FSAM
Federal Segment Architecture Methodology

December 2008
Version 1.0

The Federal Segment Architecture Methodology (FSAM) is a step-by-step process for developing and using segment architectures that was developed by the Federal Segment Architecture Working Group (FSAWG), a collaborative tram of federal architects from ten federal agencies, the Office of Management and Budget (OMB) and two cross-agency architecture initiatives.

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FSAM Contributors

The Federal Segment Architecture Methodology (FSAM) was produced by the Federal Segment Architecture Working Group (FSAWG). The FSAWG was formed in January 2008 as a sub-team to the Architecture and Infrastructure Committee (AIC), a committee that reports to the Federal CIO Council. The FSAWG was formed at the request of the Chief Architect, from the Office of Management and Budget (OMB).

Over 50 volunteers representing government and industry contributed to the collaboration that produced the FSAM. This methodology represents   a significant accomplishment in moving segment architecture development towards a repeatable process in support of improving federal agencys' mission execution and service delivery to our citizens and business partners.

FSAWG Core Team Members:

The FSAWG consisted of the following voting members:

Government Core Team Member	Agency
Colleen Coggins (FSAWG Chair)	Department of the Interior (DOI)
Kshemendra Paul	Office of Management and Budget (OMB)
Rich VonBostel	Department of Justice (DOJ)
David Prompovitch	Department of Transportation (DOT)
Janet Gentry	Department of the Treasury (Treasury)
Walt Okon	Department of Defense (DoD)
Ken Clark	Representative from Program Manager for the Information Sharing Environment (PM-ISE)
Ylanda Ford	Housing and Urban Development (HUD)
Marlene Howze	Department of Labor (DOL)
Lisa Jenkins	Environmental Protection Agency (EPA)
Kunal Suryavanshi (contractor)	Office of Personnel Management – Human Resources Line of Business (HR-LOB)
John Teeter	Department of Health and Human Services (HHS)
Donna Roy	Department of Homeland Security (DHS)

FSAWG Sub-Team Members:

In addition to the FSAWG Core Team, a larger working team of staff members was established under the direction of the FSAM Core Team and met on a weekly basis. The FSAWG Sub-Team consisted of the following members:

Sub-Team Member	Agency	Contractor?
Suzanne Acar	DOI	
John Antlitz	HHS	
Graham Barrowman	HUD	Yes

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Emile Beshai	Treasury	
Tim Biggert	HR-LOB	Yes
Carrie Boyle	DOJ	Yes
Thomas Charuhas	DOI – National Park Service (NPS)	Yes
Kristi Coney	DoD	
Margot Delapp	DISA DoD	Yes
Cynthia Dittmar	DHS	Yes
Mark Gust	EPA	Yes
Adel Harris	DOI	Yes
Beverly Hacker	DOI	Yes
Ryan Kobb	HR-LOB	Yes
Shankar Krishnan	DOJ	Yes
Samuel Lampert	DOJ	Yes
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Pat McNaughton	DOL	Yes
Heather Miller	DOI	Yes
James Minier	Treasury	Yes
Mohan Prabandham	HR-LOB	Yes
John Reed	DOL	Yes
Diane Reeves	DOI	
Gail Reid	PM-ISE	Yes
Barbara Rice	DISA DoD	
Kenya Savage	PM-ISE	Yes
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Tom Smialowicz	OMB	Yes
Jerad Speigel	DOI	Yes
Rick Tucker	DoD	Yes
Laura Turbe	DOI	Yes
Todd Werts	DOL	Yes
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Federal Segment Architecture Methodology Overview

Background

In January 2008, the Federal Segment Architecture Working Group (FSAWG) was formed as a sub-team of the Federal CIO Council's Architecture and Infrastructure Committee (AIC). The FSAWG consists of federal agency architects who volunteered to leverage existing enterprise architecture (EA) best practices to develop a standard methodology for creating and using segment architectures. The FSAWG developed the Federal Segment Architecture Methodology (FSAM), a step-by-step process that includes best practices from across the federal EA community. The FSAM features easy-to-use templates that expedite architecture development and maximize architecture use. The FSAM includes step by step guidance based on business-driven, results-oriented architecture.

