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USNORTHCOM
Integrated
Architecture:
A Means to an End

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Overview



- **United States Northern Command – Who We Are**
- **Architecture in the Federal Government**
- **Architecture Development & Processes at US Northern Command**
- **US Northern Command Architecture Tool**
- **US Northern Command Architecture Status and Progress**

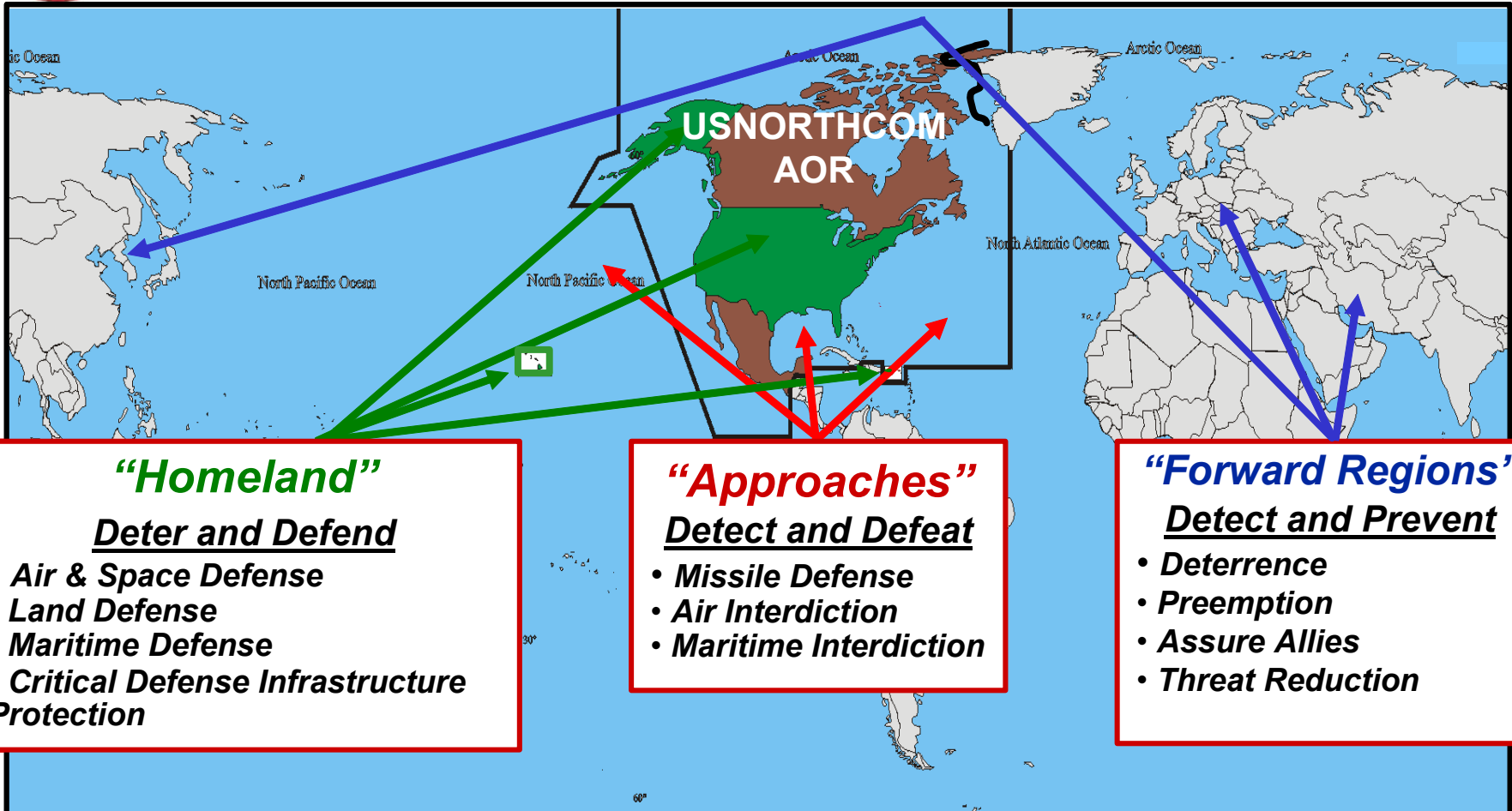


Mission & Vision Statements

United States Northern Command conducts military operations to deter, prevent and defeat threats and aggression aimed at the United States, its territories and interests within assigned areas of responsibility; as directed by the President or Secretary of Defense, provides military assistance to civil authorities, including consequence management operations

