andersen	http://www.he.afrl.af.mil/
345	1	B	1	Information Access	E	Perception	Natural language		AFOSR		M. Just www.cbi.cmu.edu/workload.htm	http://www.ccbi.cmu.edu/language.htm
346	1	B	1	Information Access	E	Perception	Natural language		SSC-SD		B. Sundheim	http://www.spawar.navy.mil/sandiego/welcome.page
347	1	B	1	Information Access	E	Perception	Natural language		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
348	1	B	1	Information Access	E	Perception	Natural language		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
349	1	B	1	Information Access	E	Perception	Natural language		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
350	1	B	1	Information Access	E	Perception	Natural language		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
351	1	B	1	Information Access	E	Perception	Non-Traditional Senses	Olfactory, tactile etc. queuing	Commercial - entertainment			
352	1	B	1	Information Access	E	Perception	Non-Traditional Senses		AFRL/IF	Information Exploitation Technology	C. Pine	http://www.if.afrl.af.mil/
353	1	O	1	Information Access	E	Perception	Drill down	Drill-down capabilities for explaining presentations	AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
354	1	O	1	Information Access	E	Perception	Drill down		AFRL/IF		C. Burns	http://www.if.afrl.af.mil/
355	1	O	1	Information Access	E	Perception	Drill down		AFRL/IF		J. Salerno	http://www.if.afrl.af.mil/
356	1	O	1	Information Access	E	Perception	Drill down		AFRL/IF	JFACC	C. DeFranco	http://www.if.afrl.af.mil/
357	1	O	1	Information Access	E	Perception	Drill down		NSF	Human-Centered Intelligent Agents Supporting Communication and Collaboration		
358	1	O	1	Information Access	E	Perception	Drill down		AFRL/HE		M. Young	http://www.he.afrl.af.mil/
359	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
360	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
361	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	I*3	Dave Gunning	http://dtsn.darpa.mil/iso/
362	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
363	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
364	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
365	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
366	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
367	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
368	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
369	1	O	1	Information Access	E	Perception	Drill down		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
370	2	B	2	Information Access	E	Perception	3-D Audio	3-D audio displays	AFRL/HE	3D Audio		http://www.he.afrl.af.mil/
371	2	B	2	Information Access	E	Perception	3-D Audio		DARPA	Virtual Reality		http://www.darpa.mil/
372	2	B	2	Information Access	E	Perception	3-D Audio		NASA	Spatial Auditory Display		http://ctoserver.arc.nasa.gov/TechOpps/asad.html
373	2	B	2	Information Access	E	Perception	3-D Audio		NASA	Low-Vis Landing & Surface Ops		http://lava.larc.nasa.gov/ABSTRACTS/LV-1998-00011.html
374	2	B	2	Information Access	E	Perception	3-D Audio		NRL	Decision Making	J. Ballas	http://www.nrl.navy.mil/
375	2	B	2	Information Access	E	Perception	3-D Audio		AFRL/HE		R. McKinley	http://www.he.afrl.af.mil/
376	2	B	2	Information Access	E	Perception	3-D Audio		AFOSR		W. Yost	http://www.parmly.luc.edu/
377	2	B	2	Information Access	E	Perception	3-D Audio		SSC-SD		J. Kaiwi	http://www.spawar.navy.mil/sandiego/welcome.page
378	2	B	2	Information Access	E	Perception	3-D Audio		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
379	2	O	2	Information Access	E	Perception	Tailoring	Adaptation of presentations to particular users and current tasks	AFRL/IF	BROADSWORD	J. Salerno	http://www.if.afrl.af.mil/tech/programs/bsword/
380	2	O	2	Information Access	E	Perception	Tailoring		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
381	2	O	2	Information Access	E	Perception	Tailoring		AFRL/IF		P. Jedrysik	http://www.if.afrl.af.mil/
382	2	O	2	Information Access	E	Perception	Tailoring		NSF	Advanced User Interface for Network Access to Multiple Databases		http://www.nsf.gov/cgi-bin/showaward?award=8916178
383	2	O	2	Information Access	E	Perception	Tailoring		DARPA	Intelligent collaboration and visualization	Kevin Mills	http://www.darpa.mil/
384	2	O	2	Information Access	E	Perception	Tailoring		C2TIC	ELVIS		
385	2	O	2	Information Access	E	Perception	Tailoring		NRL	Multimodal-Multimedia	E. Marsh	http://www.nrl.navy.mil/
386	2	O	2	Information Access	E	Perception	Tailoring		AFRL/HE		M. Haas	
387	2	O	2	Information Access	E	Perception	Tailoring		DARPA/IS	CPOF		http://www-code44.spawar.navy.mil/cpof/
388	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
389	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
390	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
391	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
392	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
393	2	O	2	Information Access	E	Perception	Tailoring		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
394	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFRL/IF		C. Burns	http://www.if.afrl.af.mil/