According to the Office of Management and Budget (OMB) Federal Enterprise Architecture (FEA) Practice Guidance, segment architecture is a "detailed results-oriented architecture (baseline and target) and a transition strategy for a portion or segment of the enterprise." The FSAM supports all three segment types as defined in the OMB FEA Practice Guidance: core mission area, business service, and enterprise service segments. According to the OMB FEA Practice Guidance:

> *A core mission area segment represents a unique service area defining the mission or purpose of the agency. Core mission areas are defined by the agency business model (e.g., tactical defense, air transportation, energy supply, pollution prevention and control, and emergency response).*

> *A business service segment includes common or shared business services supporting the core mission areas. Business services are defined by the agency business model and include the foundational mechanisms and back office services used to achieve the purpose of the agency (e.g., inspections and auditing, program monitoring, human resource management, and financial management).*

> *An enterprise service segment includes common or shared IT services supporting core mission areas and business services. Enterprise services are defined by the agency service model and include the applications and service components used to achieve the purpose of the agency (e.g., knowledge management, records management, mapping/GIS, business intelligence, and reporting).*

The FSAM consists of process steps for developing a core mission area segment architecture. The FSAM also includes guidance for tailoring the approach to develop business service and enterprise service segment architectures.

The FSAM is based on the principle that segment architecture development should be driven by segment leadership . FSAM is a scalable and repeatable process designed to help architects engage segment leaders to deliver value-added plans for improved mission delivery. Specifically, FSAM includes guidance to help architects establish clear relationships among strategic goals, detailed business / information management requirements, and measurable performance improvements within the segment. The FSAM helps architects ensure that a well constructed and defensible plan of action is developed in partnership with segment leaders.

The FSAWG members recognized that differences between individual segments and organizations would require FSAM to be flexible and extensible. The FSAWG members were careful to consider types of architectures as well as the need for agencies to develop and implement segment architectures that

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reflect their unique mission requirements and organizational cultures. Although the FSAM is prescriptive, it has been designed to allow organization and segment specific adaptations. For example, although templates are included in the FSAM, these templates can be modified or tailored to the specific needs of the organization or segment using the FSAM guidance. As a further benefit to architects, the FSAM provides suggested analytical techniques designed to conform to segment reporting requirements as identified by the OMB FEA Program Management Office (PMO).

Top-Level Overview of the FSAM

The FSAM top level consists of five process steps that help architects identify and validate the business need and scope of the architecture, define the performance improvement opportunities within the segment, and to define the target business, data, services, and technology architecture layers required to achieve the performance improvement opportunities. The FSAM process steps conclude with the creation of a modernization blueprint document that includes a transition sequencing plan for using and implementing the segment architecture. The top level FSAM process steps are shown in Figure 1.
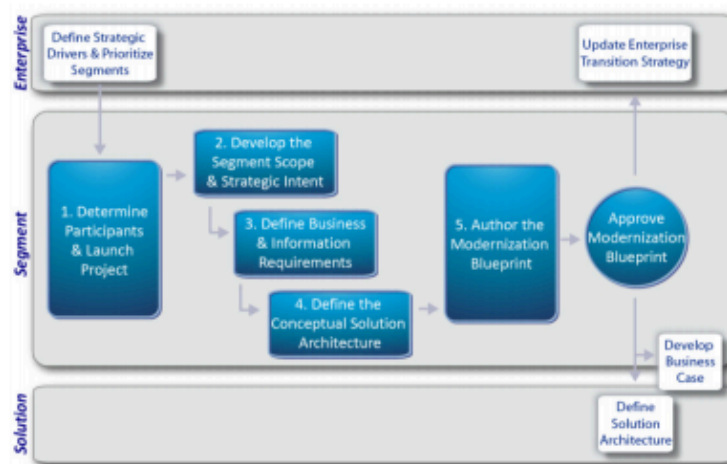

Figure 1: FSAM High-Level Overview

The OMB FEA Practice Guidance requires each agency to prioritize its segments and select a segment to architect. Once this is completed, the agency's architects can leverage the FSAM to work with segment leadership to assign executive sponsorship, ensure participation of business owners, and develop a business-owner-approved segment architecture blueprint. Each of the FSAM process steps is important in the development of a complete and actionable segment architecture. In order for the segment architecture to be "actionable", it must include specific, measurable milestones and deliverables that, once achieved, will lead to the targeted performance improvements. The five FSAM process steps are:

1. *Determine Participants and Launch the Project:* The architect leverages the guidance in this process step to engage with key stakeholders to establish the segment governance framework, validate the business owner(s) for the segment, formally appoint an executive sponsor and a core team, and establish the purpose statement to guide the architecture development. This