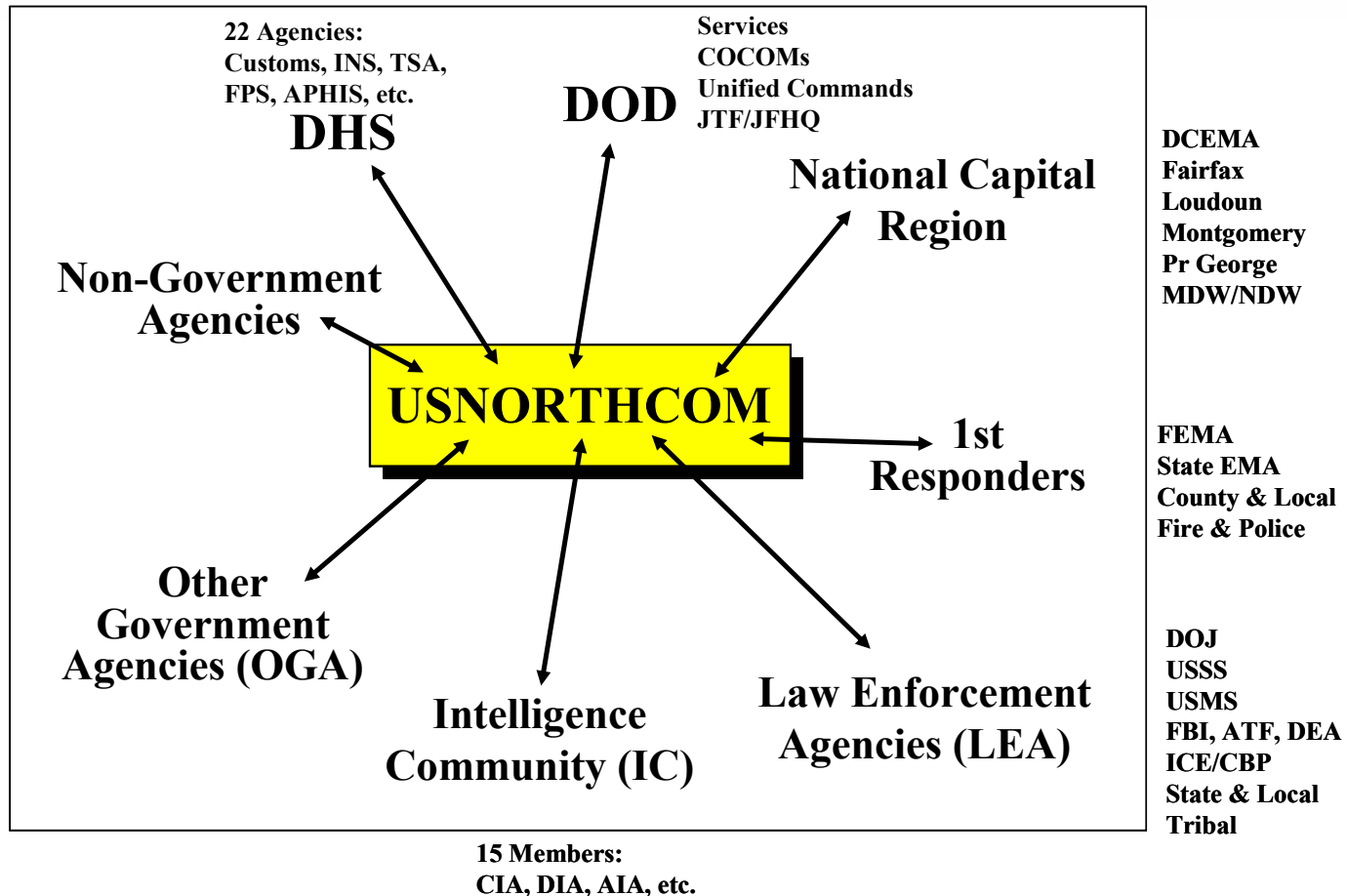
*Deter, Prevent, Defeat, Mitigate:
Protecting Americans where they live and work*

Concept of Operations



USNORTHCOM Layered Defense Concept

Connectivity - Communities of Interest



USNORTHCOM must interoperate with over 600 other agencies/entities





Architecture in the Federal Government

- **GAO Enterprise Architecture Management Maturity Framework (EAMMF)**
 - **Stage 1:** Creating awareness
 - **Stage 2:** Building the management foundation
 - **Stage 3:** Developing products
 - **Stage 4:** Completing products
 - **Stage 5:** Leveraging to manage change
- 2001 survey of 93 federal departments and agencies:
100% below Stage 5 (83% in Stages 1 or 2)
- 2003 survey of 96 federal departments and agencies:
99% below Stage 5 (90% in Stages 1 or 2) (7 years after Act)

*Architecture is not easy to implement--
Average stage was 1.33 in 2003*



Architecture Primary Functions

- Identify DOTMLPF gaps, shortfalls, and duplications
- Identify prioritized solutions for the DOTMLPF gaps, shortfalls, and duplications (linked to strategic objectives, i.e, strategic vision key result areas, command critical capabilities, and Joint Mission Essential Tasks)
- Identify funding profiles for the DOTMLPF solutions
- Identify timelines for implementing the DOTMLPF solutions
- Identify technical standards and compliance for the N-NC information exchange environment
- Work subordinate unit mission needs to include JTFs, OPCON forces, etc.
- Manage the Enterprise Architecture as a Program

*Focus on the primary uses of the architecture data
as we develop a net-centric architecture approach*

Decision Support

1

2

3

Gather N-NC enterprise information: mission, people, schedule, \$\$, etc...

Issue arises!
Specific information needed...

