

Headquarters U.S. Air Force

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Air Force Architecting: Making Federation Work



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SAF/XCPA
3 Jun 09**

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- **Architecting Value Proposition**
- **USAF Architecting First Principles**
- **Fit-for-Federation Strategy**
- **Critical Success Factors**



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Architecting Value Proposition

- **Pressures on CIOs**
 - **Align IT with mission**
 - **Reduce IT costs and overlap**
 - **Assurance, assurance, assurance**
- **Potential opportunities exceed architecting resources**
- **Need to develop concrete value propositions for architecting**

Deliver focused value for the enterprise



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First Principles of USAF Architecting

- 1. USAF Architectures are Treated as an Asset**
- 2. USAF Architectures are Used to Inform**
- 3. USAF Architectures are Used for Standardization**
- 4. USAF Architectures Specify Interoperation**
- 5. USAF Architectures Support Integration**
- 6. USAF Architectures are Guided and Constrained by the AF Enterprise Architecture**
- 7. USAF Architectures are Reflected in the AF Enterprise Architecture**



First Principles – So What?

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- **These principles reflect where we are going with architecture in the Air Force**
 - **They are reflected in our policy**
 - **They need to be reflected in our behavior**
 - **They give the architecting community a guidepost**

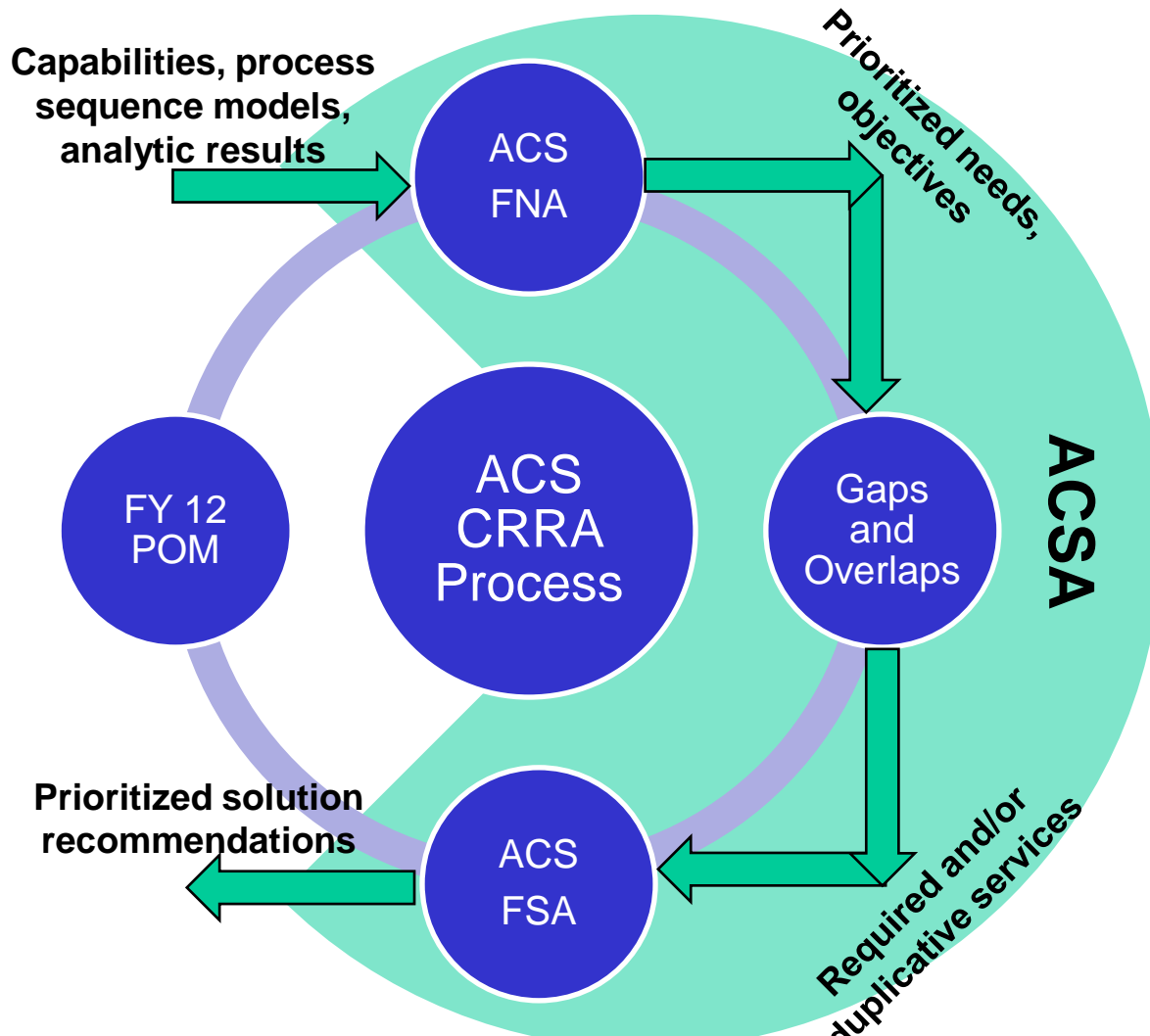


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Agile Combat Support CRRA Support



Used to influence requirements prioritization



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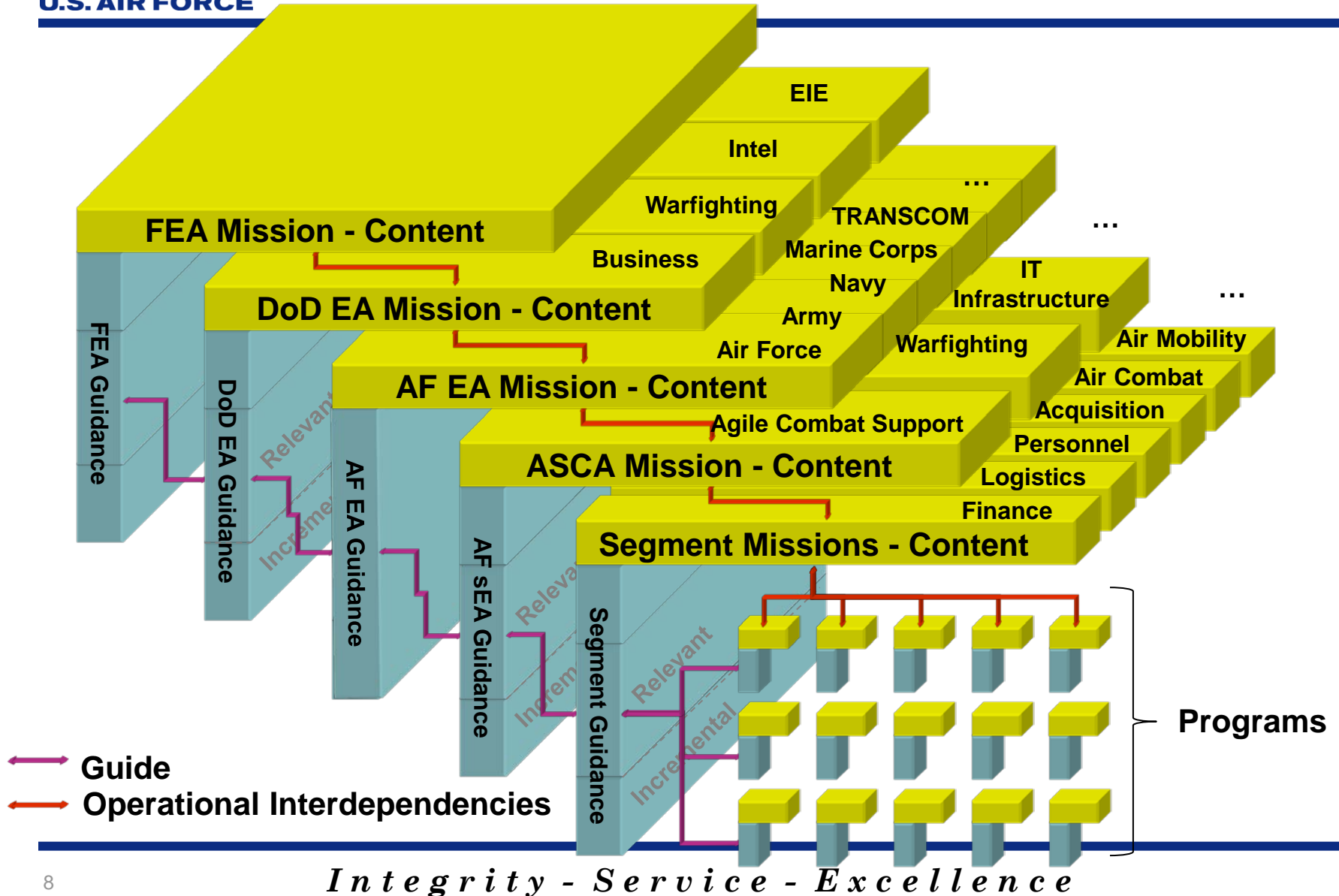
AF Architecture Federation Principles

