

Headquarters U.S. Air Force

Integrating Technology to the Joint Fight



Lt Gen Tom Hobbins
Deputy Chief of Staff
Warfighting Integration

U.S. AIR FORCE

January 2004



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Taking Action

The Air Force is engaged in Jointly developing advanced technologies and integrating net-centric warfare by significant investment in resources and people to deliver capability to the Joint Commander.



Requires:

- **Persistent sensors and weapons effects.**
- **Integrating nodes through digital connectivity.**
- **Enabling capability through advanced applications**



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Net-Enabled Capabilities Improve Effects

OBJECTIVE:

Shorten the Kill Chain

Achieve

EFFECTS:

**Decision Superiority
Greater Speed
Greater Precision**

Need

CAPABILITIES:

**Global Network Connectivity
Network-Enabled Platforms/Weapons
Fused Intel
Real Time C2 and SA**

Key: Net-Centric Operations

IP-based routing, shared data, assured service



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Joint Mission Area Capability

Attack Operations

Global Strike
Interdiction

TST/TCT
Prosecution

Special
Operations

Offensive
Counter-air

SEAD/DEAD

Close Air Support

Information
Operations

Combat Support Operations

Defensive Operations

National Ballistic
Missile Defense

Homeland Defense

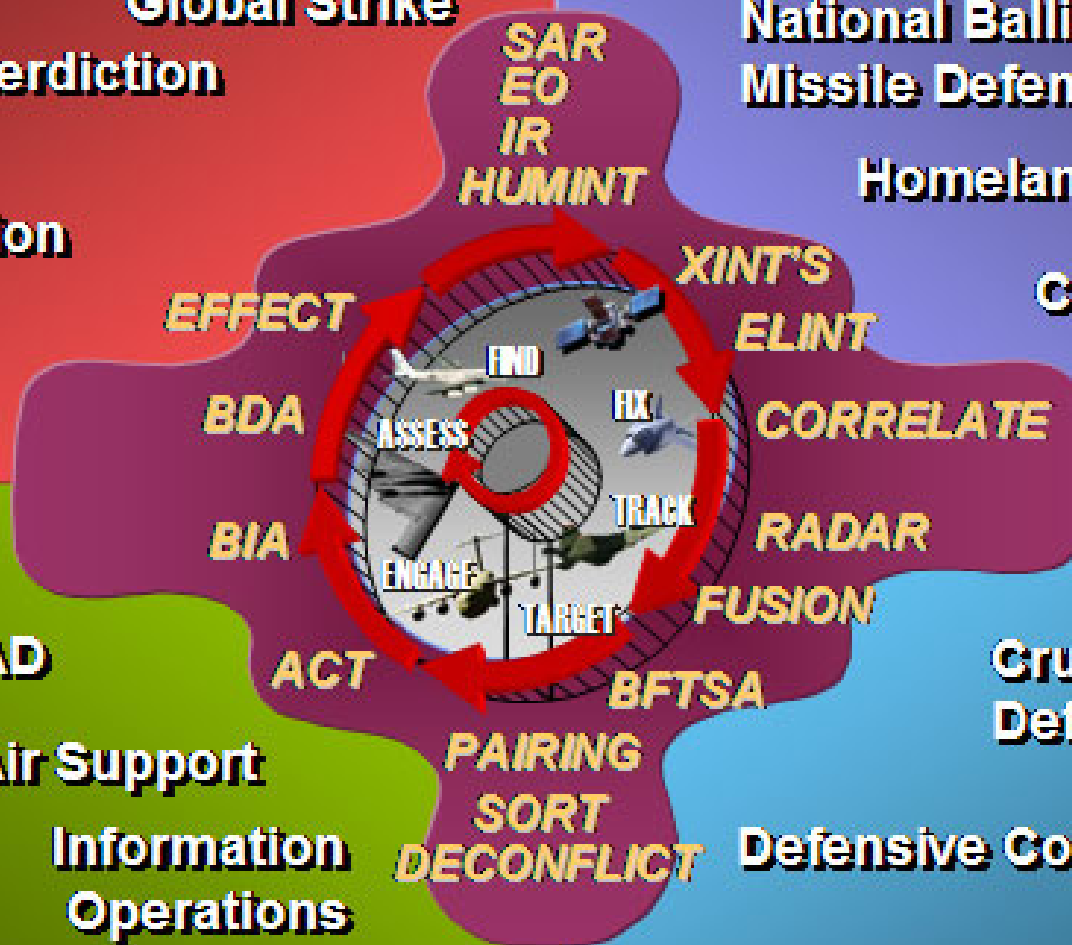
Counter Space

Theater
Missile
Defense

Cruise Missile
Defense

Defensive Counter Air

Air Defense Operations

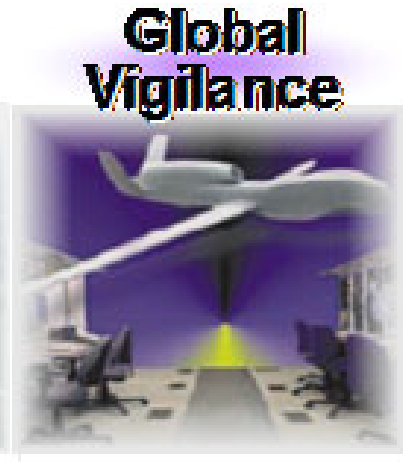
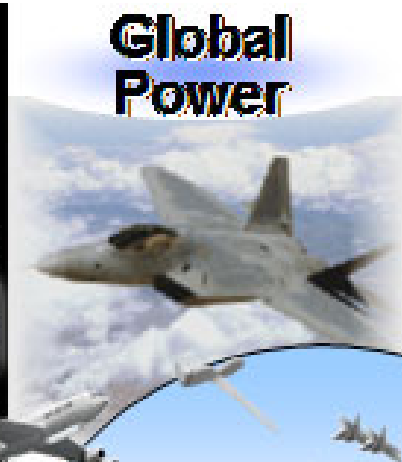
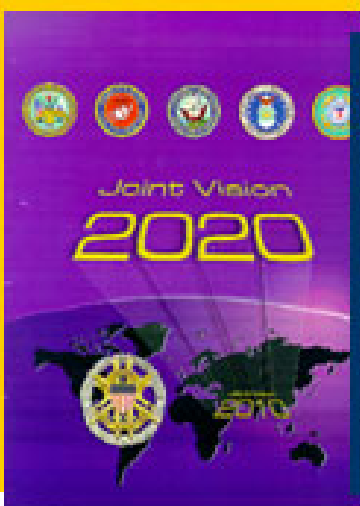


Integration Critical to Improving All Missions



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Capabilities-Based CONOPS



Integration CONOPS

**Global Strike
CONOPS**

**Homeland
Security
CONOPS**

**Global
Mobility
CONOPS**

**Global
Persistent Attack
CONOPS**

**Nuclear
Response
CONOPS**

**Space &
CAISR
CONOPS**



Space & C4ISR CONOPS Effects

From CONOPS

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Seamless C3 for all distances and levels of command



**Connectivity /
Interoperability /
Access**

Provide timely, actionable information



**Low latency –
High accuracy**

Enable distributed dynamic battle management, planning, control, de-confliction and execution.



**Blue Force
Situational
Awareness**

Respond rapidly to emerging targets & events to create decisive effects



**Swarming via
digital networking**

Deter or dissuade by detecting, tracking and identifying all targets - the foundation to execute tasking



**Red Force
Situational
Awareness**

SPACE & C4ISR
CAPABILITIES
CONOPS

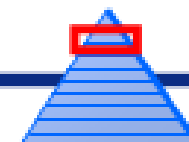


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29 September 2003
(Version 1.0)

CY03 FINAL

Puts CONOPS in Operator and Acquisition Language





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C4ISR Summit 2003 Panel Link to Space & C4ISR CONOPs Capabilities

WHY FOCUS ON NetOps?

Summit Panels

EBO

PBA

Net
Ops

1.0 Locate, ID, track, observe

X

X

2.0 Deploy and employ ISR assets

X

X

X

3.0 Assess Global Conditions and Events

X

X

4.0 Battlespace Situation Awareness

X

X

X

5.0 Dynamic Battle Management

X

X

X

6.0 Exercise S&C4ISR Capabilities

X

X

7.0 Deceive or defeat ISR capabilities

X

X

8.0 Attack and defend in the infosphere

X

X

9.0 Perform counterspace

X

10.0 Right information to right decision-maker, at right time

X

X

11.0 Operate, Protect and Defend Info and Info Systems

X

12.0 Generate & provide supporting info services

X

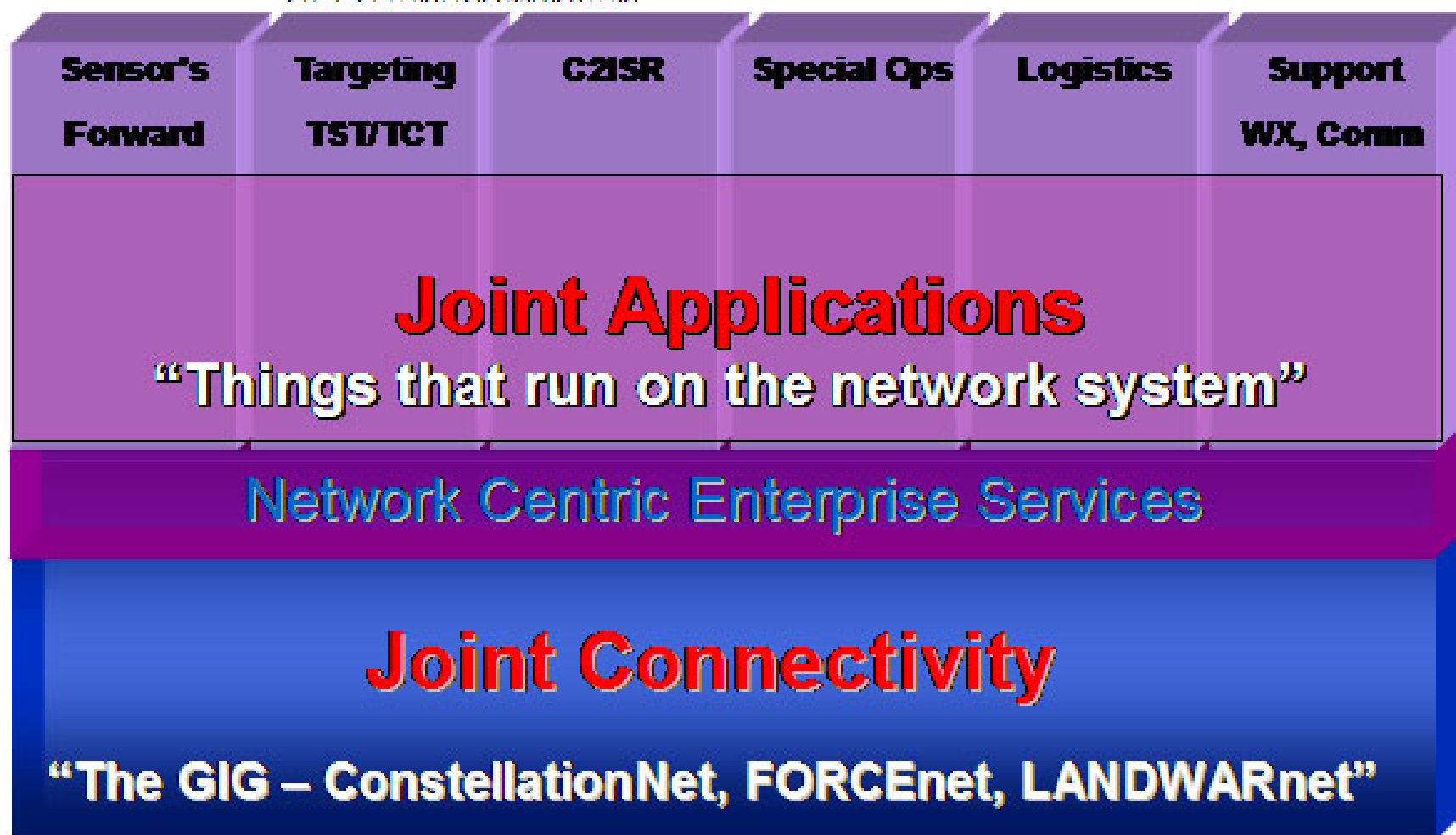
*Source: 7 Oct 02 Final Version S&C4ISR CONOPS



