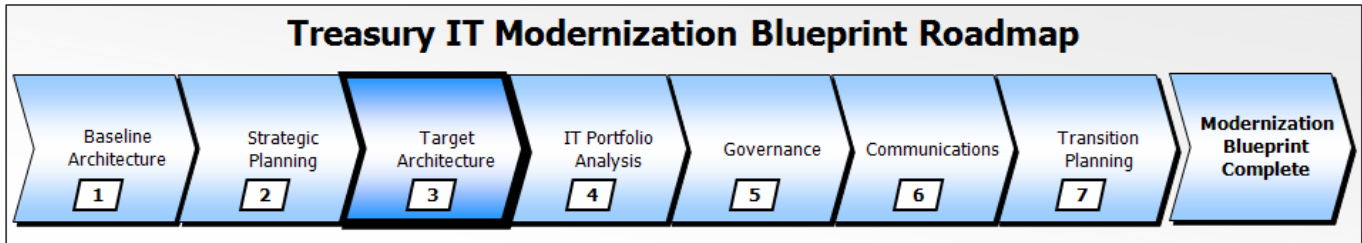


# U.S. Department of the Treasury

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## Treasury Technical Standards Profile

Standards and Configuration Management Team (SCMT) of the  
Treasury Enterprise Architecture Sub-Council (TEAC)

May 2007

U.S. Department of the Treasury  
Office of the Chief Information Officer

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**MESSAGE FROM THE TREASURY ENTERPRISE ARCHITECTURE SUB-COUNCIL  
(TEAC) CHAIR**

The Department of the Treasury is pleased to present its Technical Standards Profile. The technical standards described in the Profile comprise the core components of Treasury's Technology Architecture.

Treasury faces the challenge of developing an enterprise-wide Technology Architecture within the context of a federated business model. Unique requirements and needs arise from each Bureau and Office. Developing Department-wide technical standards and the processes and activities to maintain them requires careful planning and collaboration with all of Treasury's Bureaus and entities. This Technical Standards Profile describes Treasury's technical standards and the management processes leveraged to develop and refine them.

Treasury's Technical Standards Profile is both a listing of Treasury's Technical Standards and an interactive management tool for informing, maintaining, and ultimately achieving Treasury's Target Technology Architecture.



Lawrence Gross  
U.S. Department of the Treasury

Associate Chief Information Officer for E-Government  
Chair, Treasury Enterprise Architecture Sub-Council

## Revision History

### May 5, 2007 (Version 1.0)

- Initial release of the Technical Standards Profile.
- Version incorporates review and revision feedback from Treasury Enterprise Architecture sub-Council (TEAC) and Standards and Configuration Management Team (SCMT) members.

## 1. EXECUTIVE SUMMARY

The Treasury's Technical Standards Profile describes the Treasury Enterprise Architecture Sub-Council's (TEAC) approved standards for each service area of Treasury's Technical Reference Model (TRM). These standards were adopted to encourage and enable enterprise-wide interoperability, information exchange, and accessibility across Treasury and to extend to business partners, stakeholders, and the public.

These standards were developed for the following four TRM Service Areas and are fully documented in Section 7:

- Service Access and Delivery
- Service Platform and Infrastructure
- Component Framework
- Service Interface and Integration

The TRM is a component-driven, technical framework categorizing the standards and technologies to support and enable the delivery of Service Components and capabilities. It also unifies existing agency technical reference models and E-Government guidance providing a foundation to advance the reuse and standardization of technology through an established technical architecture

The objectives/drivers for creating this profile are to:

- Define usable technical standards across the Agency to improve collaboration in IT procurement and development of services between Bureaus
- Promote Department-wide identification and utility of the IT standards
- Meet Office of Management and Budget (OMB) Circular A-130 requirements, for a viable TRM of services and associated IT standards
- Assist managers, planners, and developers in the procurement of standard information technology products or services.

The party responsible for producing this document is the Standards and Configuration Management Team (SCMT), an integrated project team (IPT) chartered by the TEAC. The SCMT is comprised of individuals from all Bureaus within the Department of the Treasury; members are identified in Section 3. The SCMT relies upon the guidance of subject matter experts throughout the Department, other government agencies, and IT industry organizations.

The change management process developed by the SCMT enables updates to the standards profile and will occur as the SCMT identifies changes published by official

standards bodies or receives official change requests from its customers. This document and subsequent updates reside on the Treasury intranet within the SCMT standards repository (located at the TEAC site).

## **2. FOREWORD: ONE TREASURY ENTERPRISE VISION**

As the demand for new information technology increases, so must the pace for standardizing these technologies. Successful standards result in compatible, interoperable, and integrated systems to support operations throughout the Department of the Treasury. In order to achieve this goal, the Treasury must bring together standards applicable to its operations from many sources. This methodology is in direct support of the Treasury's mission and vision as stated in the Treasury's IT Strategic Plan:

**IT Mission:** "To enable the mission of Treasury and to leverage information technology to steward services for citizens, government, and industry "

**IT Vision:** "Information technology that is secure; accessible; adds value across the enterprise; and exceeds customer expectations."

Office of Management and Budget (OMB) Circular A-130 requires that business needs justify technology. Our technical standards must accommodate the widest possible range of missions and scenarios by allowing users to enter the infrastructure at any time, any place, while protecting the privacy of individuals. Communications among Treasury Bureaus, other government agencies, standards bodies, and the public are vital to the successful implementation and application of IT standards and adherence to the Treasury IT Mission and Vision.

Our Treasury enterprise is a coalition of Bureaus that collaborate to meet shared challenges while retaining the individuality that enables each one to accomplish its specialized mission. The Treasury technical standards, in part, are intended to help move us all toward a unified Treasury.