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process step also includes guidance for introducing a solid project management foundation for the segment architecture development effort with the creation of a project plan and communications strategy. Key questions addressed within this process step are similar to those that one might normally ask when initiating a project:

- o What is the governance framework for the development of the segment architecture?
- o Does the business owner(s) understand the process and time commitment for developing the segment architecture?
- o Who is the executive sponsor?
- o Who is on the core team? Are these the right people?
- o What is the specific purpose for developing this segment architecture?
- o Is the charter approved to develop the segment architecture in the context of the purpose statement crafted by the business owner(s)?
- o Is there a project plan and communications strategy for the development of the segment architecture?

2. *Define the Segment Scope and Strategic Intent:* The architect leverages the guidance in this process step to engage with key stakeholders to produce a segment scope and to define the strategic improvement opportunities for the segment. The architect then defines the segment *strategic intent* which consists of the target state vision, performance goals, and common / mission services and their target maturity levels. The subsequent FSAM process steps provide guidance for architects to align the architecture with the strategic intent to create a complete segment performance line-of-sight and to support achieving the target state vision. Key questions addressed within this process step include:

- o Based on the high-level problem statement, what are the strategic improvement opportunities and gaps?
- o What are the major common / mission services associated with the strategic improvement opportunities?
- o Who are the segment stakeholders and what are their needs?
- o What is the scope of the segment architecture?
- o What are the current segment investments, systems, and resources?
- o What are the deficiencies or inhibitors to success within the segment?
- o What is the target state vision for the segment?
- o What is the performance architecture for achieving the target state vision?

3. *Define Business and Information Requirements:* The architect leverages the guidance in this process step to engage with key stakeholders to analyze the segment business and information environments and determine the business and information improvement opportunities that will achieve the target performance architecture. Within this step, the architect begins with by developing a broad, holistic view of the overall business and information requirements associated with the strategic improvement opportunities identified in the previous step. Information requirements include the information exchanges that relate to the critical business processes associated with the performance improvement opportunities. The business and data

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architectures are derived from these requirements. The business and data architectures developed at the end of this step may include the specification of business and information services respectively, and should be sufficiently complete and actionable to result in more efficient processes and allocation of resources. Key questions addressed within this step include:

- o How well does the current (as-is) business and information environment meet the needs of the segment stakeholders?

- o How should the target business and information environment be designed?

- o Have the segment's goals and performance objectives been translated into actionable and realistic target business and data architectures expressed within business functions, business processes, and information requirements?

- o Have the business and information requirements been analyzed and documented to the lowest level of detail necessary to form actionable recommendations?

- o Did the business and information analysis provide a synchronized and cohesive set of recommendations?

- o Does the core team understand the adjustments that are required for the current business and information environments to fulfill the target performance architecture?

4. *Define the Conceptual Solution Architecture:* The architect leverages the guidance in this process step to engage with key stakeholders to produce the *conceptual solution architecture*. The conceptual solution architecture is an integrated view of the combined systems, services, and technology architectures that support the target performance, business, and data architectures developed in the preceding process steps. This process step also includes guidance for developing recommendations for transitioning from the current (as-is) state to the target state. The conceptual solution architecture produced at the end of this step is of benefit to segment and solution architects as well as to downstream capital planning and budget personnel. Key questions addressed within this step include:

- o What existing systems and services are deployed within the as-is conceptual solution architecture?

- o How well do the existing systems and services currently support the mission? Which systems and services should be considered for retirement and / or consolidation?

- o How should the target conceptual architecture be designed to fulfill the target performance architecture?

- o Are the selected target systems, components, and services reusable?

- o Does the conceptual solution architecture support the target performance, business, and data architectures developed in prior steps?

- o Have the dependencies, constraints, risks, and issues associated with the transition been analyzed to identify alternatives to be considered?

- o Are there existing external services (e.g. FTF services) that can be leveraged in the target architecture?

5. *Author the Modernization Blueprint:* The architect leverages outputs from previous process steps to engage with key stakeholders to create a segment architecture blueprint including

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5. Author the Modernization Blueprint: The architect leverages outputs from previous process steps to engage with key stakeholders to create a segment architecture blueprint including

sequencing and transition plans. The outcome of this process step is a series of validated implementation recommendations supported by holistic analysis of segment business, data, technology, systems, and service components. The modernization blueprint includes findings and recommendations as well as supporting artifacts and diagrams that illustrate the analysis performed throughout the architecture development process. For instance, artifacts such as the SWOT analysis and the conceptual solution architecture are key visuals in the modernization blueprint. Note that recommendations in the modernization blueprint typically span a strategic time horizon on the order of 3-5 years. Key questions addressed within this step include:

- o Have the strategic improvement opportunities from process step 2 been supported in the analysis, recommendations, and transition planning?