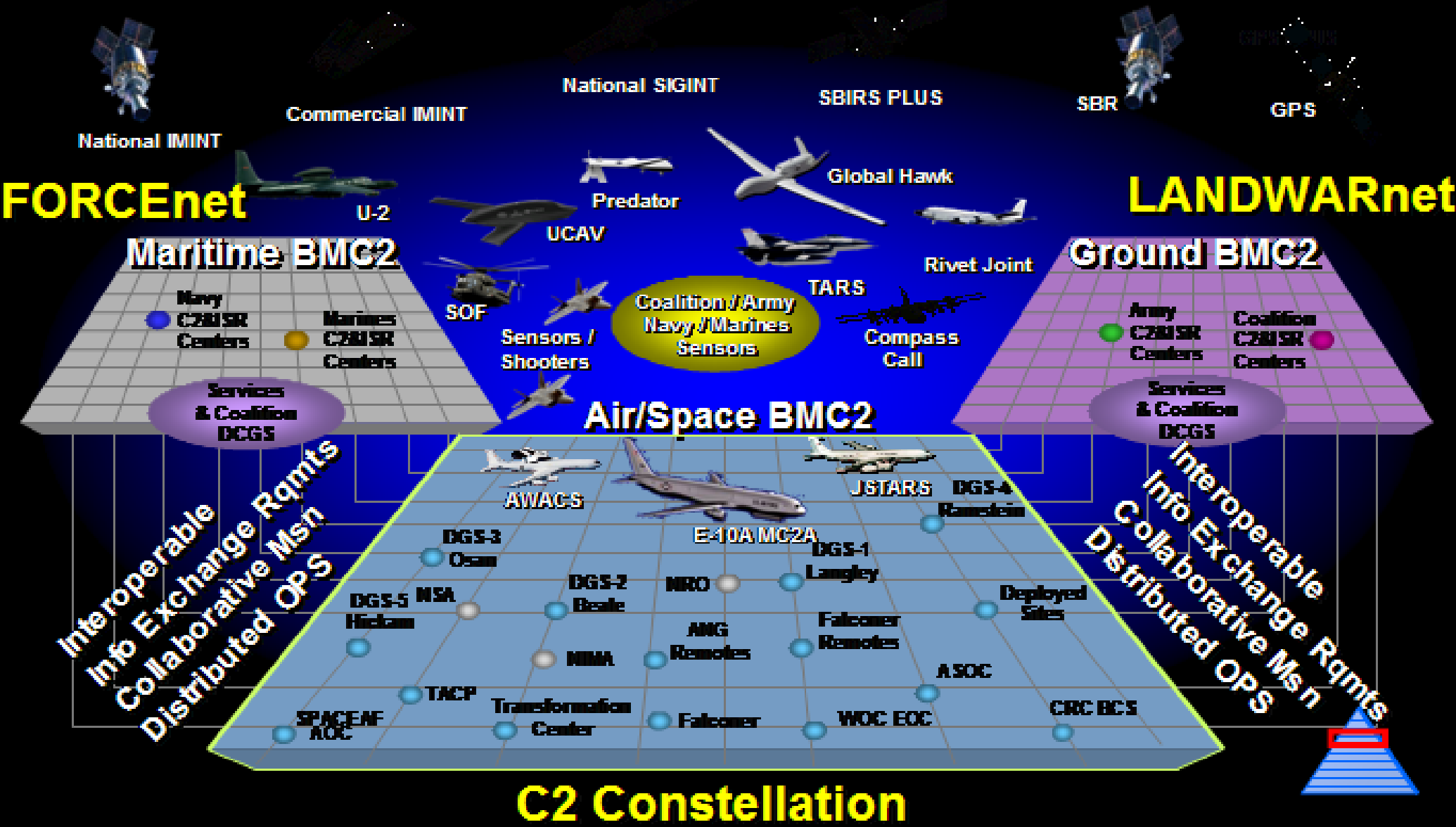
NetOPs Core Components

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© 2004 Constellation



Constellation Interoperates with Maritime & Ground BMC2 Systems to Provide Joint BMC2





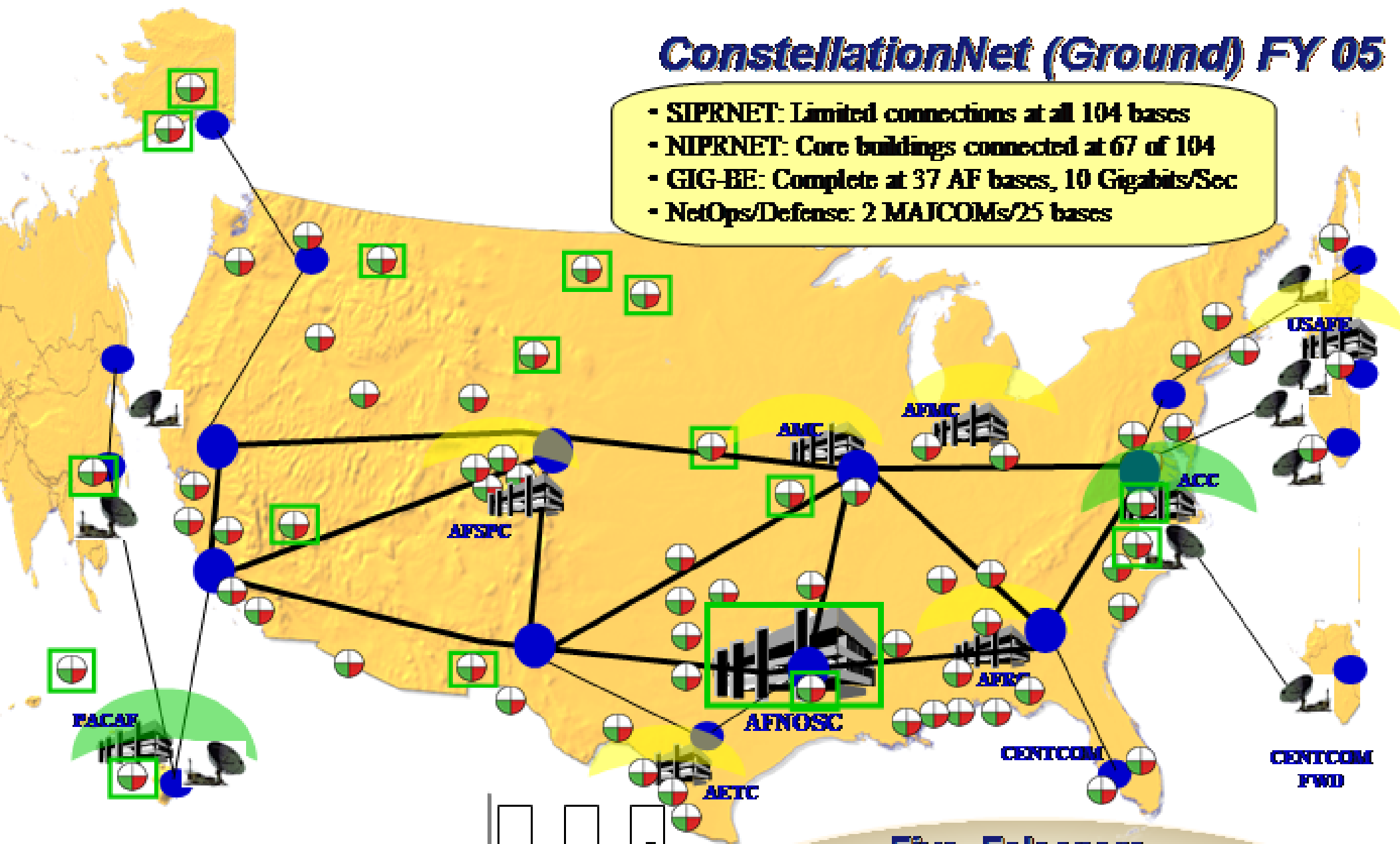
Constellation Net (Ground) C2 and Intel Connectivity






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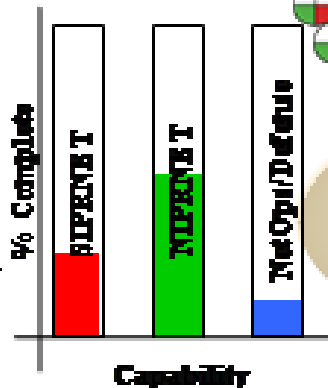


ConstellationNet (Ground) FY 05

- SIPRNET: Limited connections at all 104 bases
- NIPRNET: Core buildings connected at 67 of 104
- GIG-BE: Complete at 37 AF bases, 10 Gigabits/Sec
- NetOps/Defense: 2 MAJCOMs/25 bases

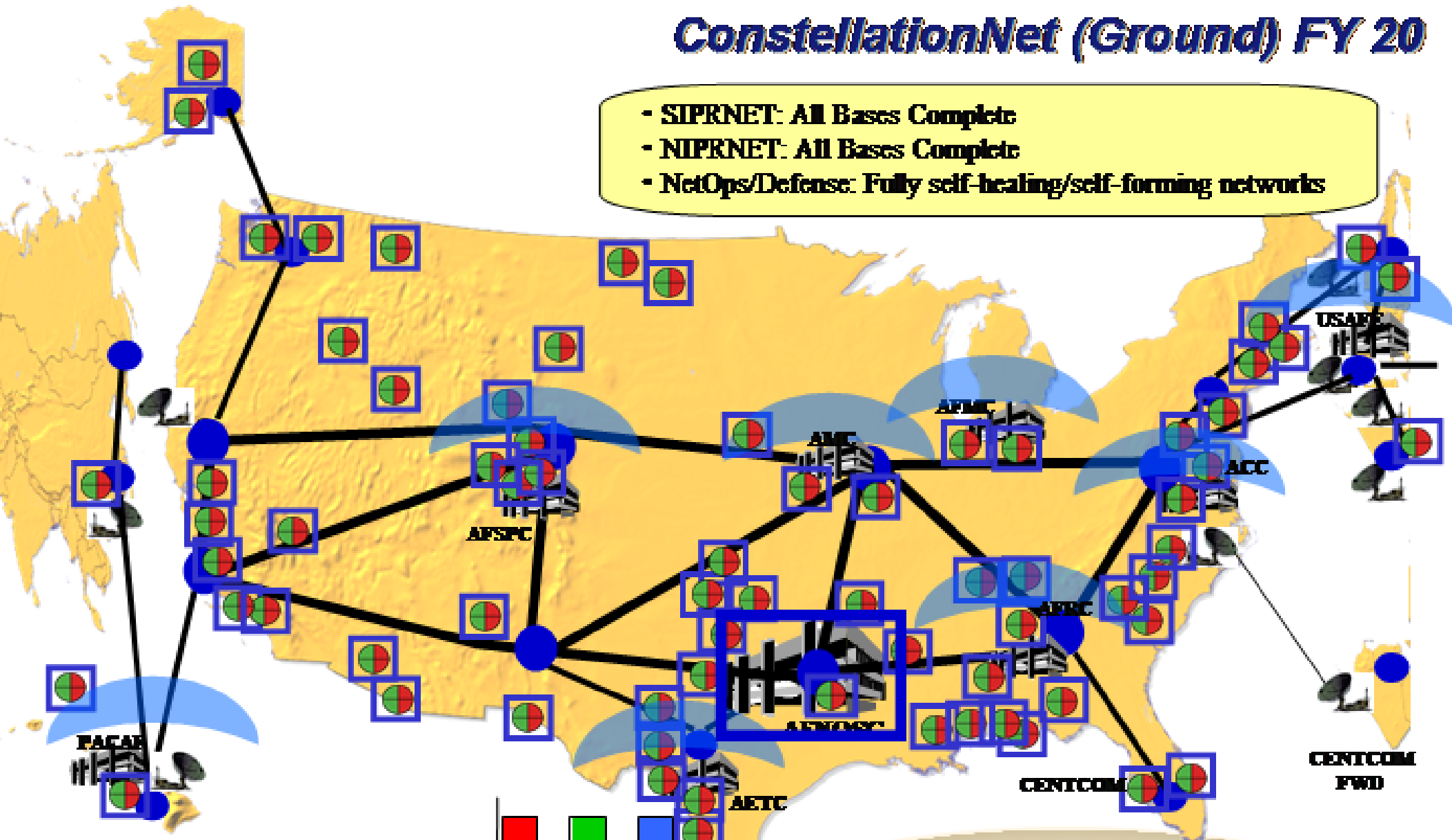



-  NIPRNET
  Centralized NetOps/Defense
-  SIPRNET
  Limited Centralized NetOps/Defense
-  GIG-BE Installed