## **3. ACKNOWLEDGEMENTS**

A viable standards program relies on a broad base of participation and expert advice from many sources within government and the private sector. This initial standards profile was developed from a diverse confederation of Treasury Bureaus, business and IT stakeholders; federal agencies and advisors; and business partners and subject matter experts in the industry. The SCMT will maintain contact with official standards bodies to stay informed of changes and rely upon the guidance of subject matter experts throughout the Department as well as from other government, private and industry organizations. The individuals listed below provided information, advice, and comments that contributed to the initial baseline of standards presented in the Treasury Technical Standards Profile.

<b>Name</b>	<b>Organization</b>	<b>Role</b>
Elliott Sofidiya	Bureau of Engraving and Printing	Chair
Phillip Perry	Departmental Offices	Co-Chair
Joe Kordella	Bureau of the Public Debt	Charter Member
Marlene Stringfellow	Financial Management Service	Charter Member
Gbemi Acholonu	Internal Revenue Service	Charter Member
Wilma Figueroa	Treasury Inspector General for Tax Administration	Charter Member
Atacan Donmez	Departmental Offices	Charter Member
Sukesh Kohli	Internal Revenue Service	Charter Member
Ajay Budhraj	Treasury OCIO EA Program	Charter Member
Rosemarie Perez	Treasury OCIO EA Program	Charter Member
Donna Wessel	Departmental Offices	Charter Member
Gary Allmond	Departmental Offices	Charter Member
Chip Walsh	Internal Revenue Service	Charter Member
Gayle Bracy	Treasury OCIO Policy and Planning	Champion
Lawrence Gross	Treasury OCIO E-Government	Champion and Sponsor
Beverly Hacker	Treasury OCIO Chief Architect	Champion
Robert Ruyak	Treasury OCIO EA Program	Facilitator
Rorik Ebbesen	Treasury OCIO EA Program	Facilitator
Anthony Monas	Treasury OCIO EA Program	Facilitator

#### **4. INTRODUCTION**

Driving each Federal agency's transition from a government-centric to citizen-centric business ideology is enterprise architecture (EA). As agencies struggle to understand and manage the relationship between their business and information technology (IT), EA is playing a major role in bridging that gap. Following the guidance of the Office of Management and Budget (OMB), General Accountability Office (GAO), the President's Management Agenda (PMA), and other regulatory government agencies, Federal institutions are looking to modernize their business by establishing and implementing an EA framework.

The Department of the Treasury's Standards and Configuration Management Team (SCMT) is responsible for the technical standards that align to the technical architecture of the Treasury's EA framework. The SCMT has collaboratively developed the technical standards that are discussed in this document. These standards guide decisions related to IT investment alignment, planning, and procurement.

The Treasury SCMT, established in FY2006, provides the foundations, baseline analysis, guidance, and vision to guide the Department's technical standards development efforts. The SCMT is the governing body that centrally leads, manages, integrates, and coordinates efforts to identify and implement technical standards to support the Treasury enterprise as a whole.

The technical standards presented in this document represent a Department-wide effort and consensus on the standards supporting the Department's Technical

Architecture. The standards represent the foundation on which the Treasury target architecture can be constructed to achieve interoperability Department-wide and extended to business partners, stakeholders, and the public.

#### **4.1. Goals, Objectives, and Benefits**

The SCMT has identified a number of goals, objectives, and benefits related to the establishment of a Treasury-wide technical standards list.

##### **Goals**

The primary goals of establishing a Treasury-wide Technical Standards list are to:

- Provide Treasury cost savings via elimination or consolidation of duplicative processes, systems, and/or technologies, and improved integration.
- Provide interoperability between processes, systems, Bureaus, and agencies
- Improve consistency, accuracy, timeliness of information shared across the enterprise.

These goals are consistent with the OMB direction, the Treasury IT Strategic Plan, and Business Strategic Plan.

##### **Objectives**

To comply with OMB guidance with technical standards development, the Department must establish that the Treasury technical standards are consistent with the OMB Federal Enterprise Architecture Model (FEA); ensuring continual information sharing through a common vocabulary and framework. Following this ideal, this document was developed with these objectives in mind:

- Ensure that the Department meets the requirements set forth in OMB Circular A-130, which calls for a viable TRM of services and set of IT standards to support the TRM.
- Provide the management, integration, coordination, and collaboration to promote Department-wide participation and consensus in the IT standards adoption and retirement process to maintain a viable set of actionable IT standards.
- Assist managers, planners, IT professionals, those involved with procuring information technology products or services, and other interested parties in making informed judgments when choosing specifications to meet current and planned requirements.

## Benefits

There are a number of benefits that will be realized as a result of developing an enterprise-wide technical standards list. These benefits will be recognized through the implementation of an EA driven portfolio management process that requires IT investment alignment to the developed technical standards list, resulting in improved IT investment management and procurement. In essence, new systems will be designed to be flexible enough to evolve with changing business and industry trends and functional and technological requirements. Each of these benefits is described below:

- Improved integration between strategic business goals and IT functions will be realized, affording Treasury a better understanding of how IT supports the Department's overall business strategy (e.g., simplified interoperability of IT investments through common technologies/standards).
- The reuse of technology is a key benefit to the creation and use of a technical standards list. Aligning agency capital investments to the TRM leverages a common, standardized vocabulary, allowing interagency discovery, collaboration, and interoperability of technologies and standards. Agencies and the federal government will benefit from economies of scale by identifying and reusing the best solutions and technologies to support their business functions, mission, and target architecture.
- Strategic sourcing is another benefit associated with an established enterprise-wide technical standards list. Integrating a technical standards list with the SmartBUY initiative will enable the Treasury to realize the benefits associated with coordinated bulk technology purchases for the Department.

