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Technology Reference Model Update
IT Modernization Standards Profile

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This document has been developed in support of the Enterprise Architecture. Sections of this document may be updated as the project continues through the Enterprise Life Cycle. Iterations of the document and its subsections will be retained for historical purposes.

Revision History

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	Draft	12/31/05	EA Team
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Executive Summary

The Department of Housing and Urban Development (HUD) can continue to expect Information Technology (IT) to change at an increasingly rapid pace driven by technology trends and competitive differentiation between Commercial off the shelf (COTS) software products.

Component technology is constantly evolving; averaging about 10 months between new releases, and is generally unsupported by vendors after 3 subsequent releases. When added to the trend toward emergent (modernized) systems requirements and budget shortfalls, the pace of change places a high priority on software and systems engineering processes.

In order to properly execute transition plans and successfully meet the challenges facing the Department, HUD must maximize the effectiveness and efficiencies available through standardization for governing technology acquisition throughout the Department.

The key benefit of establishing standards is to simplify HUD's IT environment by promoting sharing and reuse of common technologies. All Modernization initiatives represent Enterprise **capabilities** to the Department and this paper documents a Standards Profile for each initiative.

The key benefits of Modernization's capabilities include:

- **Reuse** - allows HUD to share services across organizational and functional lines
- **Simplifies Investment Decisions** – developing capabilities based on specifications simplifies Segment Development by providing a complete set of services that provide a line of sight from strategy to business function to technology
- **Improves Program Performance** – eliminates duplicative investments and ensures applications and technology solutions are driven by business needs.
- **Improves Interoperability** - enables greater interoperability across disparate applications, both internal and external
- **Improves Utilization of Resources** – loosely couples logic from attendant technology and promotes platform and vendor independence
- **Accelerates System Implementation** – provides a architecture from which components with well-defined functionality can be chosen to implement business functionality

1 Introduction

1.1 Purpose

The HUD Technical Reference Model (TRM) provides a foundation to describe the standards, specifications, and technologies supporting HUD's IT Modernization efforts by ensuring secure delivery, exchange, and construction of HUD's business components.

The term "***component***" can describe a complete business line outsourced by HUD outside of HUD's environment, such as HIHRTS, a business service supporting business participation, an entire application or system to support Loan Processing, or a **capability** that may be accessed through a technology or business interface.

1.2 Scope

This document details the Standards Profile for each HUD Modernization initiative. These profiles focus on technology standards, specifications, and recommendations that embrace Services Oriented (SOA) and related approaches that create a sound foundation for the secure delivery and construction of Service Components and their interfaces

1.3 Approach

All standards are categorized by the FEA Technology Reference Model and the HUD established Configuration Change Management Board (CCMB) guidelines for technology governance.

For reference, the CCMB Technology Status guidelines are included in Appendix A of this document and for FEA standards, please refer to http://www.whitehouse.gov/omb/egov/a-1-fea.html.

2 Standards Profile

The HUD Standards Profile for IT Modernization is made up of Standards and Specifications and a Technology Profile. Federal Enterprise Architecture (FEA) classifies standards according to the following definitions:

- **Standards** - hardware, software, or specifications that are widely used and accepted (de facto), or are sanctioned by a standards organization (de jure)
- **Specifications -** a formal layout/blueprint/design of an application development model for developing distributed component-based architectures
- **Technology -** refers to a specific implementation of a standard within the context of a given specification

2.1 Standards/Specifications

The following define the standards for developing/integrating component-based multi-tier enterprise applications in the HUD environment.

- Java 2 Platform, Enterprise Edition (J2EE)
- Java 2 Platform, Standard Edition (J2SE)
- Java Servlet (JSR 53)
- Java Portlet API (JSR 168)
- Java Message Service (JMS)

The following standards and specifications are intended to provide a messaging framework for exchanging information in a decentralized, distributed environment.

- SOAP 1.1 (Note)
- SOAP 1.2 (Specification)
- Web Services Addressing
- Web Services Notification (WS-BrokeredNotification, WS-BaseNotification, WS-Topics
- Web Services Attachments Profile 1.0
- SOAP Message Transmission Optimization Mechanism

Using these security specifications, workflows can engage in secure communication designed to work with the general Web services framework.