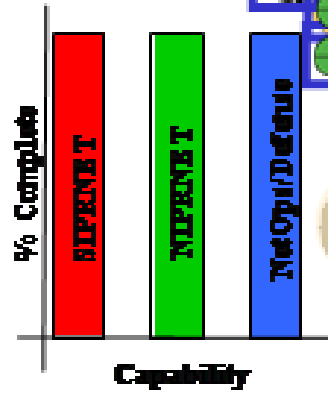
ConstellationNet (Ground) FY 20

- SIPRNET: All Bases Complete
- NIPRNET: All Bases Complete
- NetOps/Defense: Fully self-healing/self-forming networks



 Smart Networks: Self-Forming, Self-Optimizing Nets Allowing Seamless Access to Information World-Wide

 Self-Healing Nets Increasing Survivability, Availability and Access to the Net; Integrated NetCOP

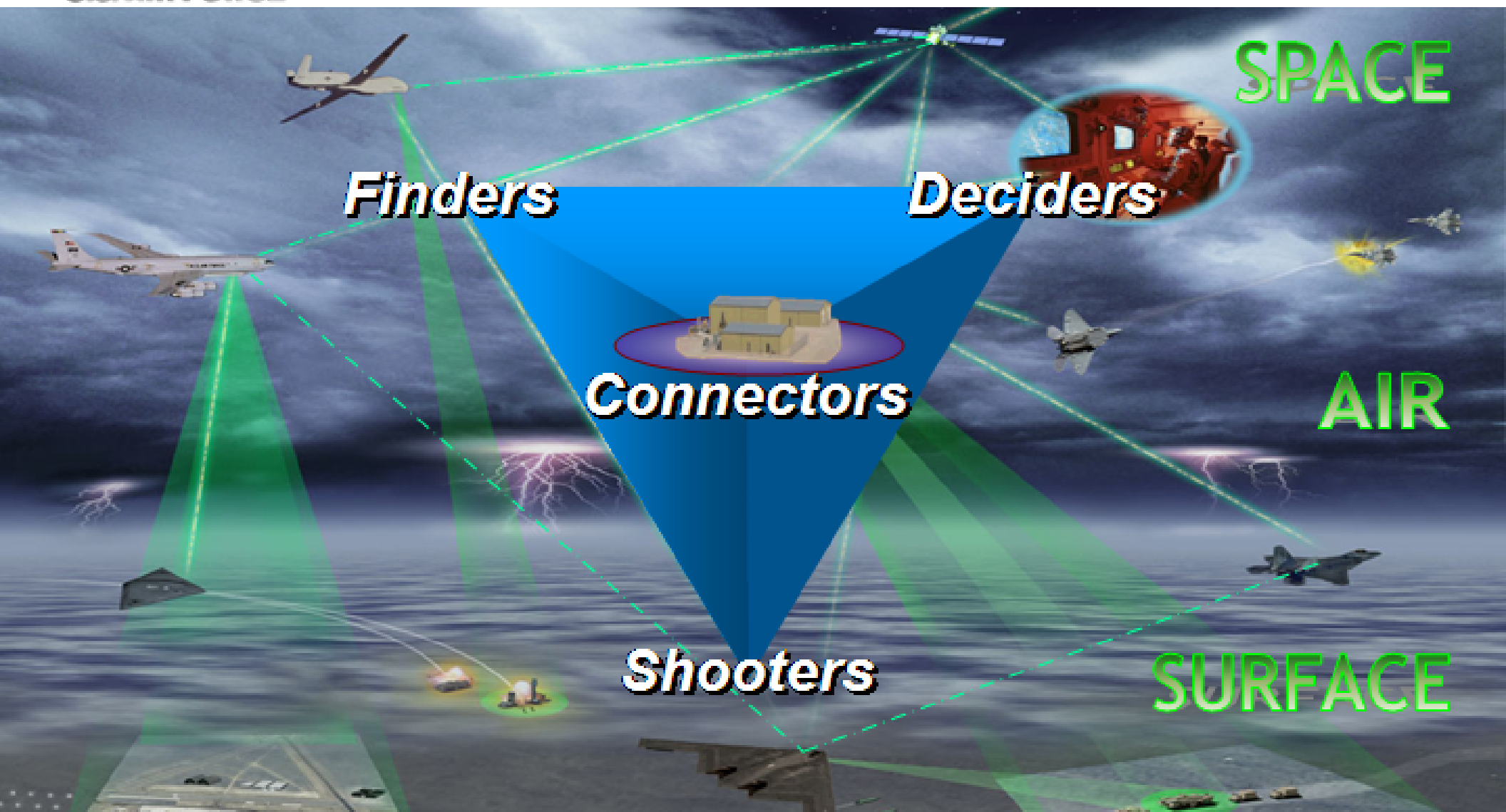




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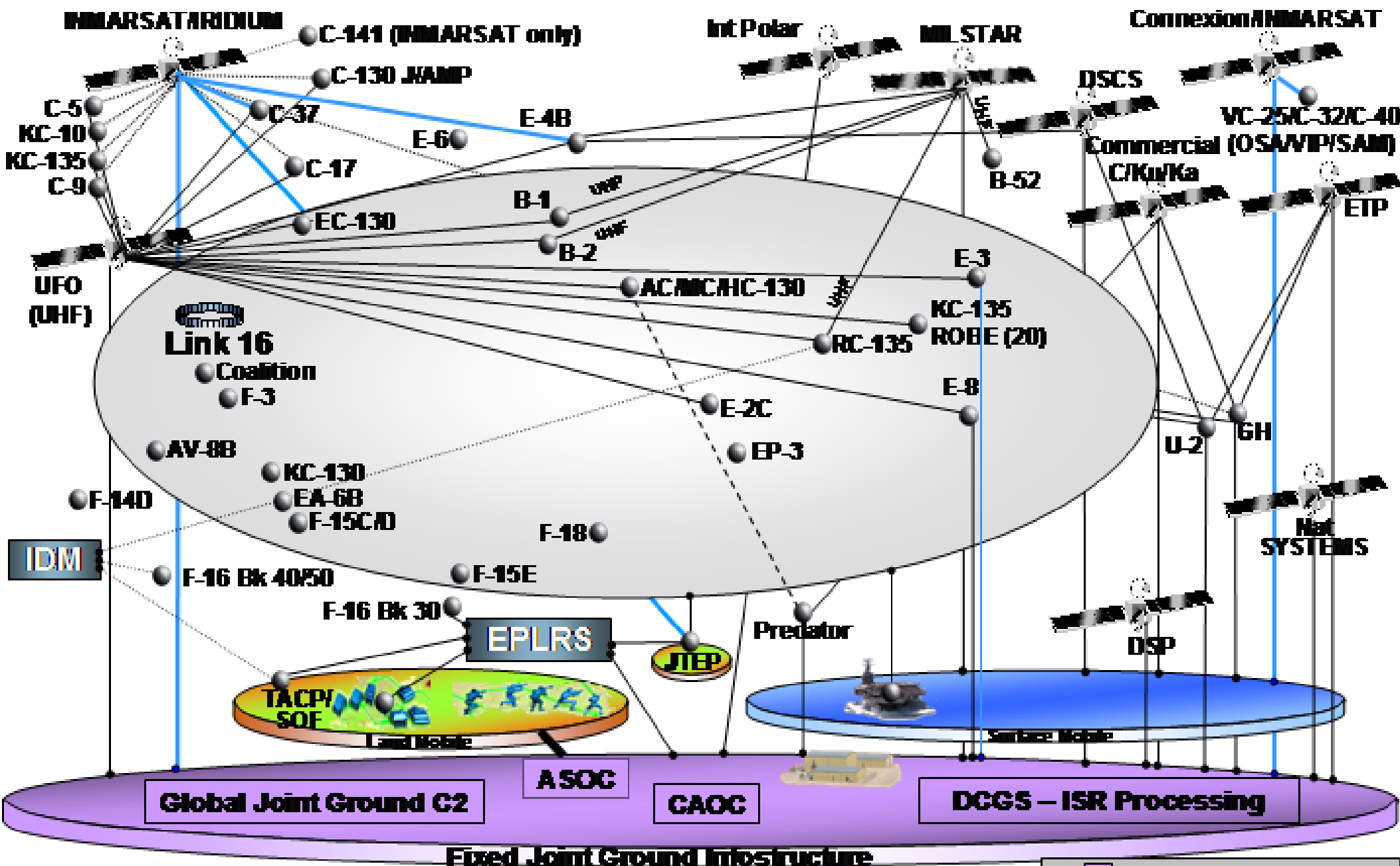
Mobile Node Connectivity

"The Last Tactical Mile"



Time sensitive targets must be shared, distributed, and integrated horizontally ... to one and all simultaneously

Funded FY 05 Constellation Net (Air & Space)

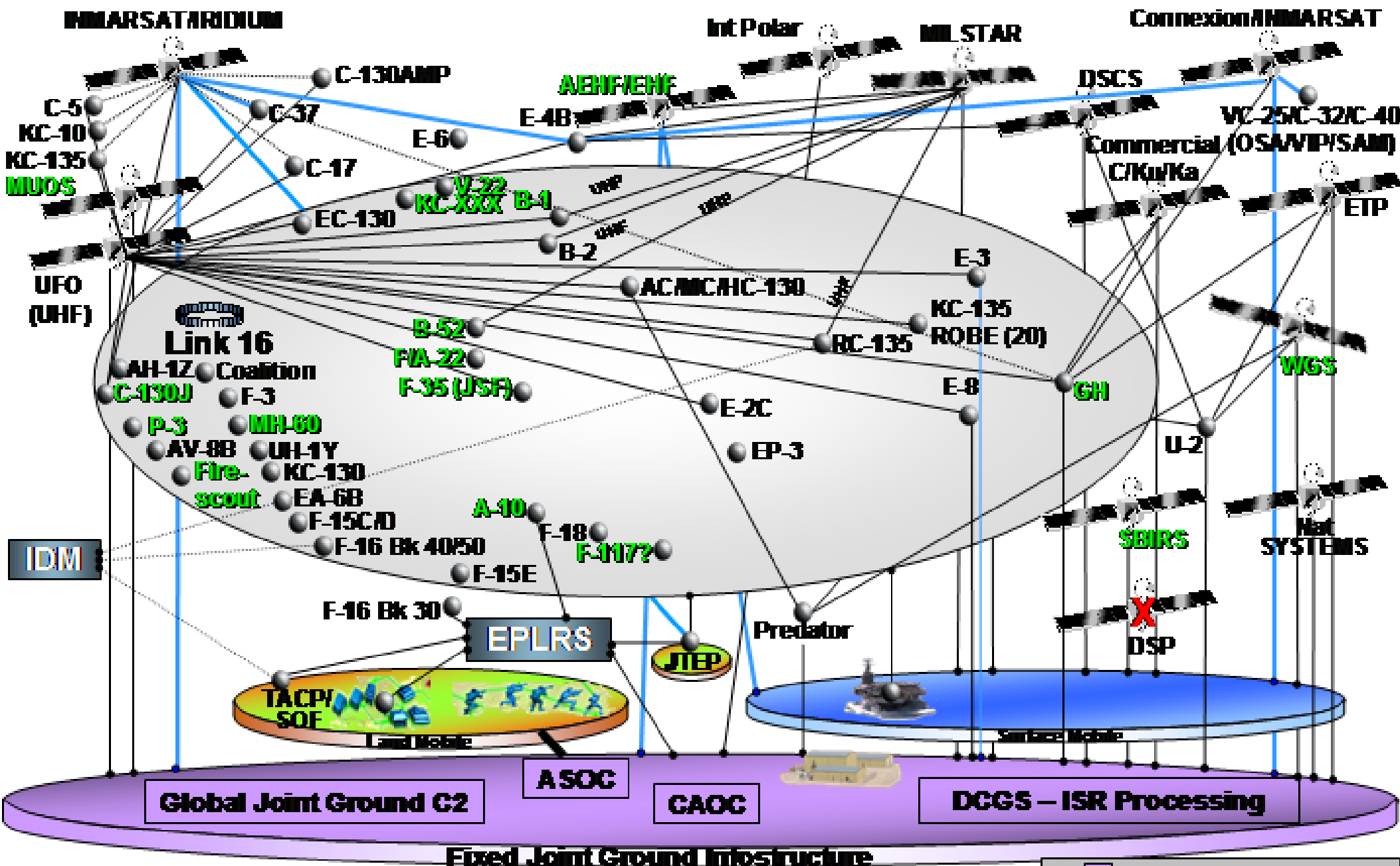


No Significant IP or Data Link Capability:
 A-10 B-1 (58) B-52 C-5 C-9 C-17 C-130 JAMP C-141 KC-10
 F-117 HH-60 KC-135 HH-60H P-3(L11) UH-1Y AH-1Z F-14 MH-60