395	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFRL/IF	Broadsword	J. Salerno	http://www.if.afrl.af.mil/tech/programs/bsword/
396	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
397	1	O	1	Information Access	D	User Modeling	Info.Needs Models		NASA	Cockpit Weather Information Needs		http://transit/larc.nasa.gov/tops/tops93/old/Exhibits/Ex_M-311/Ex_M-311.html
398	1	O	1	Information Access	D	User Modeling	Info.Needs Models		NASA	Crew Station Design		http:www-midas.arc.nasa.gov/documents/Corker_Smith.93.doc
399	1	O	1	Information Access	D	User Modeling	Info.Needs Models		NRL	Decision Making	J. Ballas	http://www.nrl.navy.mil/
400	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFRL/HE		M. Haas	http://www.he.afrl.af.mil/
401	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFOSR		M. Just	http://www.ccbi.cmu.edu/3caps.htm
402	1	O	1	Information Access	D	User Modeling	Info.Needs Models		AFOSR		R. Engle	http://www.gatech.edu/psychology/
403	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
404	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
405	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
406	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
407	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	Web Site Internet Address
408	1	O	1	Information Access	D	User Modeling	Info.Needs Models	Embedded understanding of information needs for situations & tasks	DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
409	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
410	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
411	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
412	1	O	1	Information Access	D	User Modeling	Info.Needs Models		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
413	1	O	1	Information Access	D	User Modeling	Dialog Management		RL	HPKB	C. Anken	http://www.teknowledge.com/hpkb/
414	1	O	1	Information Access	D	User Modeling	Dialog Management		RL	Broadsword		http://www.if.afrl.af.mil/
415	1	O	1	Information Access	D	User Modeling	Dialog Management		RL		C. DeFranco	http://www.if.afrl.af.mil/
416	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA/ITO	Communicator	A. Sears	http://www.darpa.mil/ito/research/is/index.html
417	1	O	1	Information Access	D	User Modeling	Dialog Management		NSF	Pattern-Driven User Interfaces		http://www.nsf.gov/cgi-bin/showaward?award=9123468
418	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
419	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
420	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
421	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
422	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
423	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
424	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
425	1	O	1	Information Access	D	User Modeling	Dialog Management		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
426	2	R	3	Information Access	D	User Modeling	Context Understanding	Real-time understanding of user(s)' situation & tasks at hand	AFRL/IF	Enhanced All Source Fusion	M. Hinman	http://www.if.afrl.af.mil/
427	2	R	3	Information Access	D	User Modeling	Context Understanding		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
428	2	R	3	Information Access	D	User Modeling	Context Understanding		AFRL/HE		G. Reid	http://www.he.afrl.af.mil/
429	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA/IS	CPOF		http://www-code44.spawar.navy.mil/cpof/
430	2	R	3	Information Access	D	User Modeling	Context Understanding		AFOSR		T. Poggio	http://www.ai.mit.edu/projects/cbcl/
431	2	R	3	Information Access	D	User Modeling	Context Understanding		AFOSR		J. Wolfe	www.wolfelab.bwh.harvard.edu
432	2	R	3	Information Access	D	User Modeling	Context Understanding		AFOSR		N. Cooke	http://www-psych.nmsu.edu/nancypg.html
433	2	R	3	Information Access	D	User Modeling	Context Understanding		AFOSR		R. Engle	http://www.gatech.edu/psychology/
434	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/
435	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
436	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	DDB	Tom Burns	http://dtsn.darpa.mil/iso/
437	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
438	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
439	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
440	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
441	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
442	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
443	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
444	2	R	3	Information Access	D	User Modeling	Context Understanding		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
445	2	R	3	Information Access	D	User Modeling	Intent Inferencing	Real-time understanding of user(s)' goals, plans, & preferences	AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
446	2	R	3	Information Access	D	User Modeling	Intent Inferencing		AFRL/IF	Joint Targeting Toolkit	J. Palermo	http://www.if.afrl.af.mil/
447	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