- **Influence decision-making in the most important AF areas**
- **Empower natural development of operationally-focused AF Architecture Federation**
- **Federate based on operational interdependencies**
- **Standards (compliance criteria) applied to architectures and solutions**



Architectures in Context

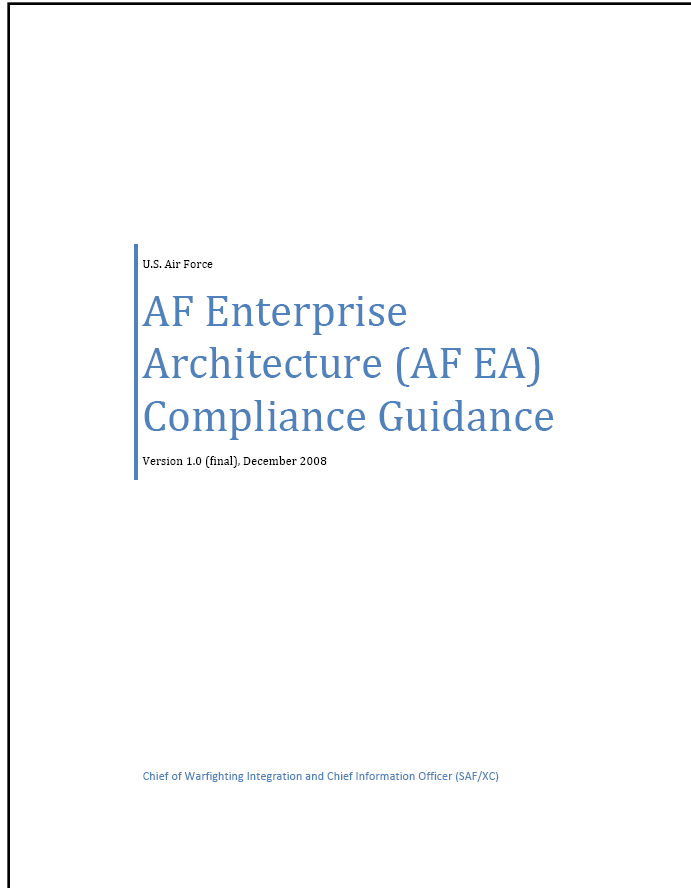
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AFEA Compliance Criteria

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Initial Criteria (48 Guidance Statements) :

- Applies directly to AF IT/NSS systems
- Derived from existing, approved, Federal, Department of Defense, and the Air Force artifacts
- May require documentation to provide evidence of conformance with the compliance criteria

Future Updates:

- Specific evidence required to satisfy each guidance statement
- Criteria identified as necessary to enable improved interoperability
- Criteria published as part of other AF approved architectures
- Criteria that apply to the programs (vice system)