Future platforms: F-22 F-35
 E-10 ABL UCAV CV-22 KC-30A
 MMA BAMS UAV ACS V-22

= IP Dynamic Routing
 = IP Data
X = Decommissioned
Green Text = Added Capability

Funded FY 09 Constellation Net (Air & Space)

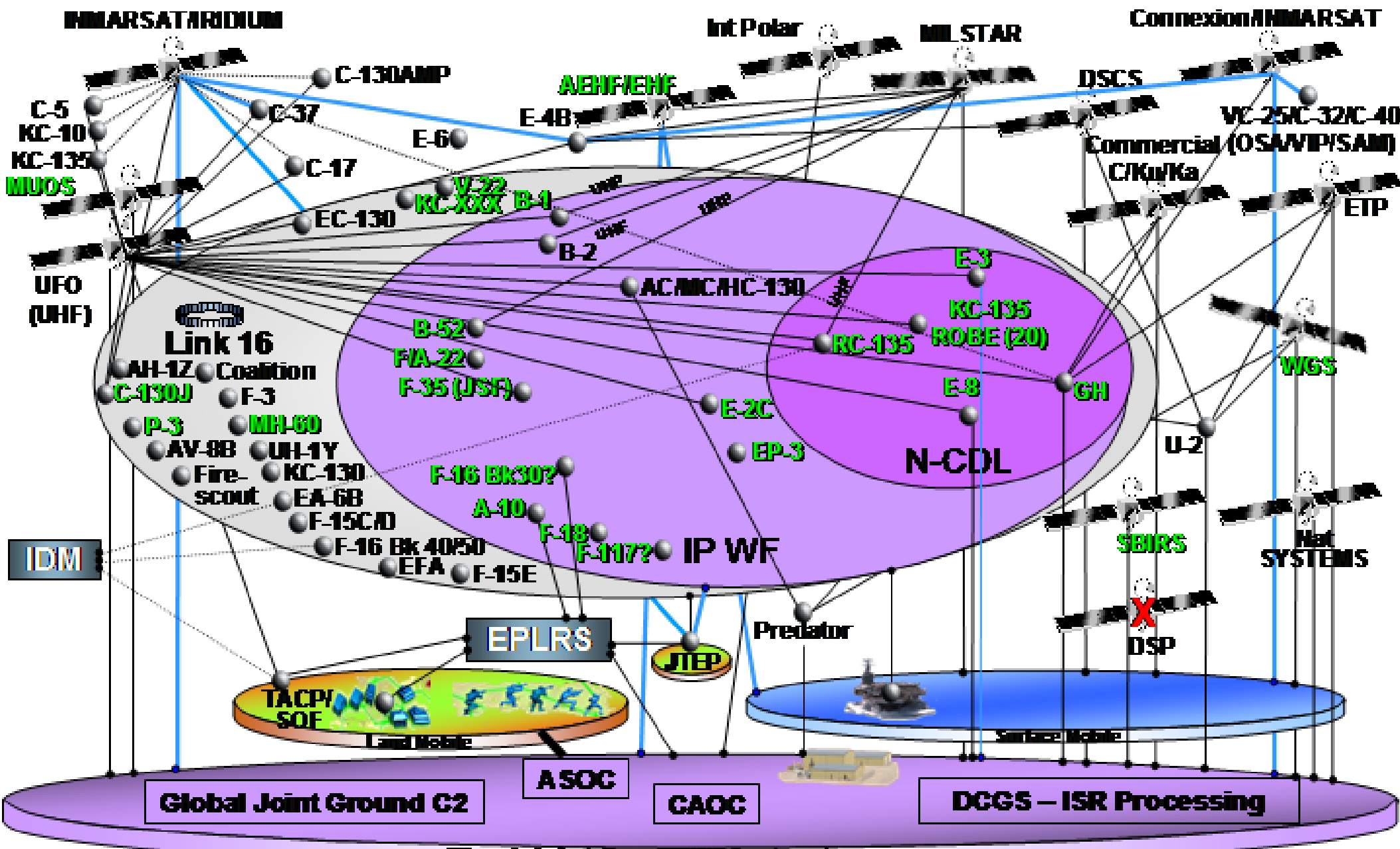


No Significant IP or Data Link Capability:
 C-5 C-130AMP C-17 HH-60 KC-10 KC-135
 MH-60 E-6 C-40 A1P MH-53E
 SH-60 HH-60H P-3(L11) UH-1Y AH-1Z

Future platforms: E-10 ABL UCAV CV-22 MMA
 BAMS UAV ACS
More Aircraft connected via Link 16
Forwarding/gateway via ROBE, JTEP

= IP Dynamic Routing
 = IP Data
X = Decommissioned
X = Added Capability

Envisioned FY 09 Constellation Net (Air & Space)

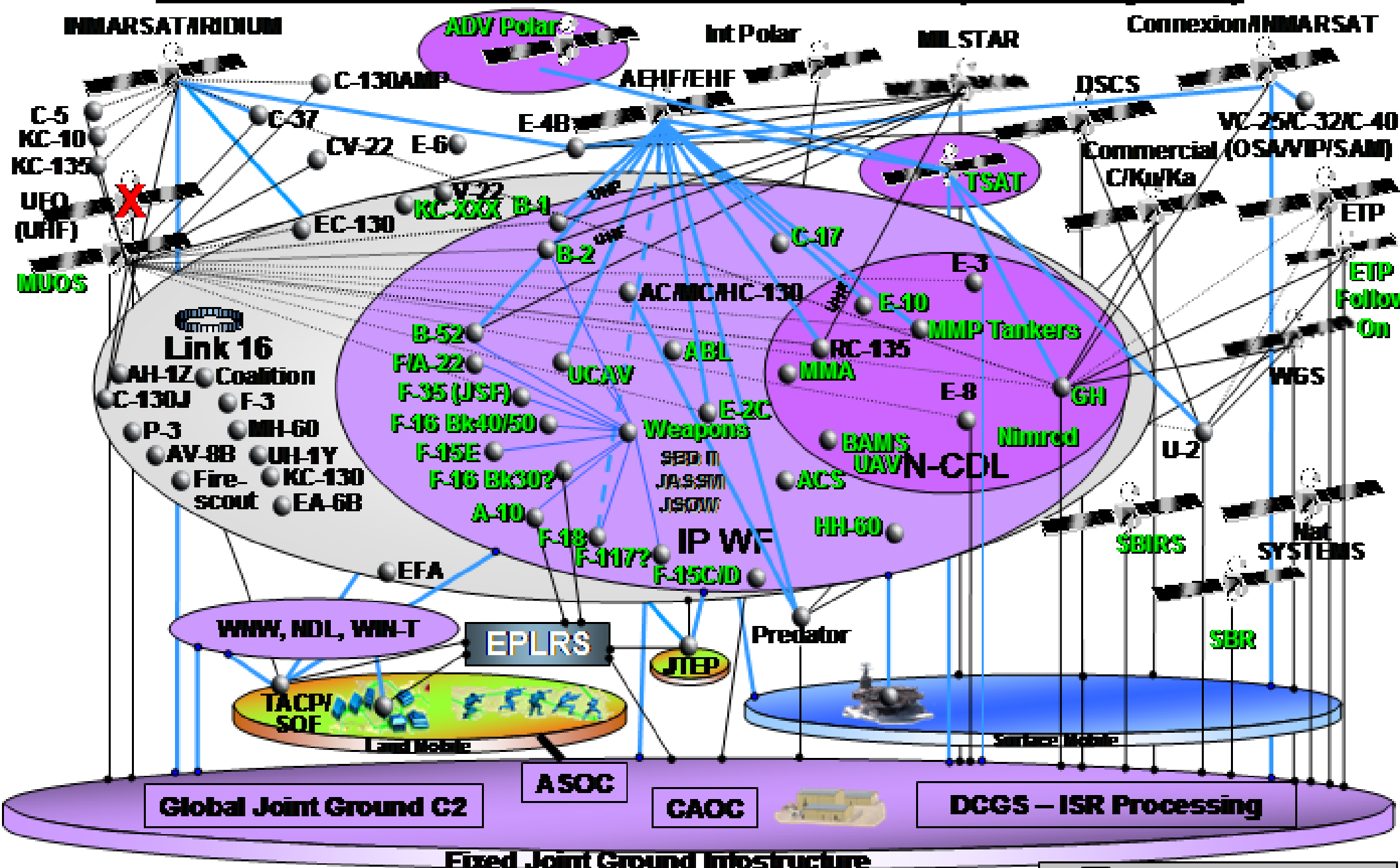


No Significant IP or Data Link Capability:
 C-5 C-130AMP C-17 HH-60 KC-10 KC-135
 NMROD E-6 C-40 AIP HH-53E SH60
 HH-60H P-3(L11) UH-1Y AH-1Z

Future platforms: E-10 ABL UCAV CV-22 MMA
 BAMS UAV ACS

**Potential to put Wideband IP based
 Capability into shown aircraft**

Envisioned FY 13 Constellation Net (Air & Space)

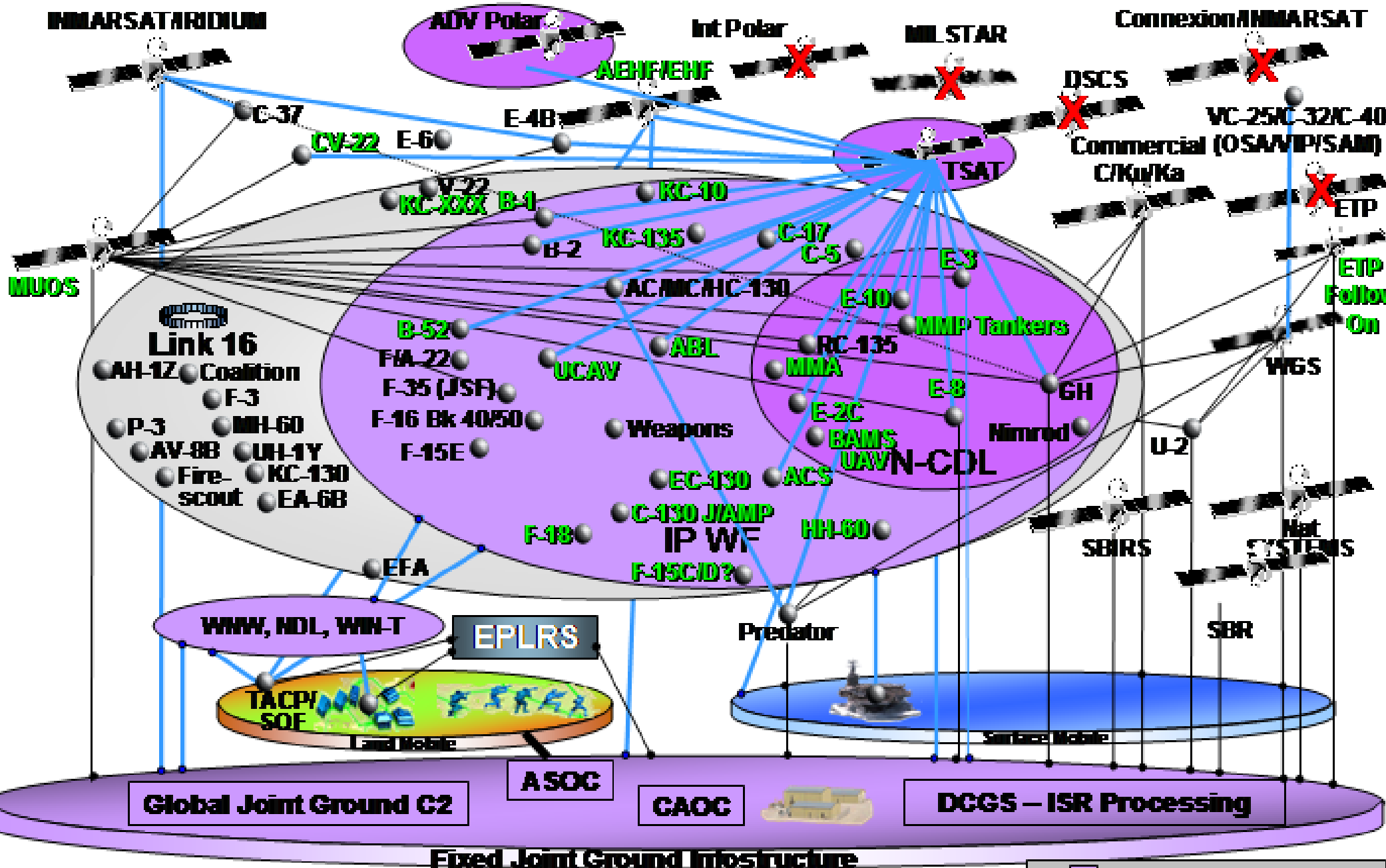


No Significant IP or Data Link Capability:
 C-5 C-130AMP KC-10 KC-135 CV-22 E-6
 C-40 AP MH-53E SH60 HH-60H