## 4.2. Scope

This Technical Standards Profile integrates international, national, federal, industry, and other standards to provide an open systems environment with the functionality necessary to meet the Department's broad range of mission requirements. These standards have been categorized based on the FEA TRM and are categorized in this document based on Service Areas. Each technical standard listed within the service areas below represent the result of intensive Department-wide assessment and review to verify, update, replace, and retire standards.

This document will evolve through Department-wide participation in the ongoing technical standards approval process. Ongoing adoptions, updates, and retirements of standards listed in this Profile will be reflected in the published version of this standards profile which will be hosted on the Treasury intranet within the SCMT standards repository. Additional information, including policy, publications, and the standards repository, will be published to the SCMT section of the TEAC intranet site.



### **4.3. System of Record**

The Department of Treasury has built an Enterprise Repository for Enterprise Architecture and related areas using the tool Metis. Metis is a client-server tool that provides a platform for decision support, analysis, standards compliance and communication. The Clinger-Cohen Information Technology Management Reform Act of 1996 section 5125 requires that agencies develop a sound and integrated information technology architecture. The Enterprise Repository provides assistance in the development of effective management processes and procedures for IT resources, helps us achieve the Green status rating for Enterprise Architecture and promotes the definition, specification and effective use of Treasury standards. The Enterprise Repository also improves return on investment, eliminates redundancy, improves decision making and promotes reuse.

The current deployment of the Repository has addressed the configuration of an initial operating capability supporting department and Bureau-level modeling needs. This effort included population of Enterprise Architecture models with a scoped set of existing Treasury information (FEA reference model taxonomy and IT asset information), and it enhanced the Treasury Department's ability to satisfy Office of Management and Budget Enterprise Architecture assessment criteria and support the "Proud to Be" program by improving internal management controls through increased visibility of IT applications. Treasury plans to build the Repository further to implement the business and technical structures necessary to enable Treasury to meet OMB compliance specifications, extract business value through use of the Repository, and sustain the relevant information over the long term. The implementation of the linkage between the repository content and the technology standards defined by the SCMT will enable decision makers to search for existing assets that support specific standards and to procure new IT assets that support those standards. This information will promote standards compliance in the organization, reduce redundancy and provide better integration between IT systems. The Enterprise Repository will leverage the SCMT standards and make them operational so that users can get accurate information about key areas and make effective decisions based on impact assessments.

## **5. TREASURY TECHNICAL STANDARDS INITIATIVES**

As this is the first major effort to establish enterprise-wide technical standards at the Department of Treasury, collaboration amongst Bureaus is critical to the success of the technical standards initiative. The SCMT was formed with the specific purpose of addressing numerous and ongoing business/information technology alignment decisions as they relate to architecture, development, and procurement of technical services, products, and systems. The SCMT uses the FEA framework to communicate the technical standards.

### **5.1. Purpose**

The OMB Circular A-130 requires that technology justify business needs. The objective, now and in the long-term, of the SCMT is to provide standards for an information architecture that can accommodate the widest possible range of

missions and scenarios by allowing users to enter the infrastructure at any time, any place, while protecting the privacy of individuals. Communications among Treasury Bureaus, other government agencies, standards bodies, and the public are vital to the successful implementation and application of IT standards and adherence to the Treasury IT Mission and Vision.

The Profile specifies the set of voluntary IT standards proposed to enable enterprise-wide interoperability, information exchange and accessibility across Treasury. These standards are categorized into service areas that align with the Technical Reference Model as specified by OMB Circular A-130 and modified by Treasury. This Profile provides guidance on the use of each standard. As the Departmental information architecture evolves, the SCMT will continue to respond as follows.

- Facilitate the Department-wide use of a consistent set of IT standards.
- Provide mechanisms for tracking, adopting, and promulgating emerging IT standards to be included in future versions of the Profile.
- Conduct sunset reviews to continually update and refresh IT standards.
- Automate the Treasury IT standards processes, to the extent possible, to expedite coordination and distribution of standards and guidance.
- Foster broad participation by Treasury stakeholders in voluntary standards bodies.

The Treasury Technical Standards Profile is intended to be a dynamic component of the enterprise architecture planning and development process that may serve as a valuable and integral tool for adopting and implementing new and effective IT standards across Treasury in support of strategic mission and business requirements.

## **5.2. Business and Architecture Drivers**

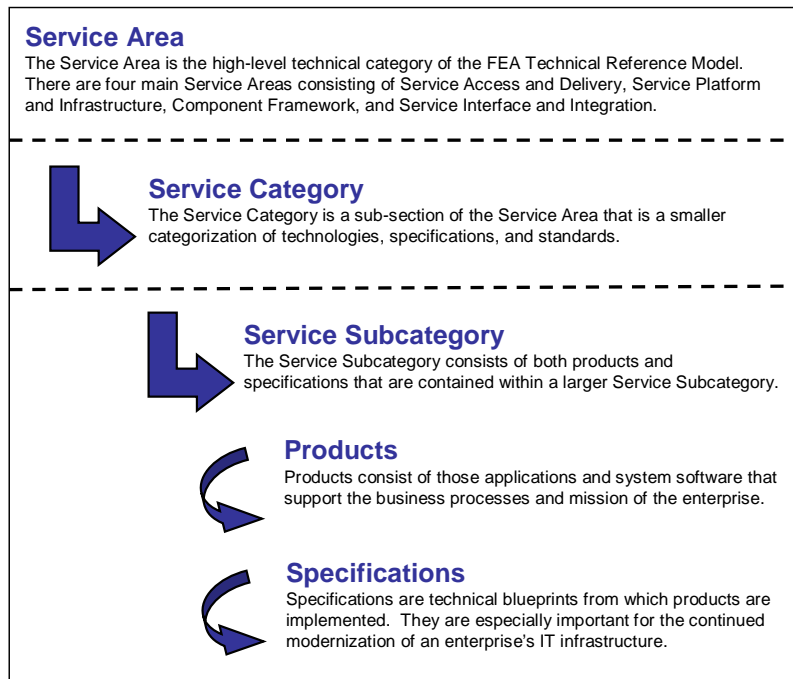
The major drivers include the IT Strategic Plan and the OMB EA Assessment Framework. The SCMT is working towards defining a usable technical standards list across the Department to improve the efficiency and effectiveness of each dollar spent towards IT within the Department and across agencies. This technical standards list's structure is based off of the Federal Enterprise Architecture (FEA) Technical Reference Model (TRM) and contains custom extensions specific to Treasury. Appendix A provides a list of references for the regulatory and legislative bodies that are driving the push for the development of enterprise-wide technical standards within agencies.