...combine into products needed to help analyze the issue and make a decision

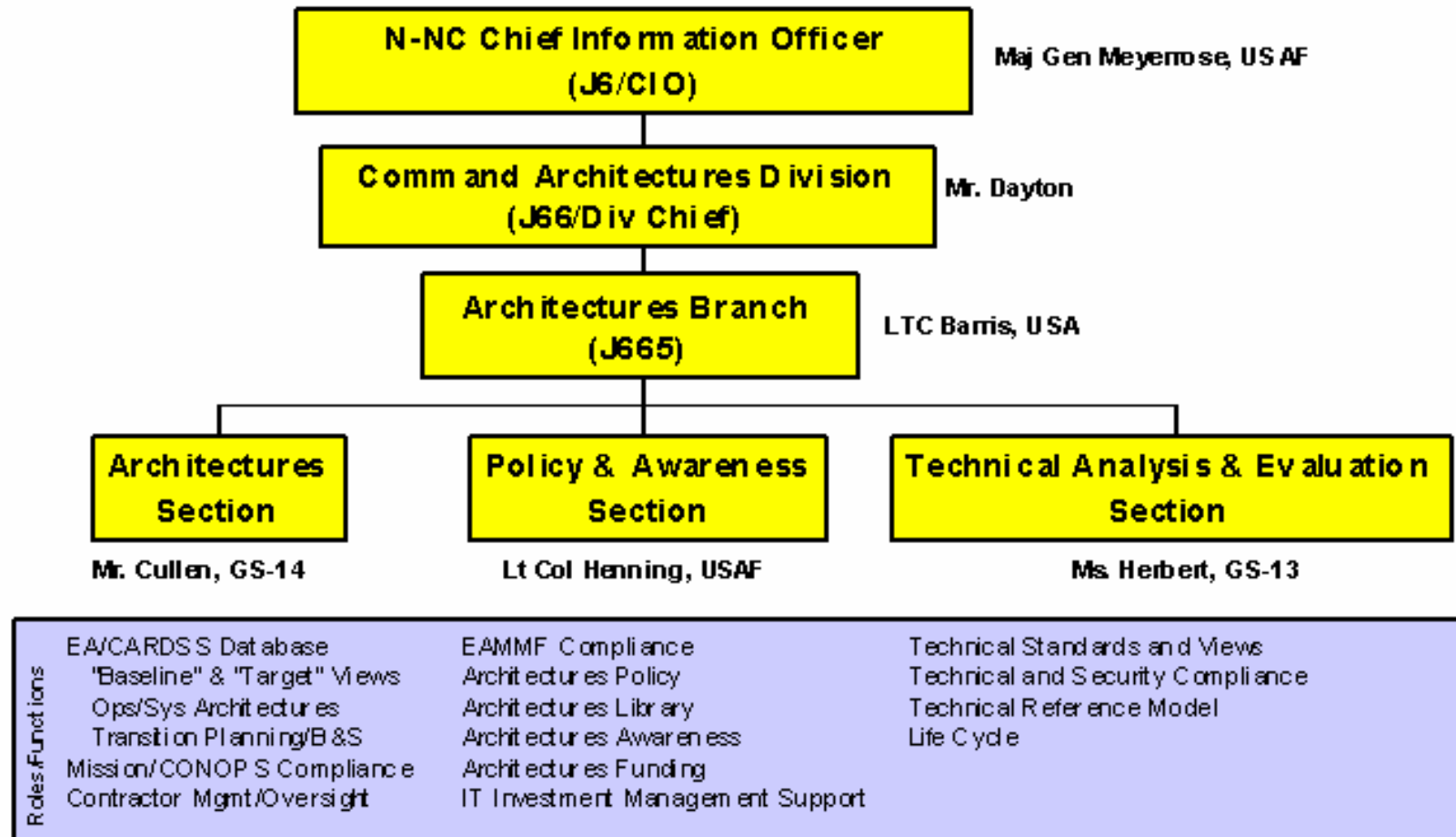
	Data	Function	Network	People	Time	Motivation
Planner's View	List of Things Important to Business Entity/Class of Business Thing	List of Processes the Business Performs Function/Class of Business Process	List of Locations Important to Business Node/Agent Business Location	List of Organizations Important to Business Agent/Major Org Unit	List of Events Significant to Business Time/Event Business Event	List of Business Goals/Strategies End/Mission/Major Business Goal/CSF
Owner's View	e.g. Entity Relationship Diagram Entity-Business Entity Relationship Data	e.g. Function Flow Diagram Function/Process Business Process	e.g. Logistics Network Node-Business Location Link-Business Linkage	e.g. Organization Chart Agent/Org Unit Work/Work Product	e.g. Master Schedule Time-Business Event Cycle/Business Cycle	e.g. Business Plan End-Business Objective Mission-Business Strategy
Designer's View	e.g. Data Model Entity/Class/Entity Relationship Data	e.g. Data Flow Diagram Function/Process Business Process	e.g. Distributed System Architecture Node/Info Sys Funct Link/Link Char	e.g. Human Interface Architecture Agent/Info Work/Work Product	e.g. Processing Structure Time/Event Business Event Cycle/Business Cycle	e.g. Knowledge Architecture End-Business Objective Mission-Business Strategy
Builder's View	e.g. Data Design Entity/Class/Entity Relationship Data	e.g. Structure Chart Function/Process Business Process	e.g. System Architecture Node/Info Sys Funct Link/Link Char	e.g. Human Interface Architecture Agent/Info Work/Work Product	e.g. Control Structure Time/Event Business Event Cycle/Business Cycle	e.g. Knowledge Design End-Business Objective Mission-Business Strategy
Subcontractor's View	e.g. Data Definition Entity/Class/Entity Relationship Data	e.g. Program Function/Process Business Process	e.g. Network Architecture Node/Info Sys Funct Link/Link Char	e.g. Security Architecture Agent/Info Work/Work Product	e.g. Timing Definition Time/Event Business Event Cycle/Business Cycle	e.g. Knowledge Definition End-Business Objective Mission-Business Strategy