Future platforms: E-10 ABL UCAV CV-22
More Aircraft connected via Link 16
Forwarding/gateway via ROBE, JTEP

= IP Dynamic Routing
 = IP Data
X = Decommissioned
Green Text = Added Capability

Envisioned FY 20 Constellation Net (Air & Space)



No IP or Data Link Capability:
C-40 AP

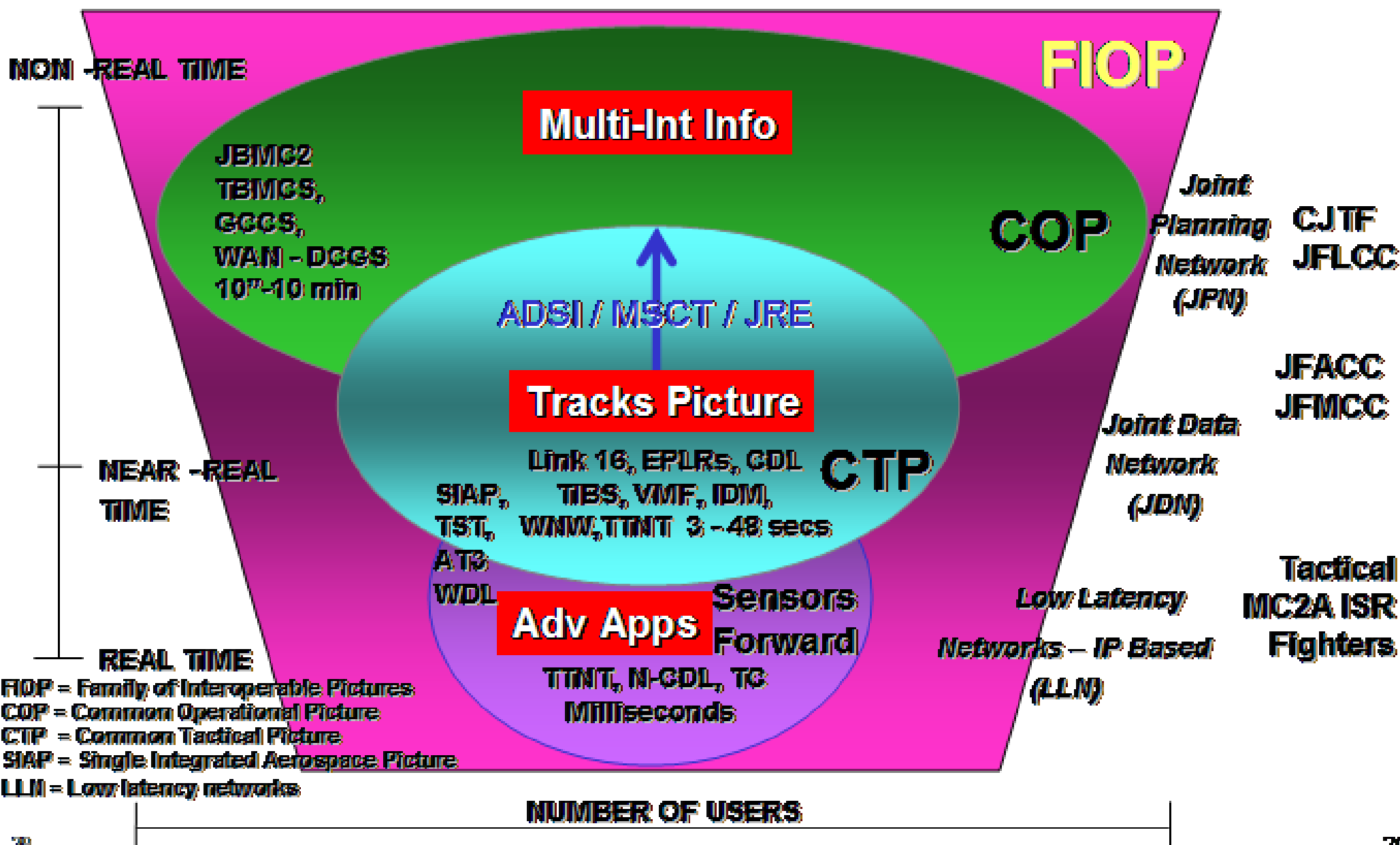
- = IP Dynamic Routing
- = IP Data
- X = Decommissioned
- Green Text = Added Capability



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Future Is Real Time

Joint Enabling Tools





All Source Intelligence indicates that an Al-Qaeda facility is present in the vicinity of FN8646.

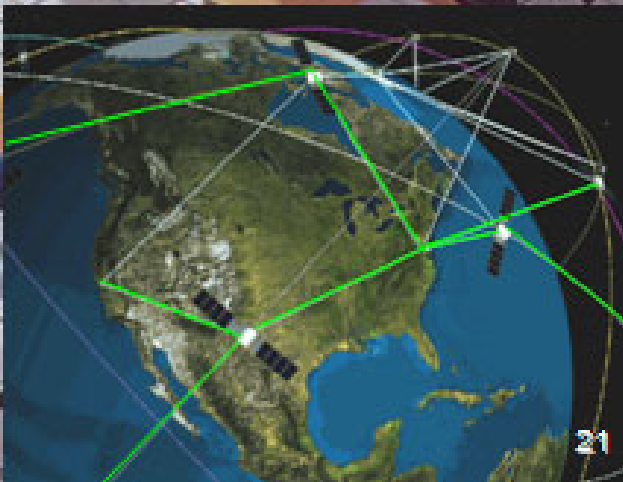
Data Gathered from NSA intercepts, Group websites, and space imagery show terrorist activities in the area, but nothing yet conclusive. 0800Z031220.

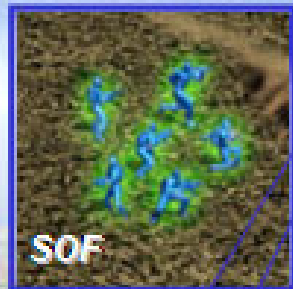


Incoming SIGINT intelligence from Navy SSN operating in the area indicates active terrorist operations in the vicinity. 0800Z031222.

SIGINT report confirmed by most recent space imagery collection. 0800Z031222.

Information shared between National Agencies & Services at All C2 Levels

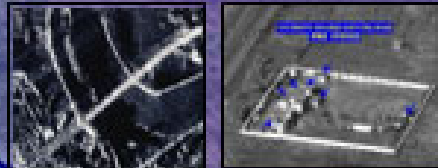




SOF

Al-Qaeda facility located – occupants unknown, no other intel available.

Latest Imagery:



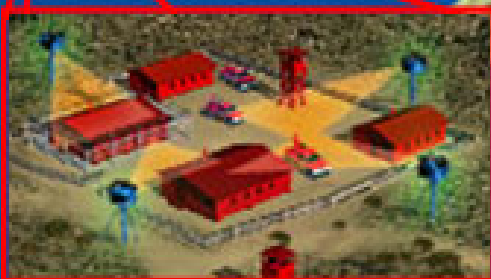
PBA Analysis:

Facility used for bomb-making and Leadership meetings.

Nearest sensors:

Global Hawk (20 min ETA)
MC2A on orbit in vicinity
SOF team (2 hours ETA)

FN06924687



CURSOR OVER THE TARGET OPTIONS:

CUE
INVESTIGATE

ID
SHADOW
IO
TARGET

RECOMMENDATION :

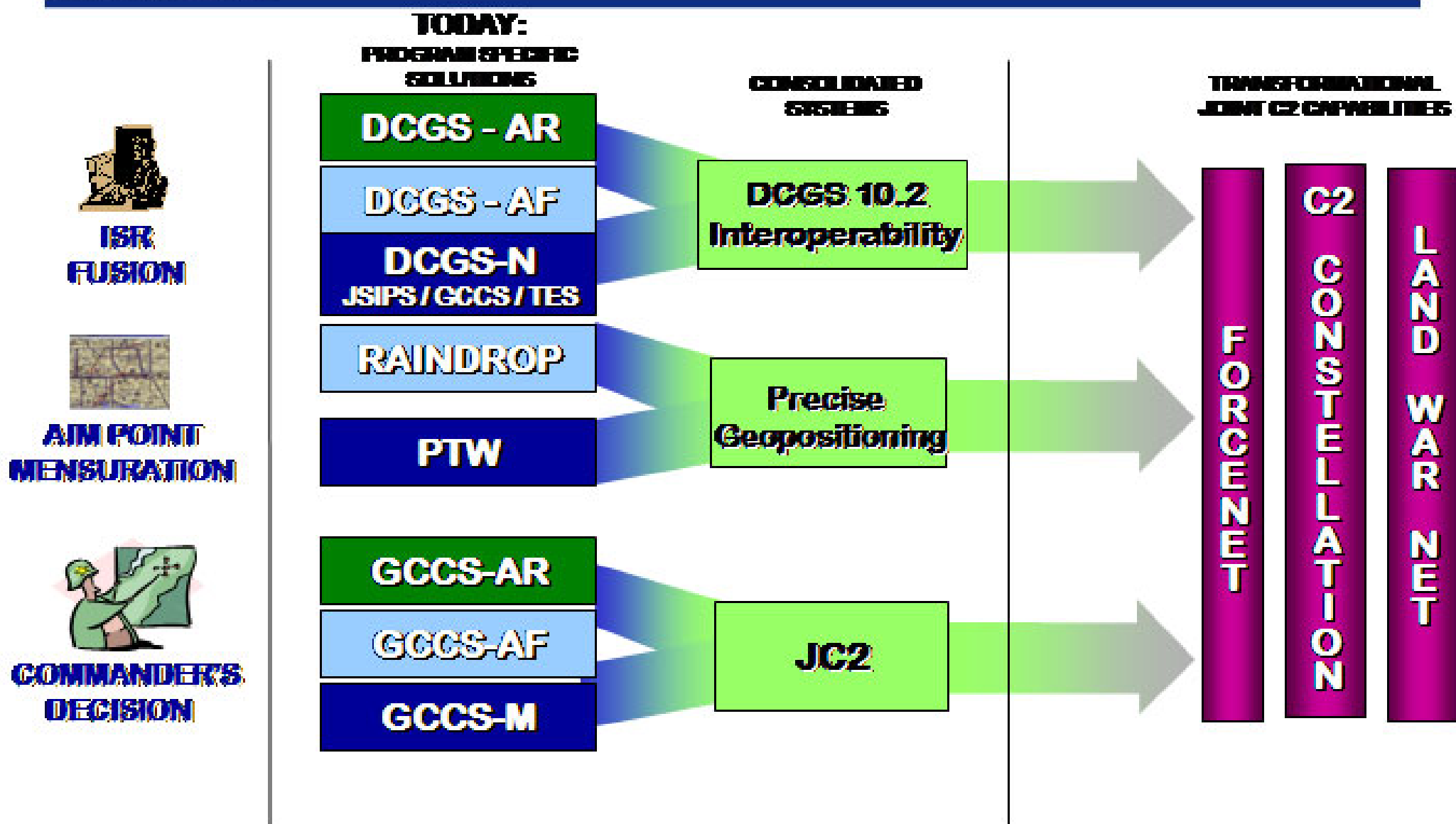
GH being retasked,
MC2A moving to support,
and SOF team notified
of emerging mission.