A list of additional drivers, both business and architectural, is listed in Appendix A.

### 5.3. Leveraging the Federal Enterprise Architecture (FEA) Framework

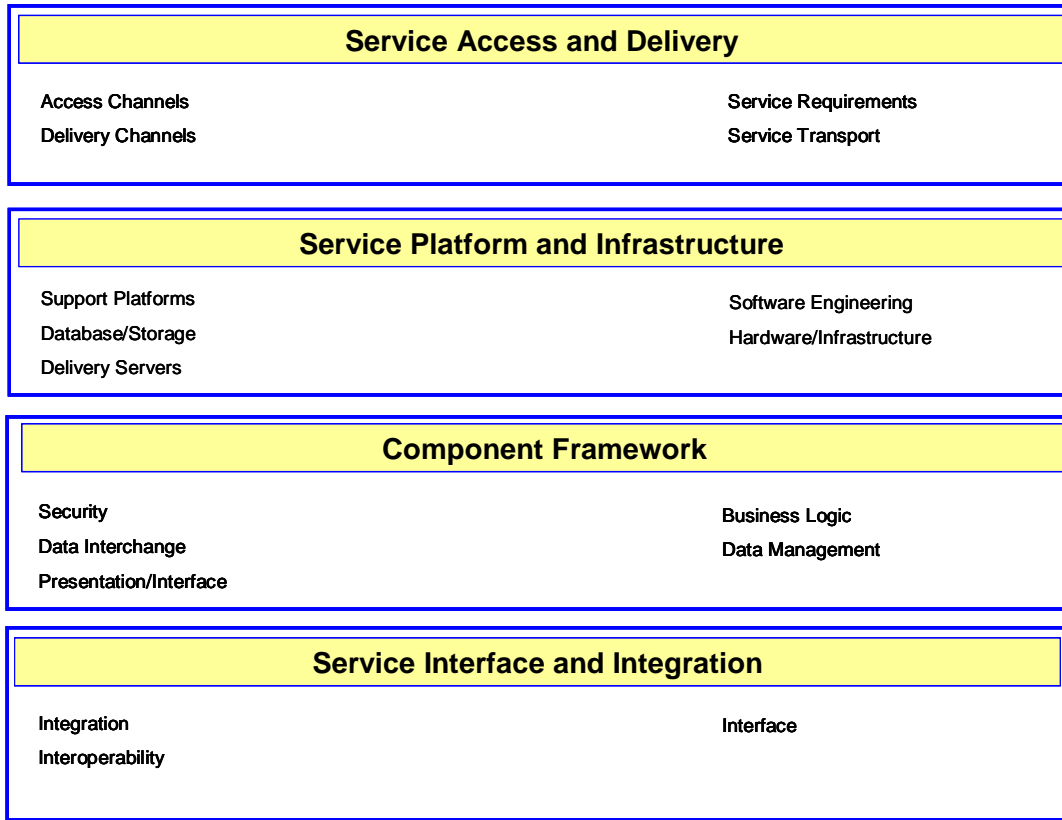
The Treasury’s current Target TRM is displayed in Figure 1 below. The Product and Specification extensions of the Sub-category level are unique to Treasury and are further discussed in the most current version of Treasury’s Target Technical Architecture document.

**Figure 1: Treasury Technical Reference Model (TRM)**



To further expand up the Target Treasury TRM Service Areas, Figure 2 below lists the Service Categories that are contained within each Service Area. The baseline Treasury preferred standards list has been developed using this schema.