- Web Services Federation Language
- WS-Federation: Active Requester Profile
- WS-Federation: Passive Requester Profile
- Web Services Provisioning
- Web Services Secure Conversation Language
- Web Services Security 1.0
- Web Services Security Addendum
- WS-Security Kerberos Binding
- Web Services Security Policy
- Web Services Trust
- Security Assertion Markup Language (SAML)

The focus of these specifications is the definition of a set of services supporting the description and discovery of businesses, organizations, and other Web services providers; the Web services they make available; and the technical interfaces which may be used to access those services.

- UDDI 3.0
- WSDL 1.1 (Note)
- WSDL 1.2 (Working draft)
- WSDL 2.0 (Working Group)

The objective of the Business Process specifications is to support business process management by both technical users and business users by providing a notation that is intuitive to business users yet able to represent complex process semantics. The specification also provides a mapping between the graphics of the notation to the underlying constructs of execution languages.

- Business Process Execution Language for Web Services V1.1
- Business Process Modeling Notation V1.0

2.2 Technology Profile

The following table establishes the products that comprise the solution set for IT Modernization initiatives. Select the Modernization initiative along the top row and the vertical matrices establish the technology pieces of the architecture.

Legend for Table 1 - IT Modernization Technology Profile

- ● - Approved Product (HUD Owned Licenses) Note[1]
- ◑ - Product provides capability (HUD Owned) Note [2]
- ○ - Candidate (License Not owned)
  - Note[1]: HUD owned Licenses may not provide sufficient capacity for Enterprise Development
  - Note[2]: Component parts of products that provide capability are not dependant on the selected technologies in the solution set and may utilize other technologies to cover their solution

Table 1 - IT Modernization Technology Profile

Technology	Product Component	Enterprise Portal	Enterprise Identity Management	Enterprise Tracking & Workflow	Enterprise Data Management	Enterprise Records Management	Enterprise Business Intelligence
Database/ Data Warehouse	Oracle Database Enterprise Edition		●		●	●	●
Middleware	Oracle Fusion Middleware		●		●		
Business Process Management	Oracle BPEL Server			○			
Business Intelligence	Microstrategy						●
Portal Server	Oracle Enterprise Portal	●					
Directory Server	Oracle Internet LDAP Directory	●	●				
Application Server	Oracle Application Server Enterprise Edition		●	●			
Content Management	EMC Documentum			◑		●	
Enterprise Applications	Peoplesoft (Financials, CRM etc…) ERP	◑		◑			◑

3 Next Steps

The HUD Target Enterprise Architecture (EA) must evolve to accurately capture and reflect new and changing influences, such as: process reengineering efforts, changes in goals and objectives; business drivers; compliance with rules, regulations, policies and procedures; and development of emerging technologies.

3.1 Obtain Approval for Standards

The HUD EA Team needs to obtain approval based on the recommendations in Appendix B from the appropriate governance body.

3.2 Update Target Architecture

Appendix A of this document is intended to replace the current Appendix J of the Target Architecture after standards are approved and when the target documentation is updated to Version 3.0.

3.3 Model Maintenance

Regardless of which EA tool is utilized, the EA team must collect, model and maintain the following information to improve the quality of IT Modernization. The maintenance of HUD's models facilitates EA compliance assessments and traceability for OMB 300 submission.

The following table summarizes the modeling and metadata requirements of Enterprise Architecture models. Phases are utilized to show priority and are based on ability of the organization to complete in a timely fashion. The legend below is used as an indication of status towards the completion of the tasks associated with Standards development.

Legend for Table 2 - EA Modeling Requirements

- ● - Completed *
- ◑ - Partially Complete
- ○ - Incomplete/Not Started

- *Note: Component Mappings may change as requirements evolve

Table 2 - EA Modeling Requirements

Phase I	
Map Components to key enabling technologies (Products) used in their implementation o Components are HUD Services, Applications, Capabilities) o Capture Component Lifecycle Status – (Design, etc …) o Map Component to Service Type (SCM) o Map Enterprise Initiatives to Components	◑

Obtain the following Product Information for HUD approved assets o Manufacturer o Product Name o Product Model o Product Version o Product Description o Manufacturer Part Number (Optional) o Supplier Part Number (Optional) o Standard Desktop Image (Y/N) o CCMB Status (Approved, Grandfather…etc) o Technology Maturity Status (Mature, emerging…etc) o License Model (per User or CPU) o License Scope (Enterprise/Separate/Single) o # HUD Owned Licenses o Capacity Metric (Optional) o Performance Metric (Optional)	◑
Categorize Products/Standards o Map to FEA Service Area/Category (TRM)	●