Rationale: Established
Mission Priorities



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Initial Service Efforts





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Initial Service Efforts

**TODAY:
PROGRAM SPECIFIC
SOLUTIONS**

SINGARS

Link 16

CEC

F-16

F/A-18

**CLUSTER 1
GROUND**

**CLUSTER 4
AIRBORNE**

**CLUSTER 3
FIXED SITES**

**CONSOLIDATED
SYSTEMS**

**Common TDL
Roadmap
CLIP, JCN,
JRE**

JSF

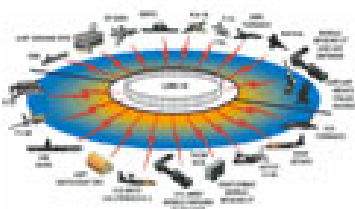
JTRS

**TRANSFORMATIONAL
JOINT CAPABILITIES**

**COMMON
SENSOR
STRATEGY**

**COMMON
WEAPONS
TARGETING**

**COMMON
COMM**



**SENSOR
FUSION**

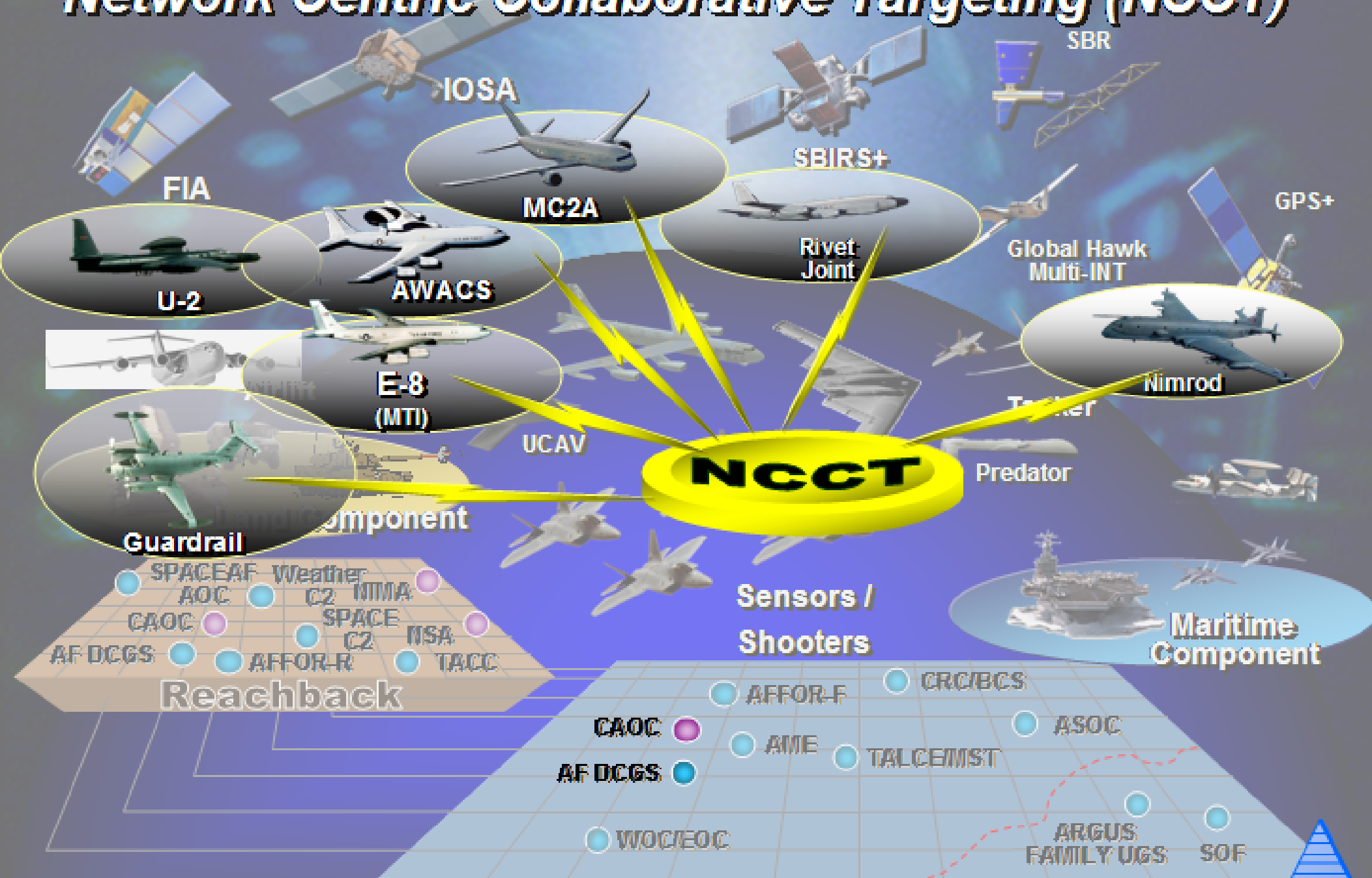


**PLATFORM
FUSION**

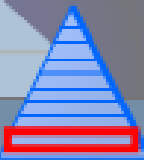


**COMMUNICATION
COLLABORATION**

Network Centric Collaborative Targeting (NCCT)



Goal: Machine-To-Machine Interface, **Theater**
 Seamless, Efficient, Self-Forming, Self-Healing.





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JMC2A Key Capabilities

Sensors Forward Integrator for Joint Ops



Space Connectivity

Seamless Connectivity
Global Hawk
Rivet Joint
JSTARS

Initial Strike Globally
Support Follow-on
Real-time Battle Management
C2 on Board

MTI target cueing to Shooters

UAV Control

Focused AMTI for CMD Spec Caps

Enhanced SAR (10x)

Improved GMTI (5-10x)
Wide Area Surveillance

JTF JBMC2 NODE

AOC APPS & TOOLS

Integrated ISR

- Common Operationalized Picture
- Predictive Battlespace Awareness

On-scene AOR-wide BMC2

- ATO Execution
- Dynamic Re-tasking
- Efficient TCT Ops
- Improved Combat ID

C2 and Intel Reachback

Joint and Combined Connectivity

Joint Deep Strike Ops

- Joint G2
- CSAR/SOF Support

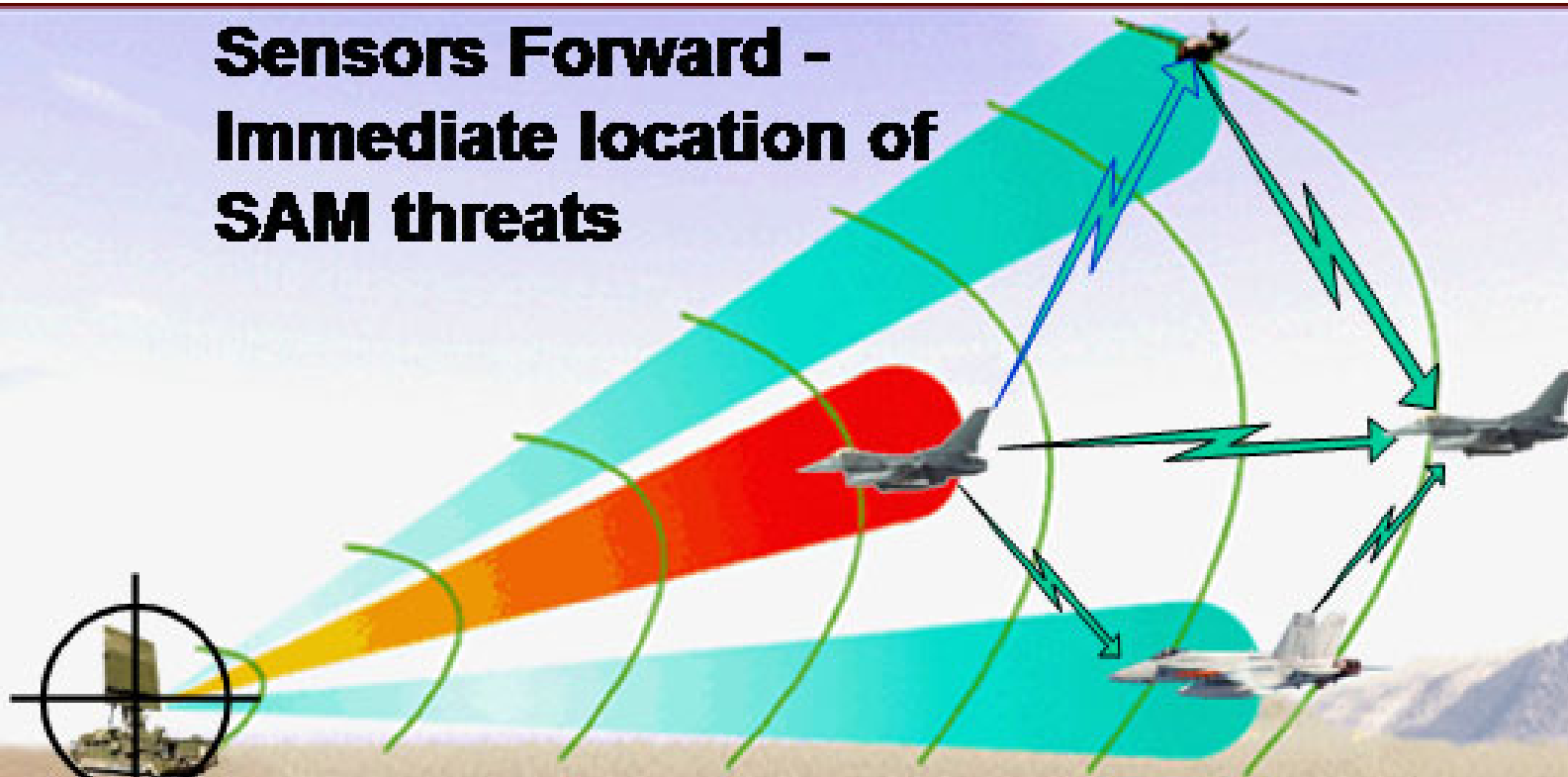
DJG2



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Advanced Tactical Targeting Technology (AT3)