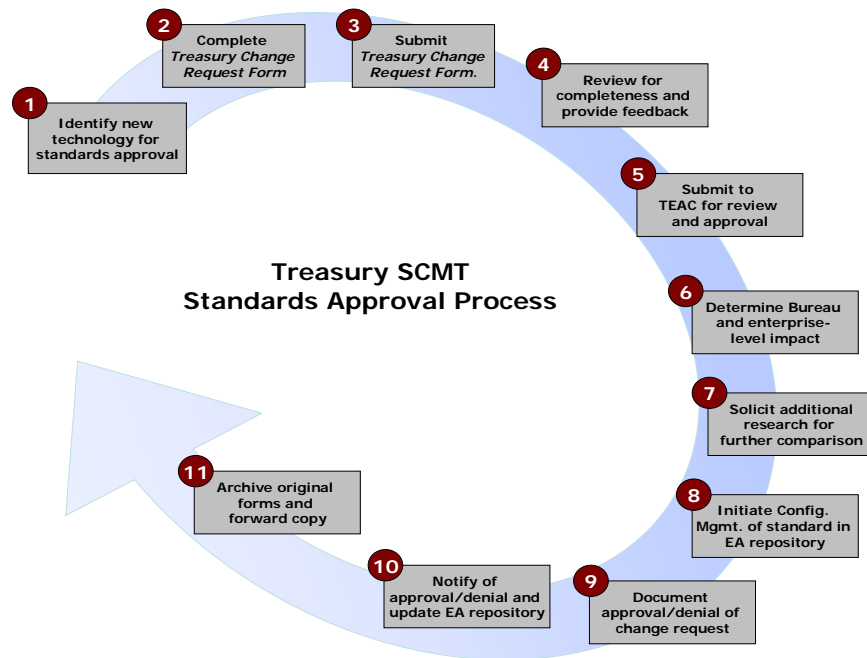
**Figure 2: Treasury TRM Overview**



## 6. TECHNICAL STANDARDS ADOPTION PROCESS

When the SCMT was first initiated, its initial task was to develop a repeatable process for approving and defining technical standards. This process has been captured in Figure 3, and further explained in the numbered bullets below.

Figure 3: SCMT Standards Approval Process



1. The Requestor identifies the software or technology that is required to improve current business processes, functions, or the computing environment or identifies the need to extend the use of existing software or technology beyond the Phase Out date.
2. The Requestor completes the *Treasury Technical Standards Change Request Form* for the requested software, specification, or technology. The Requestor must include a justification and/or business case within Section B while including a Phase Out date for the requested standard. If the change request disallows other current requirements (security, etc.) to not be met, then the Requestor must complete the *Treasury Technical Standards Request for Waiver Form*.
3. The Requestor submits the completed *Treasury Technical Standards Change Request Form* to his/her Bureau level representative, CIO, or Chief Architect. Upon review, the representative signs and submits the form, with all supporting documentation, to the SCMT.
4. The SCMT reviews the submitted *Treasury Technical Standards Change Request Form* and determines whether the request is complete. If incomplete the SCMT may contact the requestor to obtain additional information and present feedback.

5. All recommendations for the change request to be approved are submitted to the TEAC for review and approval. The status of all change requests and standards approval will be accessible via an online website.
6. The TEAC will determine the impact of the change request on the existing Bureau Enterprise Architectures. If it is determined that a waiver must be issued for but not limited to security or performance requirements, the affected Bureau representative will be asked to submit the *Treasury Technical Standards Request For Waiver Form*.
7. The TEAC will also determine whether the information is sufficient to make a proposal to the CIO Council. If the TEAC determines that the information is insufficient, the TEAC will request that additional research be conducted to compare the technology with other technologies of similar capability. The TEAC will assign an appropriate individual to conduct the market research. The requester, or designate, will present the findings along with the completed research to the TEAC for review and consideration.
8. Upon review by the TEAC the SCMT engages a configuration management process for standards through the Metis EA repository tool. The corresponding Metis model containing the FEA TRM taxonomy is updated to include the requested software, specification, or technology and a Control Number is assigned. The Control Number will be used for tracking the request through the TEAC, SCMT, and CIO Council.
9. The reason(s) for approval/denial of both change and waiver requests is documented by the CIO Council on the respective forms. A designated TEAC, SCMT, CIO Council member, and Bureau CIO must sign each form authorizing recommended approval.
10. The SCMT notifies the Requestor of approval/disapproval and updates the Technical Reference Model (TRM) within the enterprise repository tool.
11. The SCMT maintains the original *Treasury Technical Standards Change Request Form* and/or *Treasury Technical Standards Request for Waiver Form* and forwards a copy to the requestor/user.

## 6.1. Rules

Any rules specific to the development of the Treasury's Technical Standards can be found in the SCMT charter. This charter explains the roles, responsibilities, and general information of the SCMT and is actively adhered to.

## 6.2. Criteria

General decision criterion was created during the development of the approval process. Each of the decision criterion and its supporting rationale are described in Figure 4 below.

**Figure 4: Decision Criterion**

### Decision 1

**Criterion:** Must meet the organization's requirements and business drivers/goals

**Rationale:** A standard must meet business requirements and not be based on technological advancement alone. A business need for cost-savings would drive the adoption of certain standards that may allow for integrating existing systems to implement the solution. The standard messaging solution, for example, would not be based solely on whether it's the latest, innovative solution, but on the functionality and availability of the standard. In addition, Treasury should develop standards for those elements of the technical infrastructure that affect all Bureaus. Standardization should not happen for its own sake but because it makes good business and technical sense for each of the Bureaus. The enterprise standard should represent a lowest common denominator for shared capabilities below which all Bureaus agree not to fall.

### Decision 2

**Criterion:** Must meet federal mandates

- Includes: Section 508, IPv6, and other mandates
- May include certification or internationalization, as appropriate

**Rationale:** A standard must meet all federal mandates in order to align with congressional goals and allow for smoother transitions for future modernization activities. Treasury should decline to implement a "best practice" or other "guidance" even though it may outweigh a federal mandate. For example, the Section 508 mandate must be adhered to in order for agencies to provide access to all individuals.