Task Details							
NORTHCOM JMETS							
Enable C2 and Decision Making Through a Trusted Information Exchange Environment							
Supporting Task	Doctrine	Organization	Training	Material	Leadership	Personnel	Facilities
Conduct Surveillance Module Command Center (SMCC) Operations and Planning Functions							
Communicate Strategic and Operational Decisions and Information	Shortfall	Met	Shortfall	Shortfall	Shortfall	Shortfall	Shortfall
Maintain Strategic Information, Data, and Force Status	Shortfall	Met	Shortfall	Shortfall	Shortfall	Met	Shortfall
Determine Theater Situational Awareness Needs	Shortfall	Met	Shortfall	Shortfall	Shortfall	Met	Shortfall
Develop Theater COP Requirements	Shortfall	Met	Shortfall	Shortfall	Shortfall	Met	Shortfall
Maintain awareness of situations being monitored by the DWC and JOC							
Maintain Strategic Information, Data, and Force Status	Shortfall	Met	Shortfall	Shortfall	Shortfall	Met	Shortfall

Combine data elements to answer questions or produce needed products



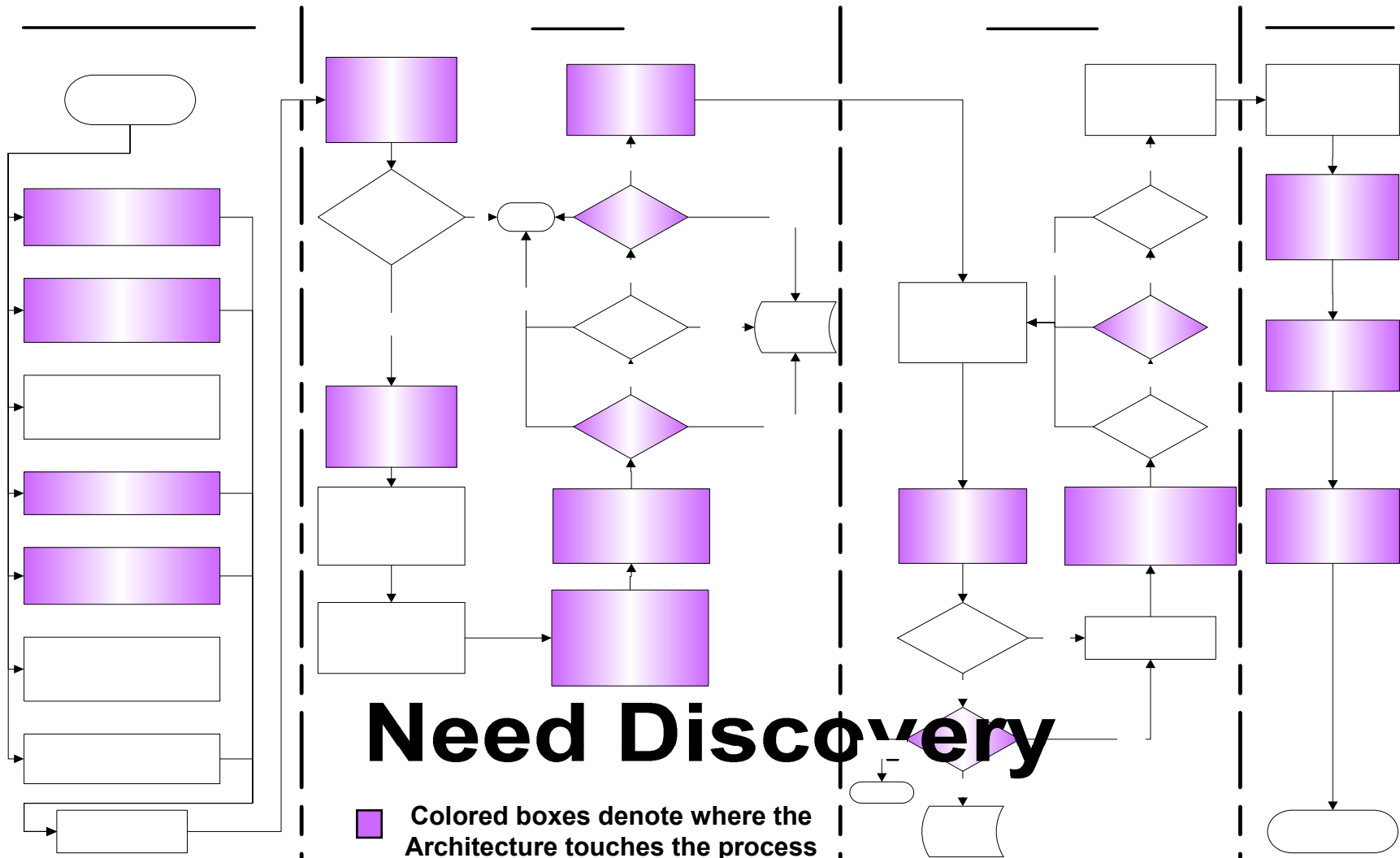
Chief Architect's Organization



*Managing the architecture effort
with a Program Management Office (PMO)*

Integrated Process

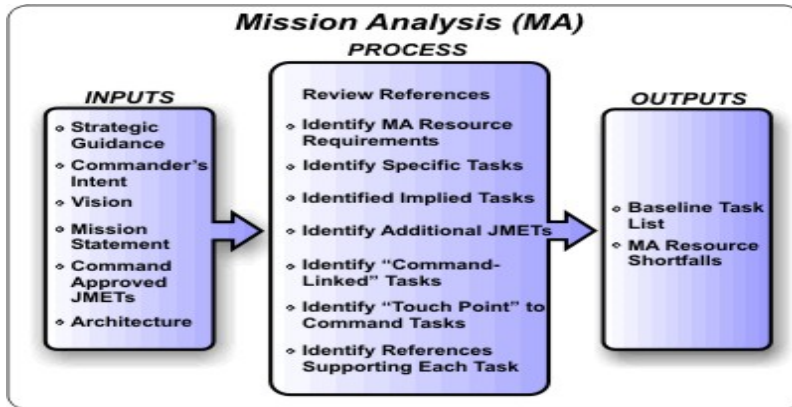
Information Sharing Capabilities Management Process