448	2	R	3	Information Access	D	User Modeling	Intent Inferencing		NSF	Multitext Fusion, Tracking and Trend Detection		http://www.nsf.gov/cgi-bin/showaward?award=9314992
449	2	R	3	Information Access	D	User Modeling	Intent Inferencing		AFOSR		A. Gevins	
450	2	R	3	Information Access	D	User Modeling	Intent Inferencing		AFOSR		N. Cooke	http://www-psych.nmsu.edu/nancypg.html
451	2	R	3	Information Access	D	User Modeling	Intent Inferencing		AFOSR		R. Engle	http://www.gatech.edu/psychology/
452	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	BADD	Robert Beaton	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
453	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
454	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
455	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
456	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
457	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
458	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
459	2	R	3	Information Access	D	User Modeling	Intent Inferencing		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
460	1	G	1	Information Access	A	Protection	Encryption		Commercial			
461	1	G	1	Information Access	A	Protection	Encryption		AFRL/IF	Secure Handling of Information		http://www.if.afrl.af.mil/
462	1	G	1	Information Access	A	Protection	Encryption	Encryption tools compatible with route & transmit configurations	AFRL/IF	Speakeasy (programmable encryption)		http://www.if.afrl.af.mil/
463	1	G	1	Information Access	A	Protection	Encryption		DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
464	1	G	1	Information Access	A	Protection	Encryption		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
465	1	O	1	Information Access	A	Protection	Recall of inaccurate information		AFRL/IF	Broadsword AFRL/IF		http://www.if.afrl.af.mil/tech/programs/bsword/
466	1	O	1	Information Access	A	Protection	Recall of inaccurate information	Ability to chase down erroneous info and retract it from all users who exploited it	DARPA ISO	IA	Sami Sadjari	http://dtsn.darpa.mil/iso/
467	1	O	1	Information Access	A	Protection	Recall of inaccurate information		DARPA ITO	IS	Teresa Lunt	http://www.darpa.mil/ito/research/is/index.html
468	1	O	1	Information Access	D,E	Communication	Conversational Query		AFRL/IF	Broadsword	J. Salerno	http://www.if.afrl.af.mil/tech/programs/bsword/
469	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA/ISO	I3, JLACTD, TRIPS	Dave Gunning	http://dtsn.darpa.mil/iso/
470	1	O	1	Information Access	D,E	Communication	Conversational Query		NSF	Visual Query Languages for Database Systems		http://www.nsf.gov/cgi-bin/showaward?award=9896052
471	1	O	1	Information Access	D,E	Communication	Conversational Query		AFRL/HE		T. Andersen	http://www.he.afrl.af.mil/
472	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
473	1	O	1	Information Access	D,E	Communication	Conversational Query	User expressions of information needs and possibly desired sources	DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
474	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
475	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
476	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
477	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
478	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
479	1	O	1	Information Access	D,E	Communication	Conversational Query		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
480	1	G	2	Information Access	E	Communication	Speech		AFRL/IF	Audio Processing	J. Cupples	http://www.if.afrl.af.mil/
481	1	G	2	Information Access	E	Communication	Speech		NASA	Data Entry Device		http://pyroeis.arc.nasa.gov/SSBRP/Glovebxdataentry.html
482	1	G	2	Information Access	E	Communication	Speech		FAA	Impact of Speech Dysfluencies		http://www.faa.gov/avr/AAM/FASB597/37.htm
483	1	G	2	Information Access	E	Communication	Speech	Translations of vocalized expressions	AFRL/HE		D. Williamson	http://www.he.afrl.af.mil/
484	1	G	2	Information Access	E	Communication	Speech		DARPA/IT	Communicator	A. Sears	http://www.darpa.mil/ito/research/is/index.html
485	1	G	2	Information Access	E	Communication	Speech		SSC-SD		G. Dean	http://www.spawar.navy.mil/sandiego/welcome.page
486	1	G	2	Information Access	E	Communication	Speech		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
487	1	G	2	Information Access	E	Communication	Speech		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
488	1	O	2	Information Access	E	Communication	Natural language		AFRL/IF	HPKB	C. Anken	http://www.teknowledge.com/hpkb/
489	1	O	2	Information Access	E	Communication	Natural language		AFRL/IF	Information Exploitation Technology	C. Pine	http://www.if.afrl.af.mil/
490	1	O	2	Information Access	E	Communication	Natural language		AFRL/IF		J. Smith	http://www.if.afrl.af.mil/
491	1	O	2	Information Access	E	Communication	Natural language		DARPA/ITO	HLS	A. Sears	http://www.darpa.mil/ito/research/is/index.html
492	1	O	2	Information Access	E	Communication	Natural language	Translations of natural language expressions	NSF	Interactive Processes of Language use in Human-Computer Interfaces		http://www.nsf.gov/cgi-bin/showaward?award=9202458