Operational Interdependencies

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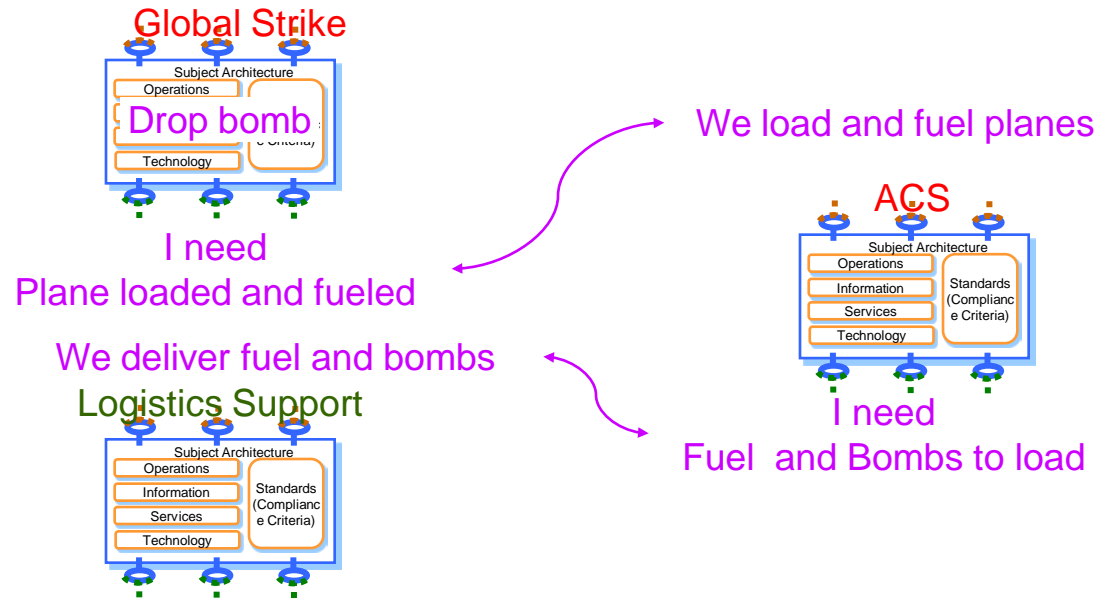
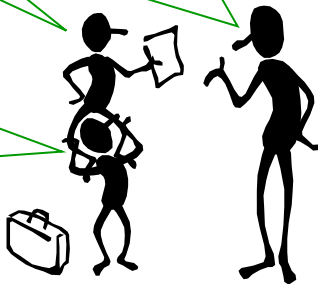
- Operational interdependency-focused models are a better foundation for federating
 - Based on an “I need/we provide” relationship pairing – i.e. a service focus (process, data, human, ...)
 - Yields healthy discussion on interdependent touch-points that are performed for the MISSION

So what? Agreement on the interface!

So all I have to do is call you?

Yep, just call this number when you need fuel and bombs loaded!

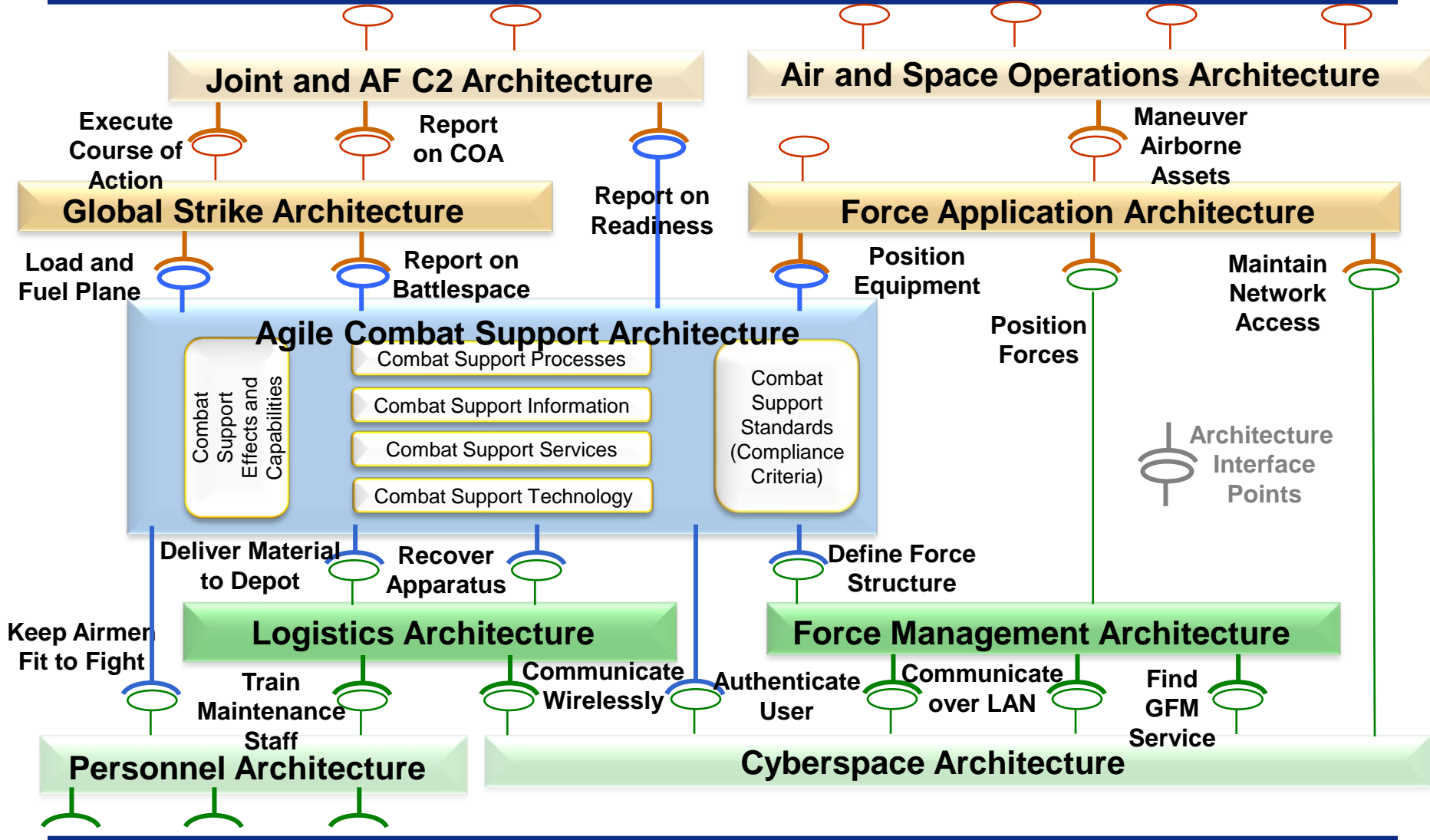
Right and you just call this number when you need fuel!