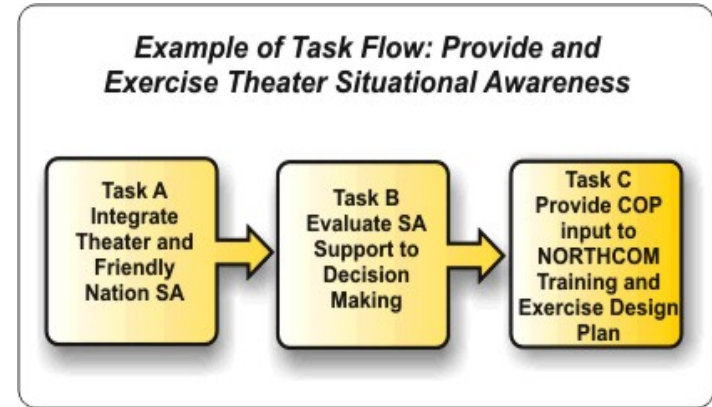


Enterprise Architecture Process

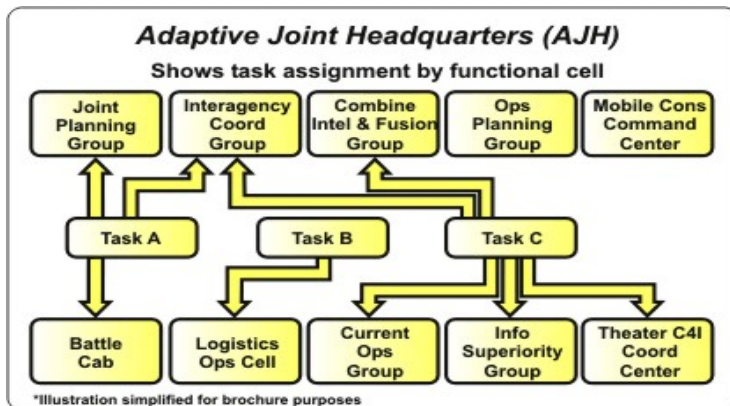
Step 1: Mission Analysis



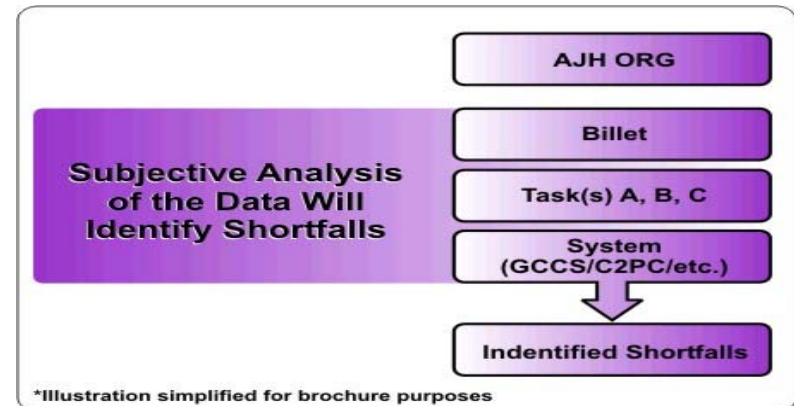
Step 2: Link Tasks by Info Exchange



Step 3: Map Tasks to Org Structure



Step 4: Identify DOTMLPF Needs



Architecture identifies gaps, shortfalls, and duplications