**Sensors Forward -
Immediate location of
SAM threats**

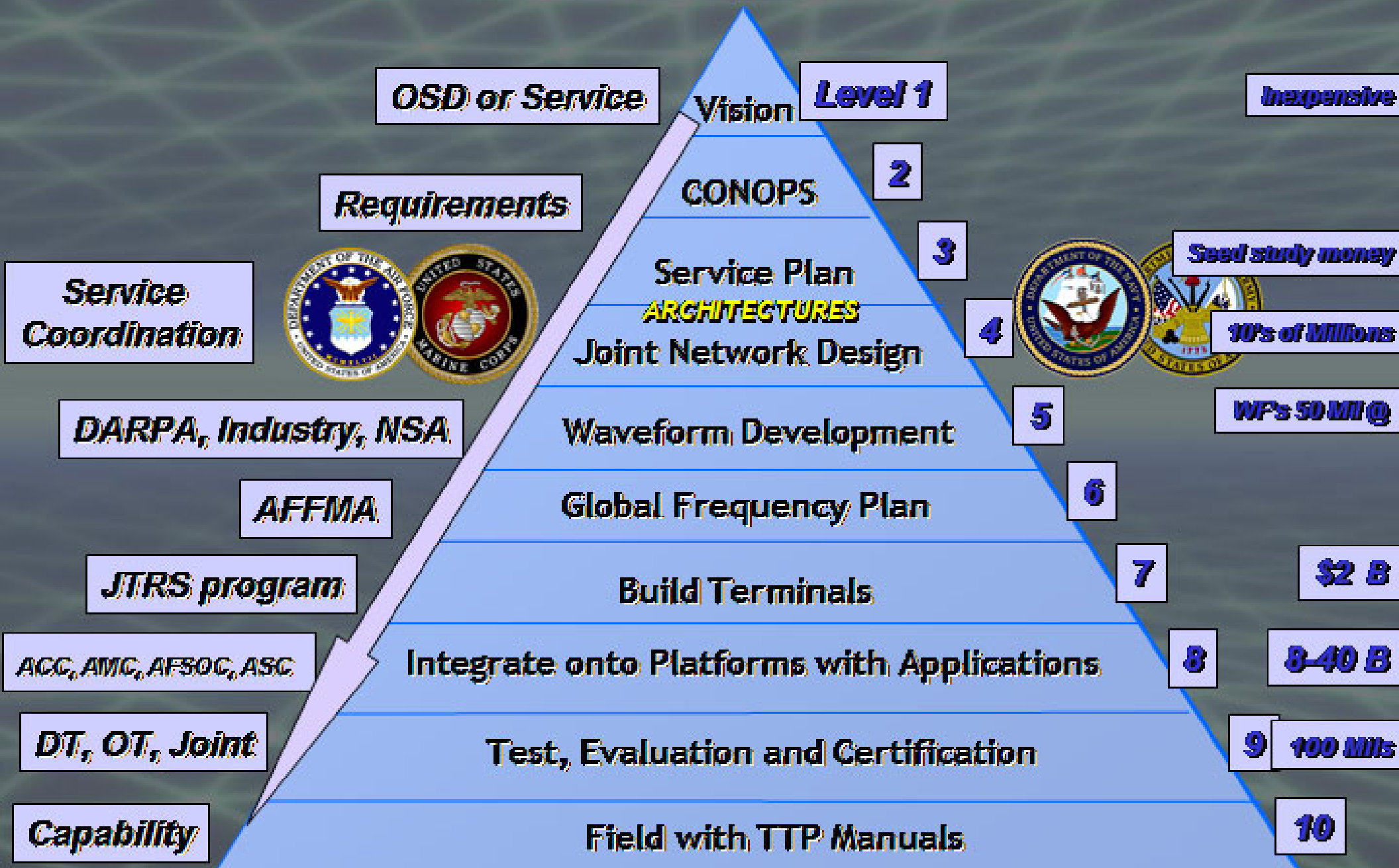


**Long standoff range
Very short on-time
Threat Moves**

AT3 GOAL: 50 meter CEP @ 50 nm standoff within 10 seconds

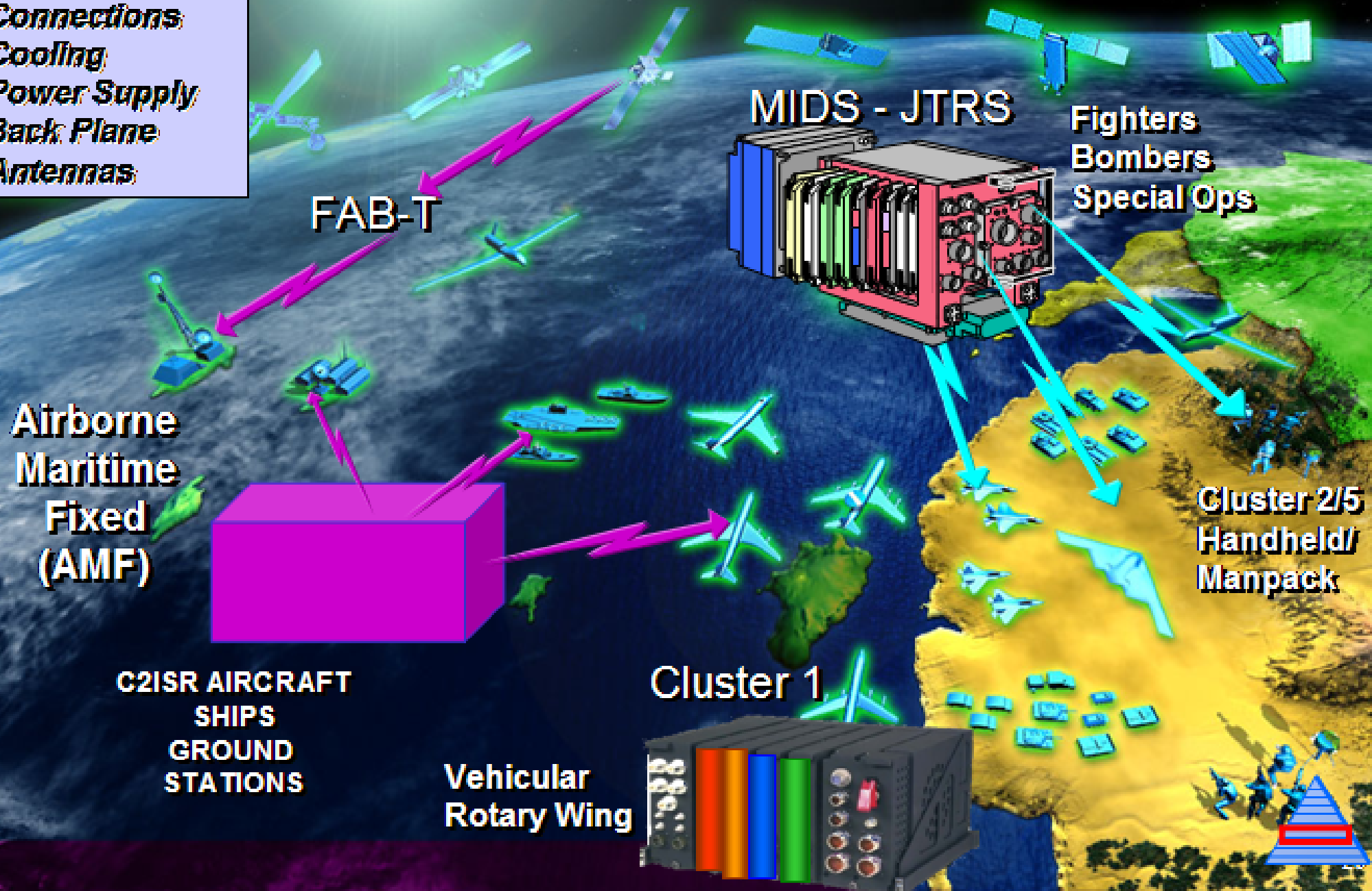


Elements to Develop Joint Net-Centric Warfare

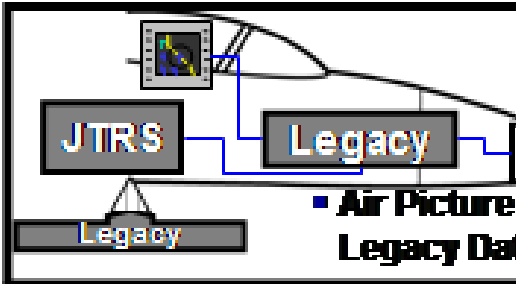
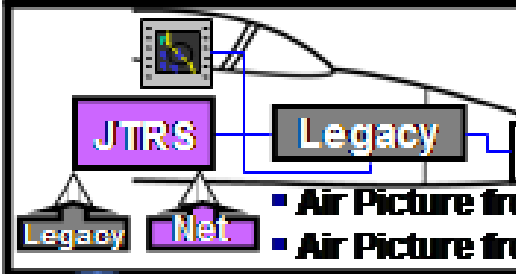
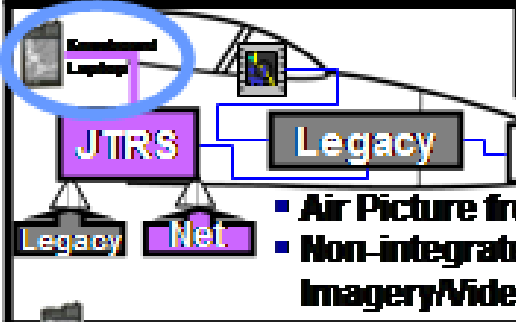
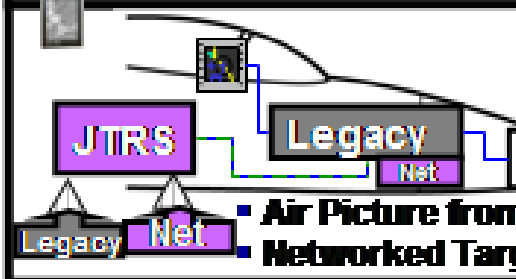
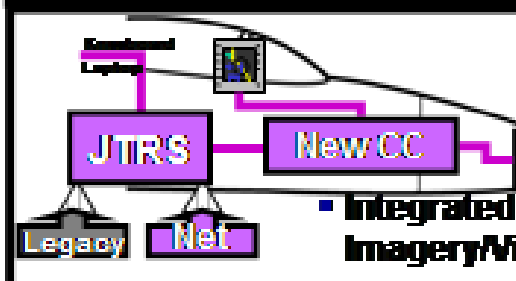


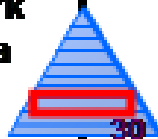
Tactical Node Connection: Joint Tactical Radio System

Chassis
Channel Slots
Power Amplifier
Crypto
Connections
Cooling
Power Supply
Back Plane
Antennas



Levels of Aircraft Network Enabling

 <p>Level 0</p> <ul style="list-style-type: none"> Air Picture from Legacy Data Link 	<p>Level 0</p>	<p>Computer Equivalent</p> <ul style="list-style-type: none"> Using Computer as a Word Processor 	<p>Example</p> <ul style="list-style-type: none"> Link 16 Ground Track from Link 16 	<p>What You Get</p> <ul style="list-style-type: none"> Legacy IER JTRS Policy Compliance
 <p>Level 1*</p> <ul style="list-style-type: none"> Air Picture from Legacy Air Picture from Net 	<p>Level 1*</p>	<p>Computer Equivalent</p> <ul style="list-style-type: none"> Send/Receive Word Documents from Net <p>Platforms: B-1, A-10, F-15 etc.</p>	<p>Example</p> <ul style="list-style-type: none"> Link 16 Ground Track from GIG 	<p>What You Get</p> <ul style="list-style-type: none"> Legacy IER M2M GIG Connected
 <p>Level 2*</p> <ul style="list-style-type: none"> Air Picture from Legacy Non-integrated Data/Imagery/Video from Net 	<p>Level 2*</p>	<p>Computer Equivalent</p> <ul style="list-style-type: none"> Internet Explorer on Desktop <p>Platforms: AC-130, Tankers</p>	<p>Example</p> <ul style="list-style-type: none"> Desktop Capability (e.g. E-mail, MPR/SIPR, etc.) 	<p>What You Get</p> <ul style="list-style-type: none"> Man-in-the-loop GIG Connected
 <p>Level 3*</p> <ul style="list-style-type: none"> Air Picture from Legacy Networked Target Collation 	<p>Level 3*</p>	<p>Computer Equivalent</p> <ul style="list-style-type: none"> "Sharing" a Word Document with your workgroup 	<p>Example</p> <ul style="list-style-type: none"> Intra flight Sensor Data Sharing 	<p>What You Get</p> <ul style="list-style-type: none"> Integrated M2M targeting collaboration
 <p>Level 4*</p> <ul style="list-style-type: none"> Integrated Data/Imagery/Video 	<p>Level 4*</p>	<p>Computer Equivalent</p> <ul style="list-style-type: none"> Some Level of Bill Gates' House <p>Platforms: E-10, F-35, UCAV</p>	<p>Example</p> <ul style="list-style-type: none"> Target Video 	<p>What You Get</p> <ul style="list-style-type: none"> Fully integrated M2M Network enabled data exchange





WDL Design Considerations

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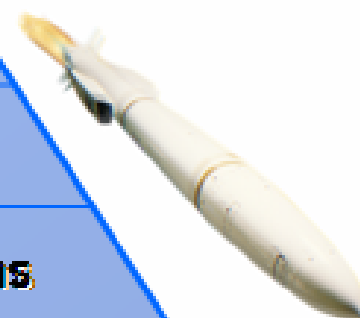
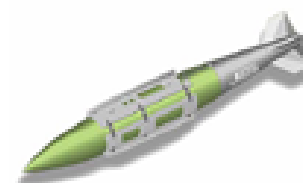
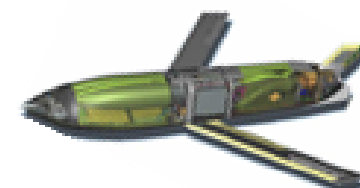
Blue Force Posit
Coord Attack
Positive Handoff



Dismounted SOF
PID/CDE
Easy function
Light, Small, Tough
Batteries
Target & scoot