### Decision 3

**Criterion:** Should be a publicly available specification and developed and approved through a public standards body

**Rationale:** A standard's specification should be publicly available to ensure transparency. There should be no questions regarding the origin, contributors, and availability of each standard. The use of open, public, specifications ensure integration with other systems adhering to those specifications. In addition, standards should originate from both well-known standards bodies made up of

representatives from various industries and experience and a significant number of vendor representatives who have a variety of divergent interests This will ensure that the appropriate people are constructing the most relevant and agreed upon problem solving methods. The standard must have been created by one of the body's referenced on the NSSN.org site or by one of the following:

- [Accellera](#)
- [ASTM International](#)
- [AUTOSAR](#)
- [BIPM](#), [CGPM](#), and [CIPM](#)
- [CableLabs](#)
- [Ecma International](#)
- [Liberty Alliance](#)
- [FAI](#)
- [GGF](#)
- [GS1](#)
- [IBTA](#)
- [IEC](#)
- [IEEE](#)
- [N3P](#)
- [IETF](#)
- [ISO](#)
- [ITU](#)
- [ITU-R](#)
- [ITU-T](#)
- [ITU-D](#)
- [OASIS](#)

**Decision 4**

<b>Criterion:</b>	Should be stable and supported by a range of readily available products, technologies, specifications <ul style="list-style-type: none"> <li>• Includes cost and viability to the organization</li> <li>• Example: Financial impact of LDAP vs. X.500</li> </ul>
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**Rationale:** A standard should be implemented by a host of available products on the market, including both open-source or proprietary vendor solutions. It should be stable and not an unproven new specification without proper vendor support. There should be enough products that implement a protocol available in the marketplace to avoid being "locked in" to a single vendor. Adopting a brand new specification can incur unnecessary risks to the operating environment.

**Decision 5**

<b>Criterion:</b>	Should be well understood, mature technology <ul style="list-style-type: none"> <li>• Should be in final stage, not alpha or beta</li> </ul>
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**Rationale:** A standard should be open, available, and have gone through multiple revisions for maturity. This will ensure stability and bug fixes. Furthermore, "well-understood" and "mature" would be



assessed by each Bureau in accordance with its own perceptions. This determination applies to both products as well as underlying specification(s).

**Decision 6**

<b>Criterion:</b>	Should be testable, so that components or products can be checked for conformance <ul style="list-style-type: none"> <li>• Certification and standards compliance through vendor</li> </ul>
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**Rationale:** A standard must have test suites so that all products that implement the specifications can be certified to have implemented them correctly. This ensures more flexibility in procurement decisions around certified products. This will not always apply to those open source products that can't afford expensive test suites for certification. Further internal review and possible testing may have to be conducted to ensure compliance with the specification. A Bureau may use whatever evidence of testing it regards as necessary or sufficient to establish confidence in that product or specification.

**Decision 7**

<b>Criterion:</b>	Should support internationalization
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**Rationale:** A specification must have the facility to support multiple languages and character sets to adapt to citizen and employee needs if a Bureau determines that a business case supports it. This will ensure further flexibility in the system support for various stakeholders. Any internationalization mandates must be adhered to as well in order for the federal government as a whole to ensure that citizens of different linguistic origin can fully understand federal benefits, laws, etc.

**Decision 8**

<b>Criterion:</b>	Should not introduce any regressions that would have serious implications/limitations for ongoing support of an organization's environment <ul style="list-style-type: none"> <li>• Emphasis on interoperability</li> </ul>
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**Rationale:** A standard should not introduce regressions in the overall operating and business environment once it is deployed. Various systems will be required to be shutdown and migrated, but the supported business should not change due to the introduction of a new standard.

**Decision 9**

<b>Criterion:</b>	Should be in wide use, i.e. de facto standard
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**Rationale:** A standard should be in wide-use and implemented across the industry. It's important to determine what specifications others are implementing so that the agency can ensure compatibility with other technologies and organizations.

## 7. TECHNICAL STANDARDS

The Treasury Technical Standards Profile is organized into four information technology architecture service areas, reflecting the components of the Technical Reference Model (TRM) necessary to build a complete technical infrastructure. The Standards Profile reflects the initial baseline standards currently adopted in each of these areas. The Standards Approval Process provides the vehicle for continually refreshing the standards in each service area. The sunset review provides an overall review of standards and an opportunity to set future direction. Service areas can be re-defined as the standards process evolves. The most important consideration is the need to accurately reflect information technology (IT) standards that support current requirements and future trends in defining the Department's IT architecture.

### 7.1. Service Access and Delivery

As stated by the Federal Enterprise Architecture (FEA) in the FY07 Consolidated Reference Model, "the Service Access and Delivery Service Area defines the collection of Access and Delivery Channels that will be used to leverage the Service Component, and the legislative requirements that govern its use and interaction." The Service Access and Delivery service area consists of four service categories, Access Channels, Delivery Channels, Service Requirements, and Service Transport.

#### 7.1.1. Access Channels

The FEA states that access channels "define the interface between an application and its users, whether it is a browser, personal digital assistant or other medium." The standards that comprise the Access Channels subcategory are shown in Figure 5 below.

**Figure 5: Service Access and Delivery – Access Channels**

Service Subcategory	Specification / Technology	Standard
Collaboration Communications	Electronic Mail (E-mail)	Extended SMTP (ESMTP)
		Secure / Multipurpose Internet Mail Extensions (S/MIME)
		Simple Mail transfer Protocol (SMTP)
	Facsimile (Fax)	ITU-U Recommendations: T.6, T.30, T.60, T.61, T.62, T.62bis, T.70, T.72, T.73, T.503, T.521, T.563, and F.161

Service Subcategory	Specification / Technology	Standard
Other Electronic Channels	Markup Languages	Extensible HyperText Markup Language (XHTML)
		HyperText Markup Language (HTML)
	Voice Protocols	Session Initiation Protocol (SIP)
	Web Services	Asynchronous Service Access Protocol (ASAP)
		Business Process Execution Language (BPEL)
		DIME
		EbXML
		Extensible Markup Language (XML)
		Security Assertion Markup Language (SAML)
		Simple Object Access Protocol (SOAP)
		SOAP Message Transmission Optimization Mechanism (SOAP MTOM)
		Universal Business Language (UBL)
		Universal Description, Discovery, and Integration (UDDI)
		WS-*
		Web Services - IM/Web Chat
	IRC	
	Protocol for SYNchronous Conferencing (PSYC)	
	Session Initiation Protocol for Instant Messaging and Presence Leveraging Extensions (SIMPLE)	
	Wireless Village (WV)	
	Web Browser	Browser
Extensible HyperText Markup Language (XHTML)		