Adding Capabilities – Block & Spiral Approach

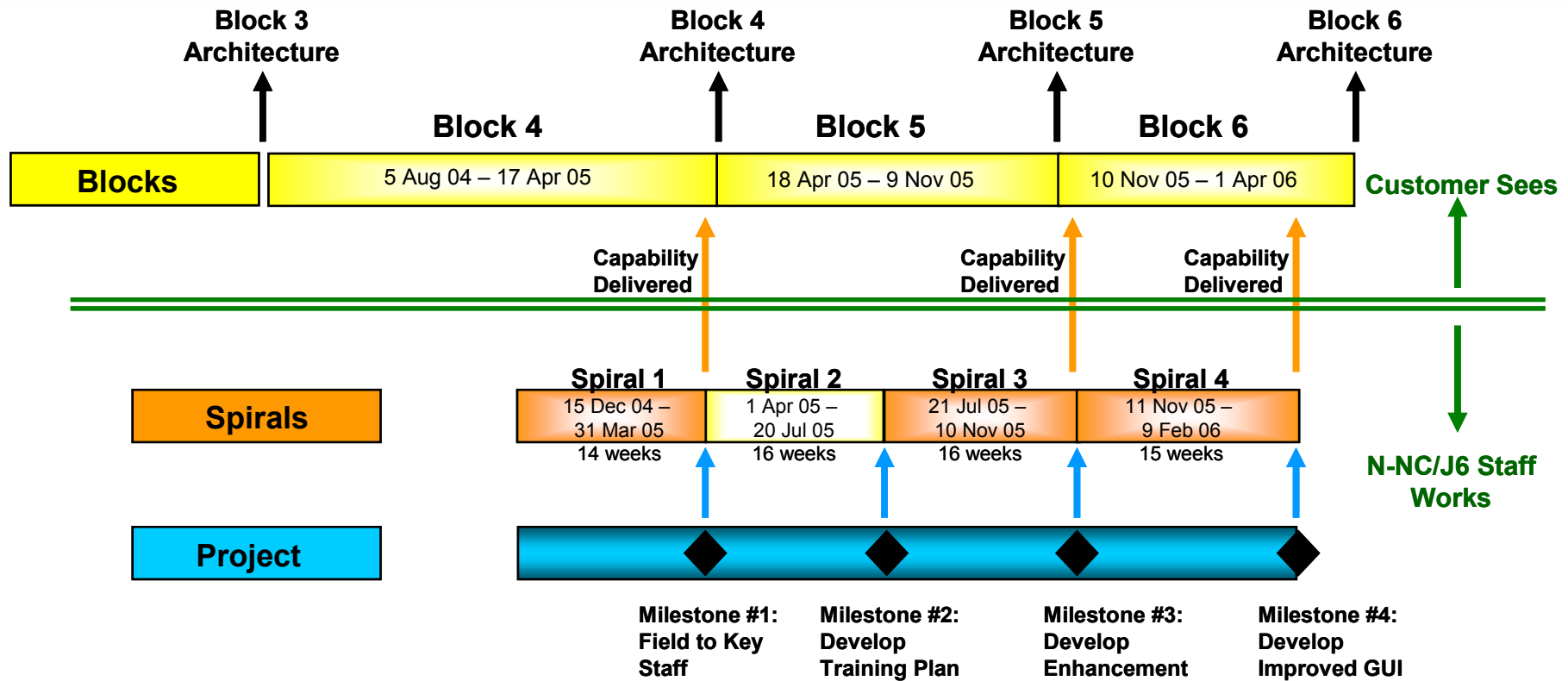
Spirals – Development cycles ≤ 16 weeks assigned to each project to focus the efforts of project managers, developers, and IT Investment Management staff. Development focus

Blocks – Periods of time (linked to command-level events) that focus on providing capabilities to the commands. User capabilities focus