AF Architecture Federation

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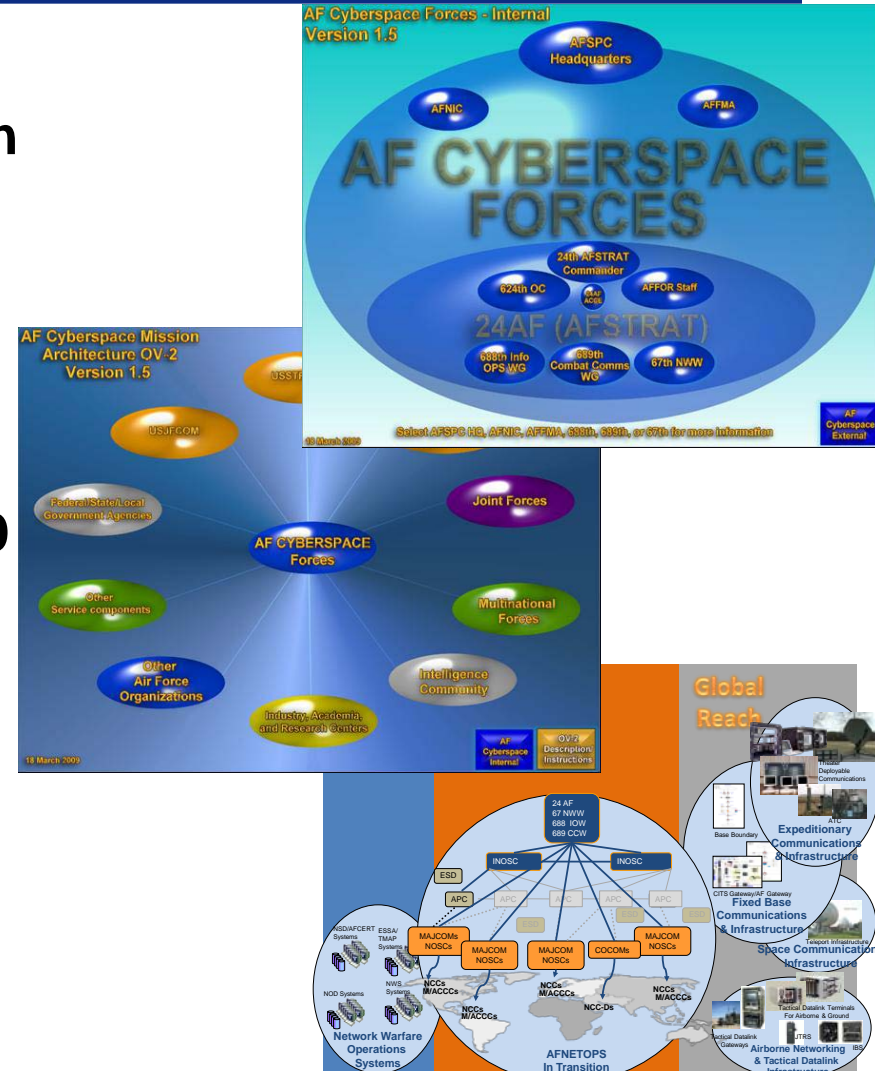
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AF Cyberspace Mission Architecture v1.5