Service Subcategory	Specification / Technology	Standard
Wireless/PDA		HyperText Markup Language (HTML)
		HyperText Transfer Protocol (HTTP)
		HyperText Transfer Protocol Secure (HTTPS)
	WPDA	CDMA One
		CDMA2000 1xEV-DO
		CDMA2000 1xEV-DV
		IEEE 802.15
		W-CDMA
		Wired Equivalent Privacy (WEP)
	WLAN	IEEE 802.11g
IEEE 802.16		
RFID	JTC 1/SC 31 Automatic Identification and Data Capture Techniques	
	JTC 1/SC 17 Identification Cards and related devices	
	ANSI/NCITS T6 256-2001 Radio Frequency Identification (RFID) Technology	

### 7.1.2. Delivery Channels

Delivery channels define the level of access to applications and systems based upon the type of network used to deliver them, as stated by the FEA. The delivery channel standards are shown in Figure 6 below.

**Figure 6: Service Access and Delivery: Delivery Channels**

Service Subcategory	Specification / Technology	Standard
Extranet	World Wide Web (WWW)	Dynamic HTML (DHTML)
		Extensible Markup Language (XML)
		HyperText Markup Language (HTML)
		Simple Object Access Protocol (SOAP)
		Universal Description, Discovery, and Integration (UDDI)

Service Subcategory	Specification / Technology	Standard
		Web Services Description Language (WSDL)
Internet	World Wide Web (WWW)	Dynamic HTML (DHTML)
		Extensible Markup Language (XML)
		HyperText Markup Language (HTML)
		Simple Object Access Protocol (SOAP)
		Universal Description, Discovery, and Integration (UDDI)
		Web Services Description Language (WSDL)
Intranet	World Wide Web (WWW)	Dynamic HTML (DHTML)
		Extensible Markup Language (XML)
		HyperText Markup Language (HTML)
		Simple Object Access Protocol (SOAP)
		Universal Description, Discovery, and Integration (UDDI)
		Web Services Description Language (WSDL)
Peer to Peer (P2P)	Peer to Peer	JXTA
		Simple Object Access Protocol (SOAP)
Virtual Private Network (VPN)	Hybrid VPN - Secure/Trusted	IPSec
		Layer 2 Tunneling Protocol (L2TP)
		Secure Sockets Layer (SSL)
		Transport Layer Security (TLS) Protocol

### 7.1.3. Service Requirements

The FEA states that the service requirements category defines the necessary aspects of an application, system or service to include legislative, performance, and hosting. The standards developed for the service requirements category are listed in Figure 7 below.

**Figure 7: Service Access and Delivery – Service Requirements**

Service Subcategory	Specification / Technology	Standard
Authentication / Single Sign-on (SSO)	Security	FIPS 201
		Kerberos
		S/MIME
		Security Assertion Markup Language (SAML)
		X.509
		XML-Signature Syntax and Processing
Legislative / Compliance	Section 508	Electronic and Information Technology Accessibility Standards (EITAS)
	Security	FIPS 186

#### 7.1.4. Service Transport

Service Transport defines the end to end management of the communications session to include the access and delivery protocols, as defined by FEA. The standards for the Service Transport subcategory are list below in Figure 8.

**Figure 8: Service Access and Delivery – Service Transport**

Service Subcategory	Specification / Technology	Standard
Service Transport	Transport	File Transfer Protocol (FTP)
		Internet Control Message Protocol (ICMP)
		IPv6
		RMI
		SSH File Transfer Protocol (SFTP)
		Transmission Control Protocol (TCP)
		User Datagram Protocol (UDP)
Supporting Network Services	Networking	Border Gateway Protocol Version 4 (BGP-4)
		Directory Services (X.500)
		Domain Name System (DNS)
		Dynamic Host Configuration Protocol for IPv6 (DHCPv6)

Service Subcategory	Specification / Technology	Standard
		Extended SMTP (ESMTP)
		H.323
		Internet Message Access Protocol (IMAP)
		Lightweight Directory Access Protocol (LDAP)
		Multipurpose Internet Mail Extensions (MIME)
		Simple Mail Transfer Protocol (SMTP)
		SNMP v3.0
		T.120

## 7.2. Service Platform and Infrastructure

The Service Platform and Infrastructure Service Area defines the collection of platforms, hardware and infrastructure standards that enable Component Based Architectures and Service Component reuse, as defined by FEA. The subcategories that comprise the Service Platform and Infrastructure service area are: Support Platforms, Delivery Servers, Software Engineering, Database / Storage, and Hardware / Infrastructure. Each of the standards for these subcategories is listed below.

### 7.2.1. Support Platforms

Support platforms are hardware or software architectures. The term originally dealt with only hardware, and it is still used to refer to a CPU model or computer family. The standards for this subcategory are listed in Figure 9 below.