Phase II	
Map Products to H/W Service Platform (TRM) o HUD/HITS Platform ID (used to sync w/Vendor) o Vendor, Make & Model (Optional) o Operating System (maps back to a product) o Use – (Production, Test, Development etc…) o Cluster Component (Y/N) (Optional) o Cluster ID (Optional) o Location (Optional) o Form Factor (Standalone/Blade/Rackmount – 1U)	○
Map Component to Component Interfaces o Create Data Exchange Packages o Fill Package w/Data Entities	○

Phase III	
Capture Business Processes from Segment Architectures into EA Tool (Decomposed from Sub-Function to Functions, Processes, Activities & Steps)	○
Map Segment Functions, Process & Activities to Components	○

Map Initiatives to their Performance Objectives (PRM) and Goals	O
Map Requirements to Initiatives	O
Characterize Data by Function	O
Map Components to Data o Component to Data Entities ▪ Create, Update, Delete properties	O

3.4 Integrate Asset Management with EA

The information contained within HUD's many IT tools provide thorough documentation of the many services, capabilities and technologies that HUD applications and IT initiatives deliver. However, the information in these disparate sources currently has to be analyzed manually and needs to be integrated with the EA Tools in order to form cohesive views of the enterprise and facilitate expert assessment/analysis of technology insertion strategies.

The following summarize the steps involved:

- Centralize Configuration Management
- Integrate EA Toolset with IT Asset Management
- Integrate with hosting provider for improved reliability/visibility
- Define reports from Authoritative Source for Decision Making
    - o Impact Assessment
    - o Architecture Assessment

Appendix A – CCMB Technology Status

Approved - General Use
Approved by governing body for new investments / Developments should use this technology.

Approved – Grandfathered
The purpose of "Grandfathering" the use of older software by systems that had been put into operation prior to the implementation of the CCMB and the clearer delineation of platform standards is to protect those systems from being unfairly penalized in the various project review processes.

Limitations to Grandfathering approvals:
The grandfathering decisions related to the use of unapproved software are only valid for 18 months. At the end of that period, the systems should have migrated to approved software or the project leaders for systems using the unapproved software should return to the CCMB and explain why they haven't moved to standard software.

The grandfathering exemption only applies to the version of the software in use at the time of the decision. It is expected that the systems will be migrated to approved software products instead of to newer versions of the unapproved software. If the owners of a system want to move to a newer version of the unapproved software they must return to the CCMB and ask for specific permission to use a non-standard product. Approval is not guaranteed simply because of the prior grandfathering action.

If at a later date a more current version of the unapproved software is established as a standard, the grandfathering exemption expires. These systems will then be expected to migrate to the approved version of the software as soon as possible.

Approved-Non Standard Product
On occasion, the use of non-standard products is required by the special needs of a specific system or office. The request for approval of a non-standard product should be brought to the CCMB well in advance of the need for the product. Approval by the CCMB is not guaranteed and project leaders must allow time to explore other options if the request is denied.

Limitations to approvals of non-standard products:
The CCMB approval for the use of the non-standard products is normally limited to the system or office for which the original request was made. No other system or office may use the non-standard products without the specific approval of the CCMB.

The approval is only valid for the product versions specifically approved by the CCMB. If at a later time, the system owner or project leader wants to move to a later version, they must return to the CCMB to get specific approval to move to the newer version instead of migrating to an approved product.

Approved - Conditional

On occasion, the CCMB approves requests subject to certain conditions. These conditions will often require subsequent submissions to the board and the extent of the implementation of the products is normally limited until the conditions have been met. The extent of implementation permitted will be clearly spelled out by the CCMB.

The use of conditional approvals is normally intended to allow for:

- Further testing of a product before general implementation is authorized
- A small pilot to proceed that tests the general functionality of the product while important implementation issues are analyzed further
- A limited implementation of a current version of a product while waiting for the vendor to release a more desirable version. This is often the case when a web-based version is expected shortly, but the current desktop version is needed for immediate use by a small number of users.

The conditions of the approval will spell out:

- What actions may be taken immediately
- What actions are dependent upon completion of the further studies etc.
- When the CCMB expects the conditions to be met
- What reports etc. the CCMB expects to receive to verify that the conditions have been met
- The office and person responsible for seeing that the conditions are met and reporting back to the CCMB as required

If the conditions of the CCMB decision cannot be met within the timeframe established, the requesting office must return to the CCMB to explain the delay. At that time the CCMB may amend or cancel its original decision