- Focused on mission as described in PAD 07-08 Change 3
- Add measurable value to stand-up of AF Cyberspace mission; inform PPLAN development
- Analysis provided 17 findings and 9 recommendations
- Initial development plan:
 - Decision-making support
 - Mission threads



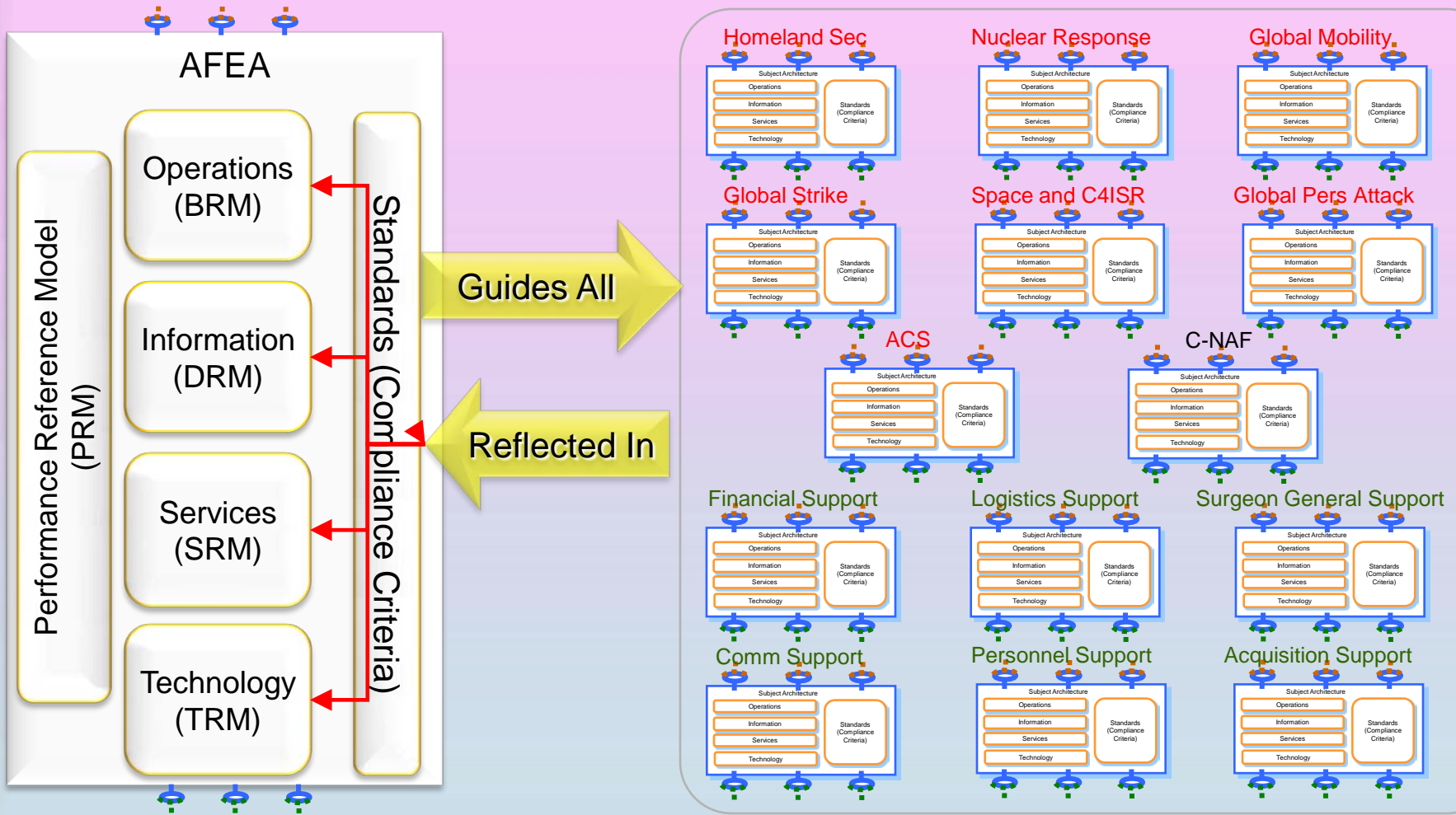
Used to influence organizational stand-up