Spirals focus project management efforts
Blocks focus on user capabilities

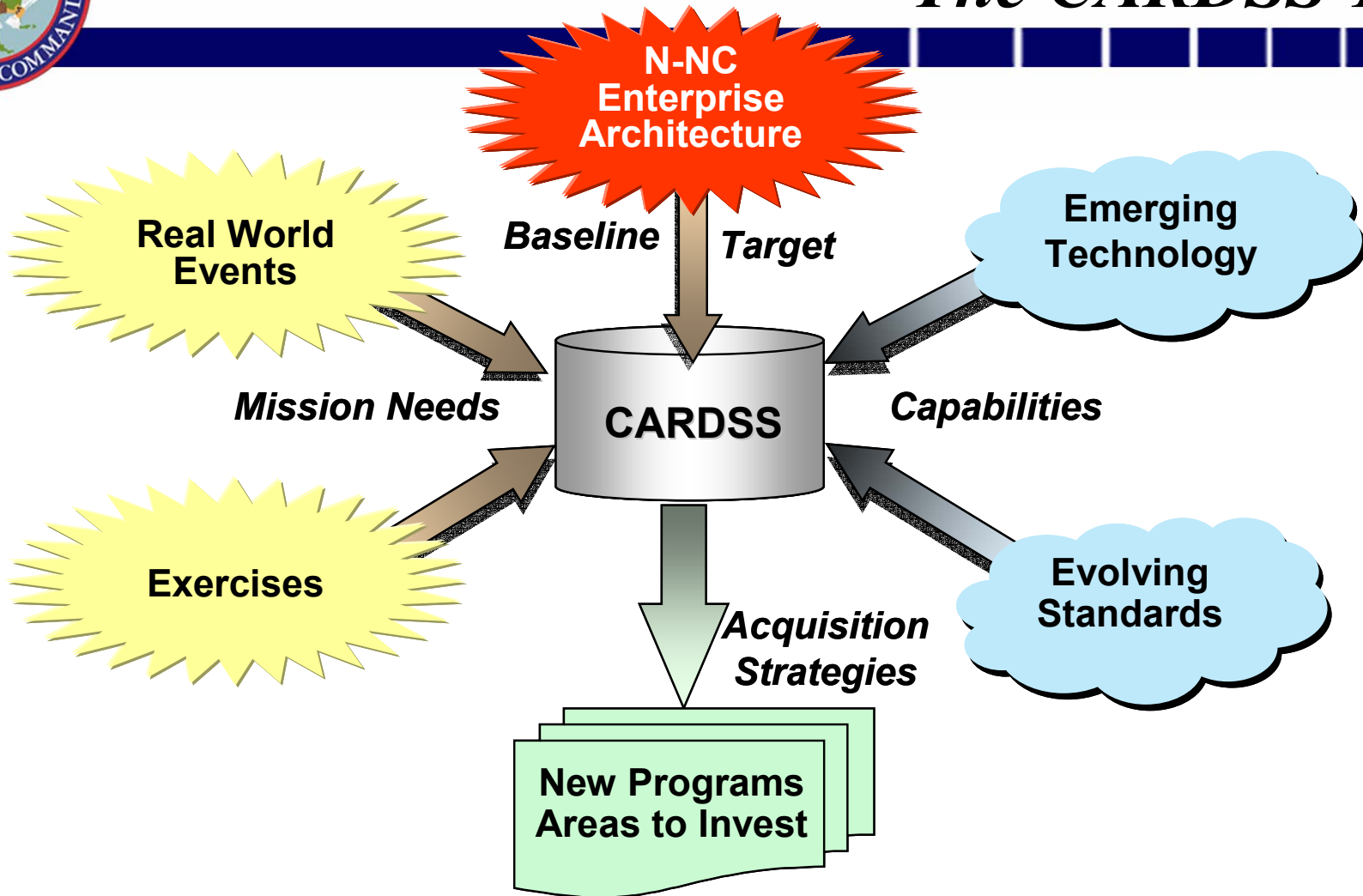


Projects, Spirals, Blocks, & Architecture



*Project development occurs in Spirals,
Upgrades occur in Blocks,
Target Architectures come from Block upgrade plans*