493	1	O	2	Information Access	E	Communication	Natural language		AFRL/HE		T. Andersen	

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
494	1	O	2	Information Access	E	Communication	Natural language		DARPA/IT	Communicator	A. Sears	http://www.darpa.mil/ito/research/is/index.html
495	1	O	2	Information Access	E	Communication	Natural language		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
496	1	O	2	Information Access	E	Communication	Natural language		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
497	1	O	2	Information Access	E	Communication	Natural language		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
498	1	O	2	Information Access	E	Communication	Natural language		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
499	2	B	2	Information Access	E	Communication	Annotation	Attachment of explanations & caveats to expressions by users & others	NSF	Speech Generation for Human-Computer Interaction		http://www.nsf.gov/cgi-bin/showaward?award=9528990
500	2	B	2	Information Access	E	Communication	Annotation		AFRL/HE		T. Andersen	http://www.he.afrl.af.mil/
501	2	B	2	Information Access	E	Communication	Annotation		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
502	2	O	3	Information Access	E	Communication	Domain Specific Gesturing	Translations of gestural expressions	AFRL/IF			http://www.if.afrl.af.mil/
503	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		DARPA/ITO	Communicator	A. Sears	http://www.darpa.mil/ito/research/is/index.html
504	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		NSF	A Unified Framework for Multimodal Conversational Behaviors in Interactive Humanoid Agents		http://www.nsf.gov/cgi-bin/showaward?award=9618939
505	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		NSF	A Gesture Interpretation and Voice Recognition Multi-Modal Human Machine Interface		http://www.nsf.gov/cgi-bin/showaward?award=9113787
506	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		NASA	Virtual Spacetime		http://science.nas.nasa.gov/Pubs/TechReports/RNRreports/sbryson/RNR-92-009/RNR-spacetime.html
507	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		AFRL/HE		G. McMillan	
508	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		DARPA/IS	CPOF		http://www-code44.spawar.navy.mil/cpof/
509	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		AFOSR		T. Poggio	http://www.ai.mit.edu/projects/cbcl/
510	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		AFOSR		S. Zucker	http://www.cvc.yale.edu/
511	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		SSC-SD		G. Osaga	http://www.spawar.navy.mil/sandiego/welcome.page
512	2	O	3	Information Access	E	Communication	Domain Specific Gesturing		DARPA ISO	TVRS	Allen Sears	http://dtsn.darpa.mil/iso/
513	1	G	1	Information Access	D,E	Collaboration	Sharing	Interaction via shared representations of information	AFRL/IF	EDCS	C. Burns	http://www.if.afrl.af.mil/
514	1	G	1	Information Access	D,E	Collaboration	Sharing		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
515	1	G	1	Information Access	D,E	Collaboration	Sharing		AFRL/IF	Virtual Environments	A. Sisti	http://www.if.afrl.af.mil/
516	1	G	1	Information Access	D,E	Collaboration	Sharing		RL	AFRL Collaborative Enterprise Technology	B. McQuay	http://www.if.afrl.af.mil/
517	1	G	1	Information Access	D,E	Collaboration	Sharing		NASA	The Bluecoat Project		http://olias.arc.nasa.gov/projects/bluecoat-digest/bluecoat.html
518	1	G	1	Information Access	D,E	Collaboration	Sharing		NASA	Team Decision Making		http://olias.arc.nasa.gov/projects/distr-team-decisions/cockpit-team-decision.html
519	1	G	1	Information Access	D,E	Collaboration	Sharing		SPAWAR	Project IRUS		http://www.spawar.navy.mil/sandiego/welcome.page
520	1	G	1	Information Access	D,E	Collaboration	Sharing		AFRL/HE		M. Haas	http://www.he.afrl.af.mil/
521	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA/IS	C2 Programs		http://dtsn.darpa.mil/iso/
522	1	G	1	Information Access	D,E	Collaboration	Sharing		SSC-SD		L. Duffy	http://www.spawar.navy.mil/sandiego/welcome.page
523	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
524	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
525	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
526	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
527	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	Web Site Internet Address
528	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
529	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
530	1	G	1	Information Access	D,E	Collaboration	Sharing		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
531	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding	Creation and sharing explanations & summarizations of information	AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
532	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		AFRL/IF		A. Sisti	http://www.if.afrl.af.mil/
533	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		AFRL/IF		B. McQuay	http://www.if.afrl.af.mil/
534	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA/IT	CI&V	K. Mills	http://www.darpa.mil/ito/research/is/index.html