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AF Architecture Federation and AF Enterprise Architecture Role

AF Architecture Federation View

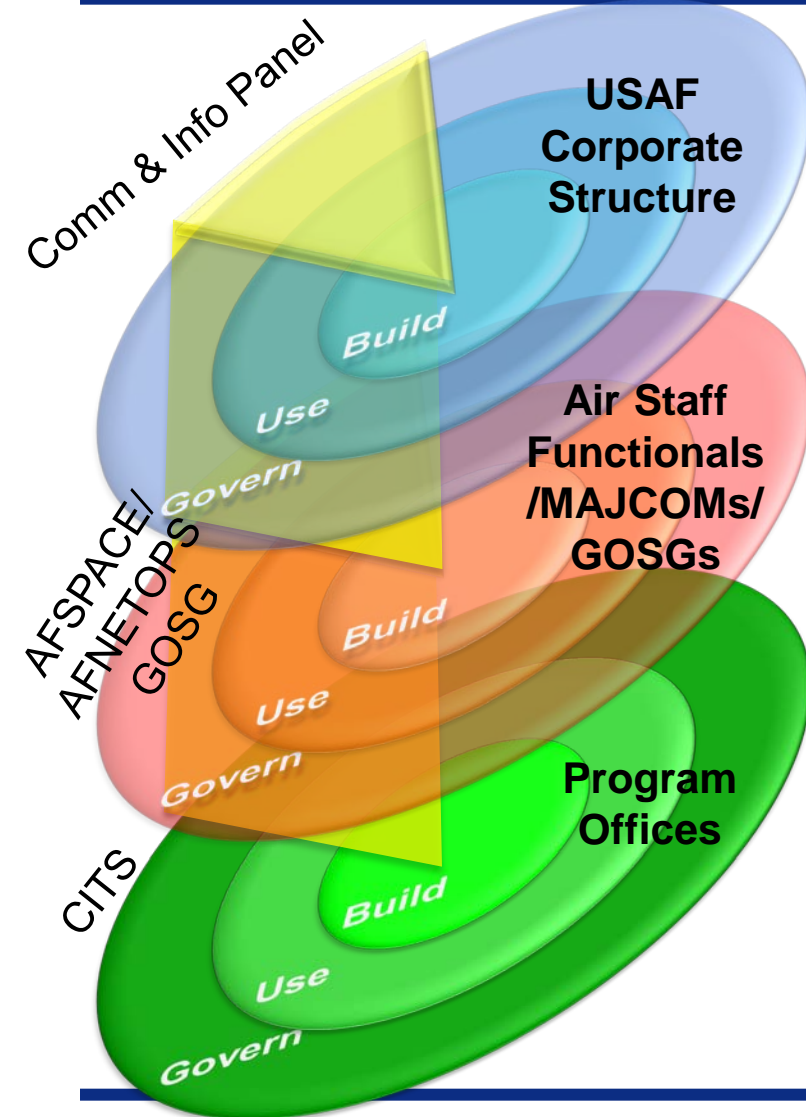


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EA CONOPS Effort



- “Enterprise level” support of Air Force Corporate Structure panels; influence \$ and constrain downstream
- “Intermediate level” support of staff functionals and lead commands; influence \$, determine executing organization, and constrain downstream
- “Program level” support of Program Offices; influence \$, responsibilities within a program, and what and how to constrain implementation

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Critical Success Factors

- **Effective, structured governance processes**
- **Leadership champion for use of architecture in decision-making**
- **Engaged stakeholders**
- **Operational/mission focus vice technology push**
- **Clear requirements/outcomes articulated by users**
- **Architecture team and skills matched to project**

Architecting: Enabling better decision-making



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Questions?