The CARDSS Tool



*Commands Architecture Repository and
Decision Support Source*

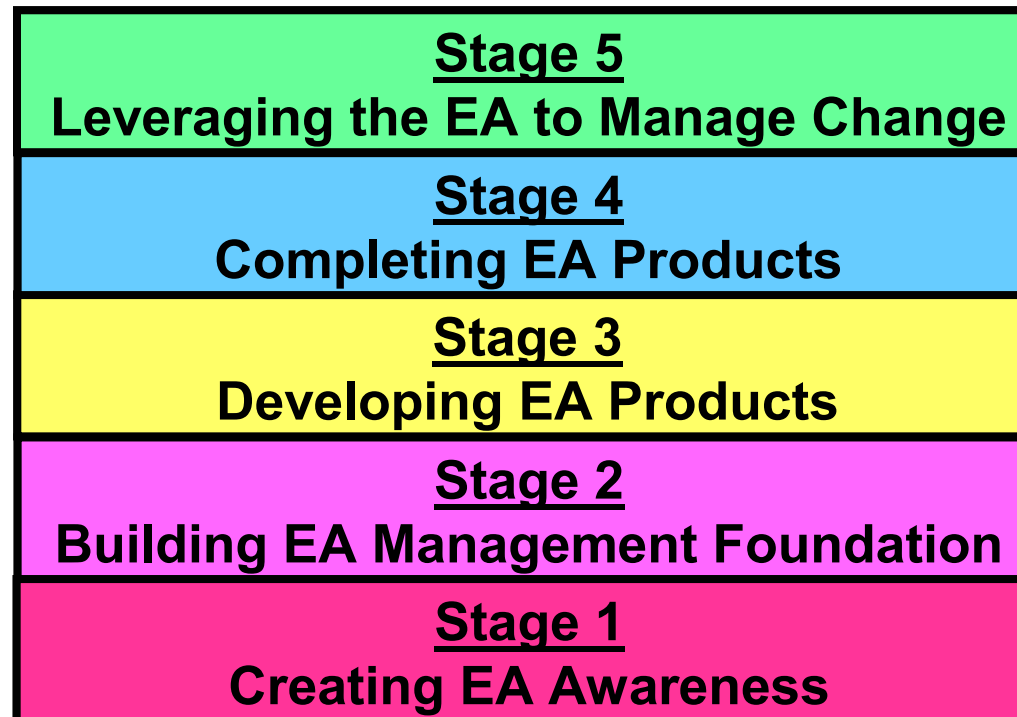
Assessing Progress



	Stage 1: Creating EA awareness	Stage 2: Building the EA management foundation	Stage 3: Developing EA products	Stage 4: Completing EA products	Stage 5: Leveraging the EA to manage change
Attribute 1: Demonstrates commitment		Adequate resources exist. Committee or group representing the enterprise is responsible for directing, overseeing, or approving EA.	Written and approved organization policy exists for EA development.	Written and approved organization policy exists for EA maintenance.	Written and approved organization policy exists for IT investment compliance with EA.
Attribute 2: Provides capability to meet commitment		Program office responsible for EA development and maintenance exists. Chief architect exists. EA is being developed using a framework, methodology, and automated tool.	EA products are under configuration management.	EA products and management processes undergo independent verification and validation.	Process exists to formally manage EA change. EA is integral component of IT investment management process.
Attribute 3: Demonstrates satisfaction of commitment		EA plans call for describing both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be." EA plans call for describing both the "as-is" and the "to-be" environments in terms of business, performance, information/data, application/service, and technology. EA plans call for business, performance, information/data, application/service, and technology descriptions to address security.	EA products describe or will describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be." Both the "as-is" and the "to-be" environments are described or will be described in terms of business, performance, information/data, application/service, and technology. Business, performance, information/data, application/service, and technology descriptions address security.	EA products describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be." Both the "as-is" and the "to-be" environments are described in terms of business, performance, information/data, application/service, and technology. Business, performance, information/data, application/service, and technology descriptions address security. Organization CIO has approved current version of EA. Committee or group representing the enterprise or the investment review board has approved current version of EA.	EA products are periodically updated. IT investments comply with EA. Organization head has approved current version of EA.
Attribute 4: Verifies satisfaction of commitment		EA plans call for developing metrics for measuring EA progress, quality, compliance, and return on investment.	Progress against EA plans is measured and reported.	Quality of EA products is measured and reported.	Return on EA investment is measured and reported. Compliance with EA is measured and reported.

maturation →

Source: GAO.



Using GAO's Enterprise Architecture Management Maturity Framework (EAMMF) to assess progress

EAMMF Assessment

As of 15 Aug 04

STAGE 1: Creating EA Awareness	STAGE 2: Building the EA Mgt Foundation	STAGE 3: Developing EA Products	STAGE 4: Completing EA Products	STAGE 5: Leveraging the EA to Lead Change
If an organization has plans to develop and use an architecture yet hasn't satisfied the criteria in stage 2, it is considered in stage 1.	1. Adequate resources exist	10. Written and approved organization policy exists for EA development.	16. Written and approved organization policy exists for EA maintenance.	24. Written and approved organization policy exists for IT investment compliance with EA.
	2. Committee or group representing the enterprise is responsible for directing, overseeing, or approving EA.	11. EA products are under configuration management	17. EA products and management processes undergo independent verification and validation.	25. Process exists to formally manage EA change.
	3. Program office responsible for EA development and maintenance exists.	12. EA products describe or will describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be."	18. EA products describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be."	26. EA is integral component of IT investment management process.
	4. Chief Architect exists.	13. Both the "as-is" and the "to-be" environments are described or will be described in terms of business, performance, information/data, application/service, and technology.	19. Both the "as-is" and the "to-be" environments are described in terms of business, performance, information/data, application/service, and technology.	27. EA products are periodically updated.
	5. EA is being developed using a framework, methodology, and automated tool.	14. Business, performance, information/data, application/service, and technology descriptions address or will address security.	20. Business, performance, information/data, application/service, and technology descriptions address security.	28. IT investments comply with EA.
	6. EA plans call for describing both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be."	15. Progress against EA plans is measured and reported.	21. Organization CIO has approved current version of EA.	29. Organization head has approved current version of EA.
	7. EA plans call for describing both the "as-is" and the "to-be" environments in terms of business, performance, information/data, application/service, and technology.		22. Committee or group representing the enterprise or the investment review board has approved current version of EA.	30. Return on EA investment is measured and reported.
	8. EA plans call for business, performance, information/data, application/service, and technology descriptions to address security.		23. Quality of EA products is measured and reported.	31. Compliance with EA is measured and reported.
	9. EA plans call for developing metrics for measuring EA progress, quality, compliance, and return on investment			

ELEMENT CRITERIA STATUS

	SATISFIED
	PARTIALLY SATISFIED
	NOT SATISFIED

Achieve Stage 5 by 30 September 2005 !!!!