- o Have the findings from the previous process steps been identified, categorized, and prioritized?

- o Have the transition options been analyzed for costs, benefits, and risks in order to develop recommendations for implementation?

- o Are the recommendations clearly described in the blueprint?

- o Has the blueprint and sequencing plan been reviewed and approved by the executive sponsor, business owner(s), and core team?

The FSAM has been designed to assist architects as they develop and use actionable segment architectures. The outputs from the FSAM have also been designed specifically for use within other downstream processes, including investment management, enterprise transition planning, solution architecture development, and system lifecycle management.

Segment Sizing and Timing

The annual timing of segment architecture development is critical as the federal government has annual deadlines for capital planning and budget processes that impact the use and implementation of the architecture. Understanding a segment's size and complexity prior to beginning a segment architecture development effort can help the team determine the overall duration and level of effort expected. Such estimates also enable an agency's EA program to estimate the resources that may be required to support the development of a specific segment architecture. Table 1 provides an example of how an agency could determine the size and complexity of a specific segment.

Table 1: Segment Sizing Guide

Segment Evaluation Factors	Segment Size		
	Small	Medium	Large
Number of associated internal organizations / agencies	1	1-3	> 3
Number of associated external organizations / agencies	0-1	1-3	> 3
Number of service types within the segment	1-5	6-10	> 10
Number of major investments within the segment	1-2	2-5	> 5
Segment information technology (IT) budget as a percentage of overall agency annual IT budget	< 5%	5%-10%	>10%
Segment budget as a percentage of overall agency annual budget	< 1%	1%-2%	>2%

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Number of associated external organizations / agencies

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Number of service types within the segment

1-5 6-10 > 10

Number of major investments within the segment

1-2 2-5 > 5

Segment information technology (IT) budget as a percentage of overall agency annual IT budget

< 5% 5%-10% >10%

Segment budget as a percentage of overall agency annual budget

< 1% 1%-2% >2%

These segment sizing factors are not intended to be an exhaustive list but to be leveraged as a starting point for agencies in determining the anticipated level of effort when undertaking a segment architecture development. Table 2 provides potential target durations for architecting segments of different sizes and complexity (Steps 2 through 5). There is no exact science to determine segment size. Expert judgment and available historical information should be used when multiple categorizations are identified based on the recommended segment sizing factors. EA organizations should work to build their capabilities and optimize their efficiencies toward achieving these durations. Since Step 1 is associated with establishing the overall segment governance, the duration of this step is driven primarily by organizational complexity and is less dependent upon other segment-sizing parameters. Therefore, estimates of the time required to complete Step 1 are not provided as they can vary greatly, irrespective of segment size.

Table 2: Target Duration for Completing FSAM Steps

FSAM Step	Target Duration		
	Small	Medium	Large
Step 1	Step 1 duration depends on organizational complexity		
Step 2	2-4 wks	4-6 wks	6-8 wks
Step 3	2-6 wks	4-8 wks	6-10 wks
Step 4	2-6 wks	4-8 wks	6-10 wks
Step 5	2-4 wks	4-6 wks	6-8 wks
Total (Step 2 thru 5)	8-20 wks	16-28 wks	24-36 wks

Note: This table provides rough order of magnitude duration estimates for completing a segment architecture. The actual duration will depend on the availability of resources, the level of general EA and facilitation skills, and overall knowledge of FSAM. More accurate targets can be derived based on historical information and past performance from the organization's actual segment architecture development efforts.

Structure of the FSAM Guidance

The FSAM is structured with three levels of decomposition: process steps, activities, and tasks. The process steps, activities, and tasks are presented in an online toolkit containing guidance documents as well as analytical templates designed to expedite the development of segment architectures. Figure 2 shows an example of the three levels of decomposition, including the high-level process steps, activities a process step, and tasks within an activity.