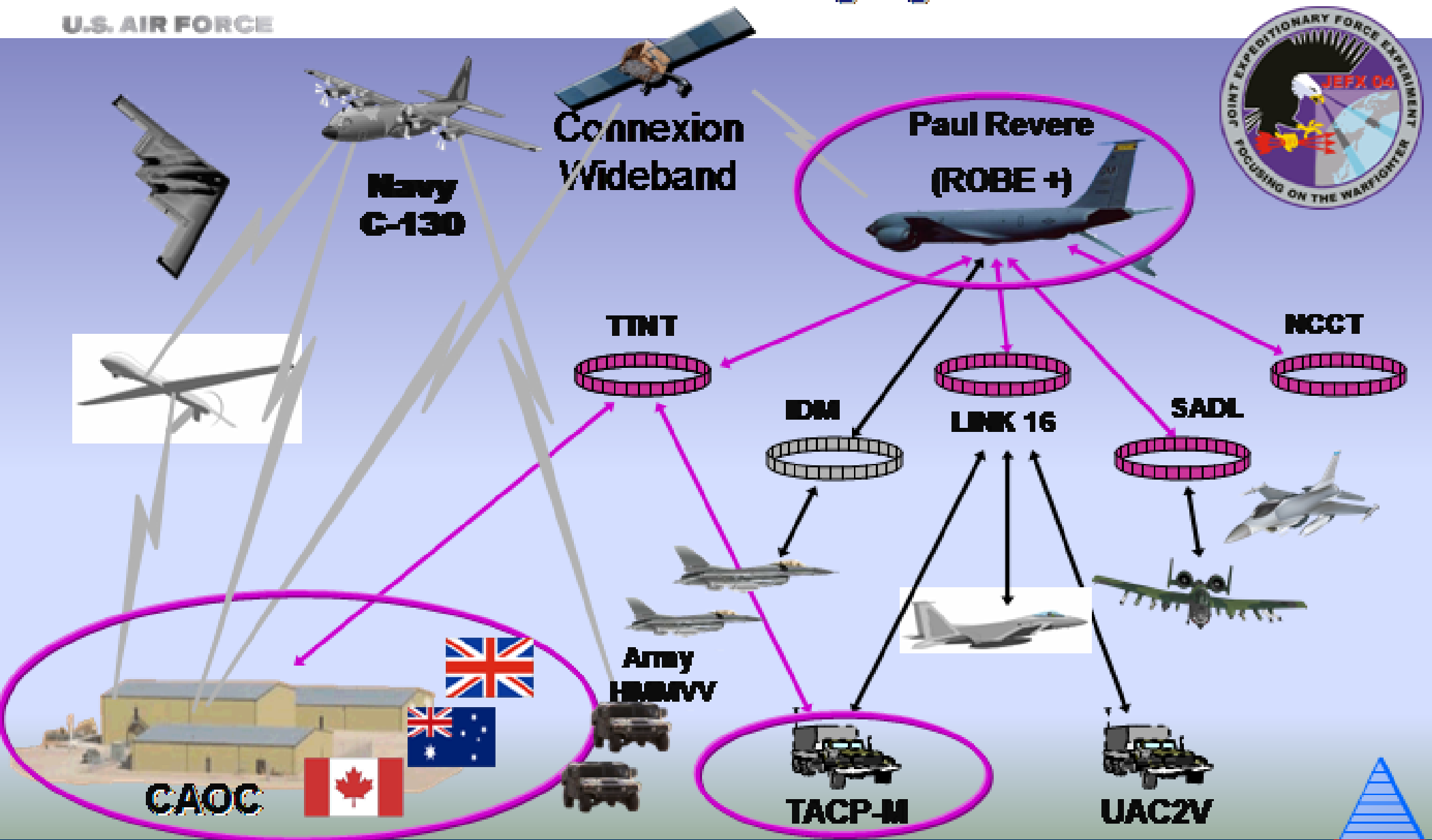
Enhanced GPS
Adv navigation
Positive control
Bi-directional comm
Effect options
Instant BIA



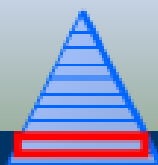


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A Coalition JEFX 04 Wringing Out Joint NetOPs



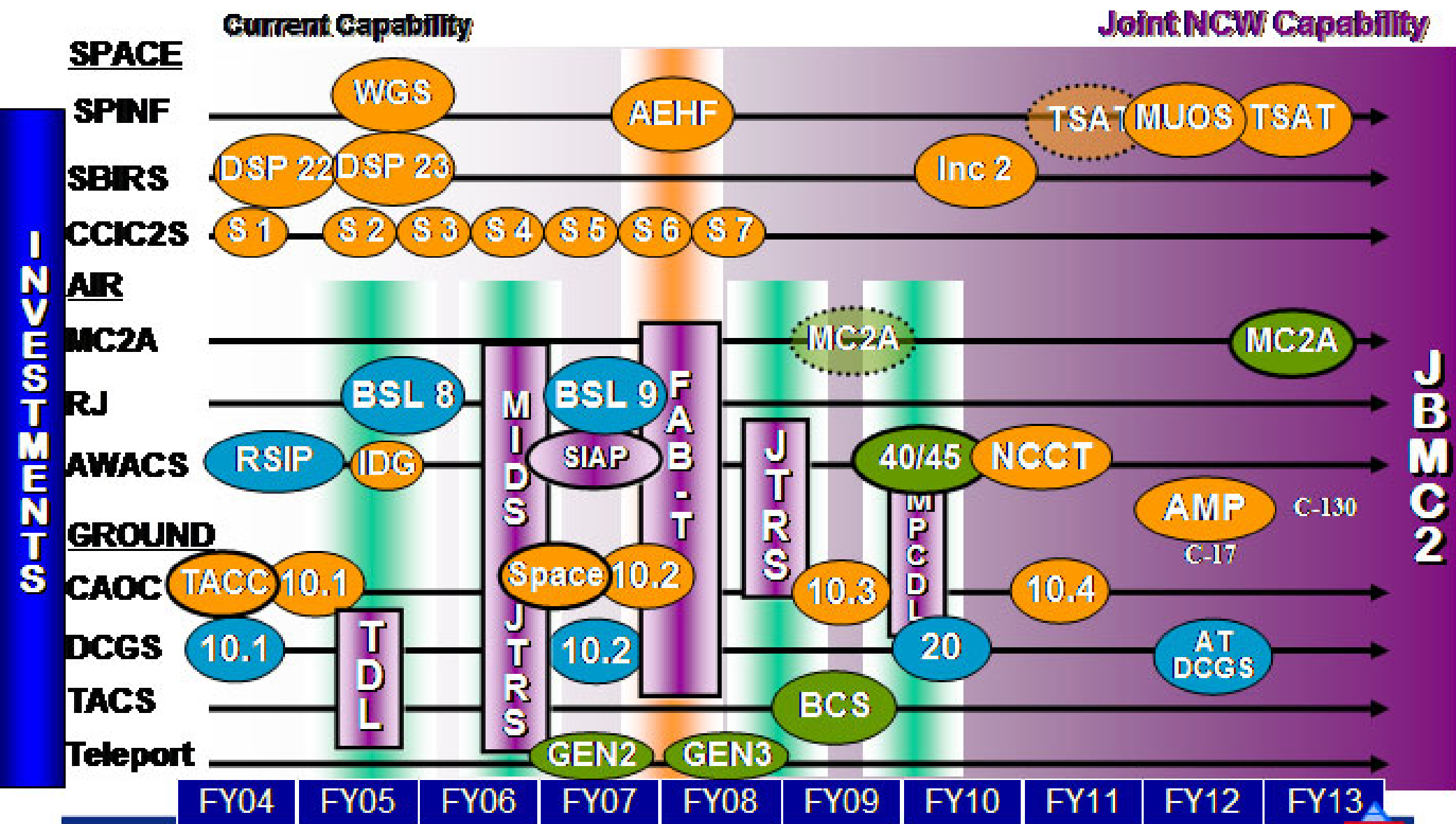
JEFX ... Delivering Integrated Capability to the Joint Warfighter





Integrating JBMC2 with NCW

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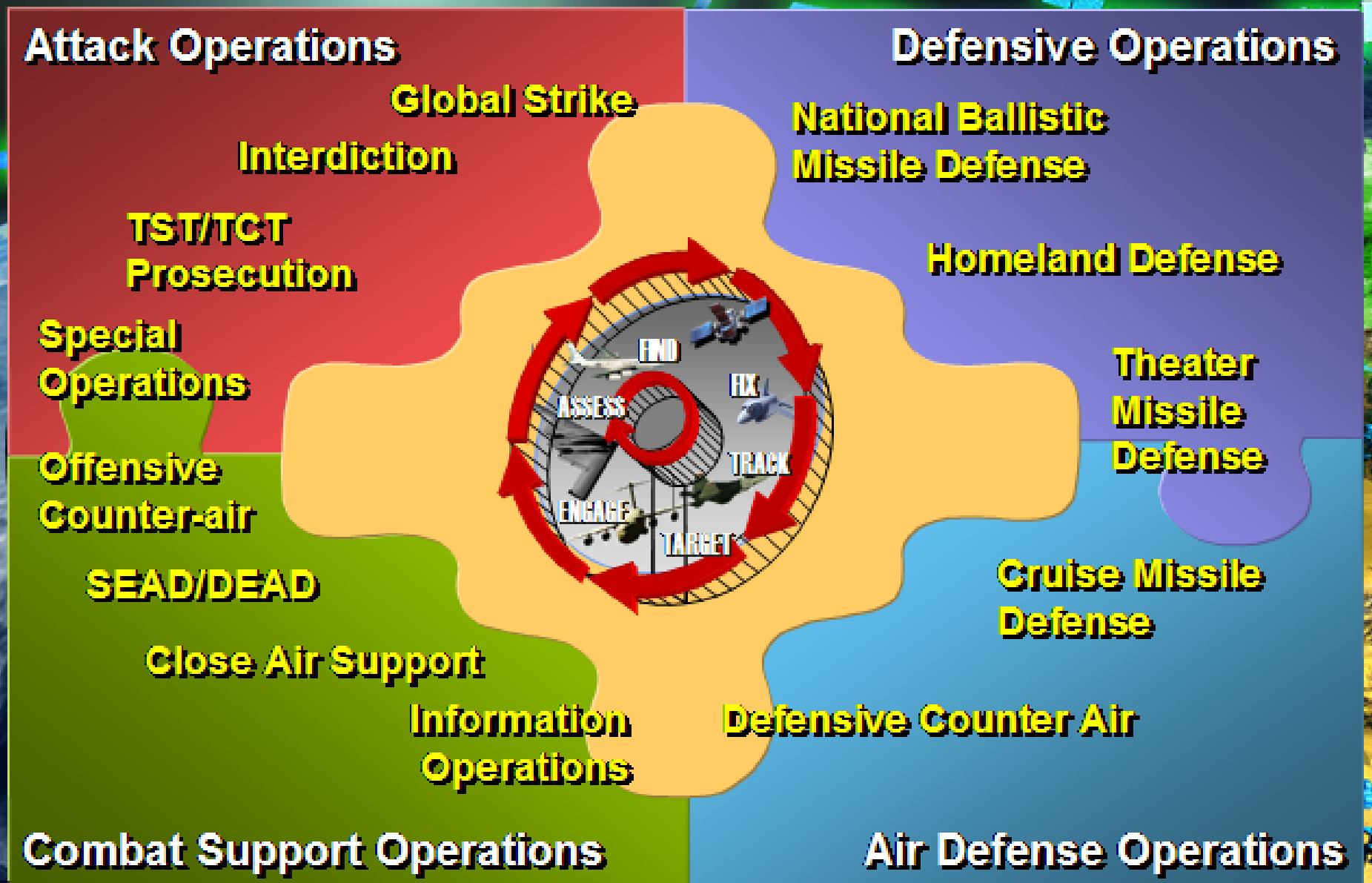


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J B M C 2



Connectivity & Joint Applications Yield Capability



Connectivity & Joint Applications Yield Capability



**Network
Centric
Combat
Capability**



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In Summary

Air Force is fully committed to co-developing integrated capabilities delivering **Joint effects** by significant investment in time, resources, and people to advance **Joint Net-Centric Capability**



Sum of all Wisdom: Placing the Cursor over the Target, the Operator Doesn't Care Where the Info Came From