535	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
536	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
537	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
538	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
539	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
540	1	B	1	Information Access	E	Collaboration	Advanced Whiteboarding		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
541	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management	Mgt. Of allocation of tasks, information, & decisions among participants	AFRL/IF	ARPI	R. Metzger	http://arpi.isx.com/
542	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
543	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		AFRL/IF	Virtual Environments	A. Sisti	http://www.if.afrl.af.mil/
544	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		AFRL/IF		B. McQuay	http://www.if.afrl.af.mil/
545	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		AFOSR		M. Just	http://www.ccbi.cmu.edu/workload.htm
546	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		SSC-SD		J. Clarkson	http://www.spawar.navy.mil/sandiego/welcome.page
547	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
548	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
549	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
550	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
551	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
552	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
553	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
554	2	O	1	Information Access	D	Collaboration	Domain-specific Workflow Management		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
555	2	O	1	Information Access	D	Collaboration	Mixed Initiatives	Human/machine partnership in problem solving	DARPA/ISO	TRIPS	Doug Dyer	http://dtsn.darpa.mil/iso/
556	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
557	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	DMIF	Stephen Flank	http://dtsn.darpa.mil/iso/
558	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	COABS	Doug Dyer	http://dtsn.darpa.mil/iso/
559	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	ALP	Todd Carrico	http://dtsn.darpa.mil/iso/
560	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	AIM	Carol Thompson	http://dtsn.darpa.mil/iso/
561	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	SAIP	Stephen Welby	http://dtsn.darpa.mil/iso/
562	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	MSTAR	Robert Hummel	http://dtsn.darpa.mil/iso/
563	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA STO	MTE	Bruce Johnson	http://www.darpa.mil/
564	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	DDB		http://dtsn.darpa.mil/iso/
565	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
566	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
567	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	HPKB	Dave Gunning	http://dtsn.darpa.mil/iso/
568	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	PDA	Doug Dyer	http://dtsn.darpa.mil/iso/
569	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
570	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html
571	2	O	1	Information Access	D	Collaboration	Mixed Initiatives		DARPA ISO	COAA	Dell Lunceford	http://dtsn.darpa.mil/iso/
572	2	B	3	Information Access	D	Collaboration	Facilitation		AFRL/IF		C. Burns	http://www.if.afrl.af.mil/
573	2	B	3	Information Access	D	Collaboration	Facilitation		AFRL/IF		C. DeFranco	http://www.if.afrl.af.mil/
574	2	B	3	Information Access	D	Collaboration	Facilitation		AFRL/IF	Virtual Environments	A. Sisti	http://www.if.afrl.af.mil/
575	2	B	3	Information Access	D	Collaboration	Facilitation		AFRL/IF		B. McQuay	http://www.if.afrl.af.mil/

	P	M	E	Technologies	C	Technology Area	Specific Technology	Definition/Explanation	Organization	Research Programs	Program Manager	*Web Site Internet Address*
576	2	B	3	Information Access	D	Collaboration	Facilitation	Support of group processes for discussion, decision making, etc.	NSF	Group Decision Making and Group Decision Support Systems		http://www.nsf.gov/cgi-bin/showaward?award=8715565
577	2	B	3	Information Access	D	Collaboration	Facilitation		AFRL/HE		M. Haas	http://www.he.afrl.af.mil/
578	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA/IT	CI&V	K. Mills	http://www.darpa.mil/ito/research/is/index.html
579	2	B	3	Information Access	D	Collaboration	Facilitation		SSC-SD		L. Duffy	http://www.spawar.navy.mil/sandiego/welcome.page
580	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA ISO	JTF-ATD	Ref Dellgado	http://dtsn.darpa.mil/iso/
581	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA ISO	GENOA	Brian Sharkey	http://dtsn.darpa.mil/iso/
582	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA ISO	CPOF	Dave Gunning	http://www-code44.spawar.navy.mil/cpof/
583	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA ISO	JFACC	Daniel McCrory	http://dtsn.darpa.mil/iso/
584	2	B	3	Information Access	D	Collaboration	Facilitation		DARPA ITO	EDCS	John Salasin	http://www.darpa.mil/ito/research/is/index.html