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These segment sizing factors are not intended to be an exhaustive list but to be leveraged as a starting point for agencies in determining the anticipated level of effort when undertaking a segment architecture development. Table 2 provides potential target durations for architecting segments of different sizes and complexity (Steps 2 through 5). There is no exact science to determine segment size. Expert judgment and available historical information should be used when multiple categorizations are identified based on the recommended segment sizing factors. EA organizations should work to build their capabilities and optimize their efficiencies toward achieving these durations. Since Step 1 is associated with establishing the overall segment governance, the duration of this step is driven primarily by organizational complexity and is less dependent upon other segment-sizing parameters. Therefore, estimates of the time required to complete Step 1 are not provided as they can vary greatly, irrespective of segment size.

Table 2: Target Duration for Completing FSAM Steps

FSAM Step	Target Duration		
	Small	Medium	Large
Step 1	Step 1 duration depends on organizational complexity		
Step 2	2-4 wks	4-6 wks	6-8 wks
Step 3	2-6 wks	4-8 wks	6-10 wks
Step 4	2-6 wks	4-8 wks	6-10 wks
Step 5	2-4 wks	4-6 wks	6-8 wks
Total (Step 2 thru 5)	8-20 wks	16-28 wks	24-36 wks

Note: This table provides rough order of magnitude duration estimates for completing a segment architecture. The actual duration will depend on the availability of resources, the level of general EA and facilitation skills, and overall knowledge of FSAM. More accurate targets can be derived based on historical information and past performance from the organization's actual segment architecture development efforts.

Structure of the FSAM Guidance

The FSAM is structured with three levels of decomposition: process steps, activities, and tasks. The process steps, activities, and tasks are presented in an online toolkit containing guidance documents as well as analytical templates designed to expedite the development of segment architectures. Figure 2 shows an example of the three levels of decomposition, including the high-level process steps, activities a process step, and tasks within an activity.
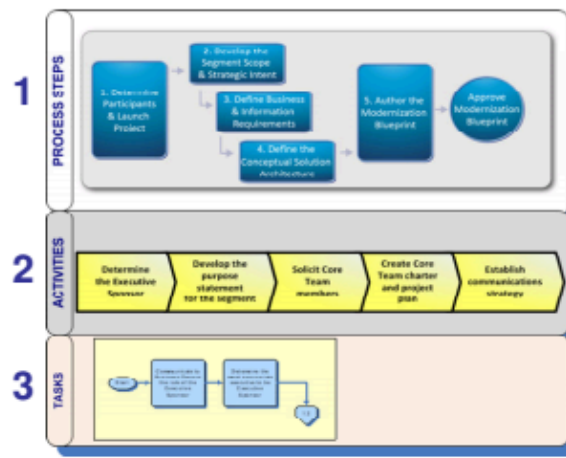
Figure 2: FSAM Process Steps, Activities, and Tasks

The FSAM guidance consists of five process step guidance documents that include detailed descriptions of the associated activities and tasks. The guidance documents follow a uniform structure that includes the elements described in Table 3.

Table 3: Structure of the FSAM Guidance Document

FSAM Guidance Document Element	Description
Step Description and Purpose	This section explains the overall purpose of the process step and provides an overview of the process step.
Step Outcome	The step outcome summarizes the overall expected result when the step is completed.
Step At-A-Glance	The step-at-a-glance is a summary table of the process step and associated activities, including the participants and stakeholders involved in each activity and the inputs and outputs for each activity. The table also highlights any touch points with other key documents, including National Institute of Standards and Technology (NIST) 800-39, the Federal Transition Framework (FTF), and Practical Guide to Federal Service Oriented Architecture (PGFSOA), as well as any associated Federal Enterprise Architecture (FEA) Profiles. The at-a-glance table also has links to key considerations for architects that are developing enterprise and business service segment architectures and an indication of the overall level of complexity of each activity.
Activity Details	Activity details provide a detailed description of each activity in the process step.
Activity Short Description	Each activity is explained in a short summary description.
Activity Flow Chart with Tasks	Each activity also has a task-level diagram that illustrates the relationship of the tasks within the activity.
Activity Inputs	Inputs are defined for each activity and represent information that should be available or collected before starting the activity. In many cases, inputs to a given activity correspond to the outputs of a preceding activity.
Tasks	A description of each task within the activity is provided.
Communication Considerations	Communication considerations include additional guidance related to key messaging associated with managing stakeholder expectations, gaining buy-in to recommendations, and other items for the architect to consider.

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Figure 2: FSAM Process Steps, Activities, and Tasks

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