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Backups



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Why Architect the Enterprise?

- **The primary reasons an Enterprise Architecture exists is to:**
 - **Inform**
 - **Guide, and**
 - **Constrain**
- **the DECISIONS of the Enterprise, especially those related to IT investments**

An Enabling Tool to support **Decision Making!**



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1. *USAF Architectures are treated as an Asset*

- Air Force treats architecture information as an Air Force asset
- Implications (Air Force will)
 - Establish and implement an AF architecture governance process and structure to oversee Air Force architectures
 - Ensure all Air Force architectures are accessible in a secured manner
 - Take measures to ensure that architectures are understandable, useable, and applicable to day-to-day activities
 - Promote the development and usage of tools, methodologies and databases to enable the sharing, integration, interoperation, and reuse of architecture information





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2. *USAF Architectures are used to Inform*

- Air Force designs and employs architecture to inform decisions of the Air Force by providing the linkage of business and operations to resources
- Implications (Air Force will)
 - Build architectures to analyze problems and answer questions
 - Ensure that specific information from architectures is integrate-able by the selection of a minimum set of architecture standards
 - Ensure that architectures are as simple and straightforward

"Everything should be made as simple as possible, but not one bit simpler. "

A. Einstein.





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3. USAF Architectures are used for Standardization

- Air Force uses architecture information to identify the appropriate standards and enforce them through compliance criteria
- Implications (Air Force will)
 - Build “As Is” and “To Be” architectures and transition plans to guide future action
 - Ensure that architectures generate compliance criteria that are intended to be applied to related architectures and solutions
 - Specifically employ architecting to established information technology (IT) standards



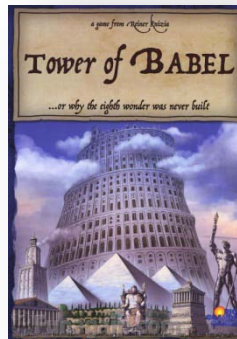
Standardization Bruno Minigou (c) 03, Paris.



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4. *USAF Architectures Specify Interoperation*

- Air Force imposes minimum architecture standards to ensure architecture support interoperability
- Implications (Air Force will)
 - Assess ability of architectures to support interoperation
 - Divide the Air Force into segments and empower their development
 - Federate architectures based on operational interdependencies
 - Ensure architectures use/reuse elements
 - Take steps to manage the common taxonomy
 - Manage architecture compliance covering architectures and programs





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5. USAF Architectures Support Integration

- Air Force imposes minimum architecture standards to support enterprise analysis
- Implications (Air Force will)
 - Adopt an architecture exchange vocabulary
 - Enforce usage of an approved architecture exchange vocabulary
 - Promote development and usage of tools, methodologies and databases to enable reuse of architecture information



$$\int \frac{x+5}{x^2-2x-3} dx$$
$$\frac{5}{3} dx = \int x^{\frac{2}{3}} dx - \int \frac{1}{x+3}$$
$$= 2 \ln(x-3) - \ln(x+3)$$
$$= \ln \frac{(x-3)^2}{x+3} + C$$



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6. *USAF Architectures are Guided and Constrained by the AF Enterprise Architecture*

- Air Force Enterprise Architecture (AFEA) guides and constrains all Air Force Architectures
- Implications (Air Force will)
 - Build AFEA that relates key Air Force institutional processes and IT
 - Ensure that Air Force architectures align to and comply with AFEA
 - Absorb applicable guidance and constraints within the Air Force Enterprise Architecture
 - Ensure architectures are capability and mission focused, and do not inappropriately constrain product selection





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7. USAF Architectures are Reflected in the AF Enterprise Architecture

- Air Force Enterprise Architecture reflects all Air Force architectures through AF Reference Models
- Implications (Air Force will)
 - Provide process to submit to Air Force Architecture Federation
 - If AF architecture criteria met, then AFEA absorbs the appropriate data
 - Ensure architectures submitted use the appropriate standards





Air Force Architecture Framework (AF-AF)