**Figure 9: Service Platforms and Infrastructure - Support Platforms**

Service Subcategory	Specification / Technology	Standard
Platform Dependent: Application Support Platforms	CICS	CICS
	Windows.Net	.NET 2.0
Platform Dependent: Operating Systems	Windows	Windows 2003
		Windows XP
Platform Independent (Other): Virtualization Platforms	VMWare	VMware ESX Server
		VMware Workstation
Platform Independent: Application Support Platforms	Java 2 Platform Enterprise Edition (J2EE)	J2EE1.4
Platform Independent: Operating Systems	Linux	Linux
	Solaris	Solaris 10
Programming Languages	-	C#
		C/C++

Service Subcategory	Specification / Technology	Standard
		Java
		JavaScript
		Perl
		VBScript
		Visual Basic.NET
Wireless / Mobile	Java 2 Platform, Micro Edition (J2ME)	Java 2 Platform, Micro Edition (J2ME)

### 7.2.2. Delivery Servers

Delivery Servers are front-end platforms that provide information to a requesting application. It includes the hardware, operating system, server software, and networking protocols. The standards for this subcategory are listed in Figure 10 below.

**Figure 10: Service Platforms and Infrastructure – Delivery Servers**

Service Subcategory	Specification / Technology	Standard
Application Servers	Application Servers	*See the Supporting Platforms service category of the Service Platform and Infrastructure service area.
Media Servers	N/A	N/A
Portal Servers	Portal Server	*See the Business Logic service category of the Component Framework service area.
Web Servers	Web Server	Hypertext Transfer Protocol (HTTP) 1.1

### 7.2.3. Software Engineering

Software engineering covers the technology associated with building software systems as well as technical solutions supporting management issues, such as testing, modeling and versioning. The TRM is concerned with component technical architecture, not engineering processes. The standards for this subcategory are listed in Figure 11 below.



**Figure 11: Service Platforms and Infrastructure – Software Engineering**

Service Subcategory	Specification / Technology	Standard
Integrated Development Environment (IDE)	N/A	N/A
Modeling	N/A	N/A
Software Configuration Management	N/A	N/A
Test Management	N/A	N/A

#### 7.2.4. Database /Storage

Database / Storage refers to a collection of programs that enables storage, modification, and extraction of information from a database, and various techniques and devices for storing large amounts of data. The standards for this subcategory are listed in Figure 12 below.

**Figure 12: Service Platforms and Infrastructure – Database Storage**

Service Subcategory	Specification / Technology	Standard
Database	RDBMS/DBMS	DB2
		Oracle
		SQL Server
Storage	NAS	CIFS
		EXT2/EXT3
		NTFS
	SAN	Fibre Channel
		iSCSI

#### 7.2.5. Hardware / Infrastructure

This subcategory defines the physical devices, facilities and standards that provide the computing and networking within and between enterprises. The standards in this subcategory are listed in Figure 13 below.

**Figure 13: Service Platforms and Infrastructure – Hardware / Infrastructure**

Service Subcategory	Specification / Technology	Standard
Embedded Technology Devices	N/A	N/A
Local Area Network (LAN)	Ethernet	802.3
	VLAN	IEEE 802.1Q

Service Subcategory	Specification / Technology	Standard
Network Devices / Standards	Firewall	* See TD P 85-01 and the Security category of the Component Framework service area.
	Gateway	N/A
	Hub	N/A
	Router	<p>* See all technical standards specified in Local Area Network (LAN) and Wide Area Network (WAN) service subcategories of the service Platform and Infrastructure service area.</p> <p>* See all technical standards specified in the service Transport and Supporting Network Services subcategories of the service Access and Delivery service area.</p>
	Switch	<p>* See all technical standards specified in the Local Area Network (LAN) service subcategory of the Service Platform and Infrastructure service area.</p> <p>* See all technical standards specified in the Service Transport and Supporting Network Services subcategories of the Service Access and Delivery service area.</p>
Peripherals	Printer	* See current SmartBUY agreements.
	Scanner	* See current SmartBUY agreements.
Servers / Computers	Enterprise Servers	Dell
		HP
		IBM
		Sun Microsystems
Mainframe	IBM zSeries	
Video Conferencing	Bridge, Codec, Receivers	H.323

Service Subcategory	Specification / Technology	Standard
		T.120
Wide Area Network (WAN)	WAN	TCS (ATM)/TCE

### 7.3. Component Framework

The FEA defines the Component Framework service area as the underlying foundation and technical elements by which Service Components are built, integrated and deployed across Component-Based and Distributed Architectures. The subcategories that comprise this service area are: Security, Presentation / Interface, Business Logic, Data Interchange, and Data Management. The Component Framework subcategories and their respective standards are described below.

#### 7.3.1. Security

The Security subcategory defines the methods of protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide integrity, confidentiality and availability, as defined by FEA. The standards for this subcategory are listed in Figure 14 below.

**Figure 14: Component Framework - Security**

Service Subcategory	Specification / Technology	Standard
Certificates / Digital Signature	-	CCP-PROF
		FIPS 140-2 - Security Requirements for Cryptographic Modules
		Internet IP Security Domain of Interpretation for ISAKMP
		Internet Key Exchange (IKE)
		Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List
Supporting Security Services	-	Certificate-Issuing and Management Components Family, Security Level 4 PP - Version 1.0

Service Subcategory	Specification / Technology	Standard
		Controlled Access Protection Profile - Version 1.d
		Domain Name System Security Extensions (DNSSEC)
		FIPS 113 - Data Authentication Algorithm (DAA)
		FIPS 180-2 - Secure Hash Standard (SHS)
		FIPS 185 - Escrowed Encryption Standard (EES)
		FIPS 186-2 - Digital Signature Standard (DSS)
		FIPS 197 - Advanced Encryption Standard (AES)
		FIPS 198 - Keyed-Hash Message Authentication Code (HMAC)
		FIPS 201 - Personal Identity Verification (PIV)
		FIPS 46-3 - Data Encryption Standard (DES)
		FIPS 81 - Data Encryption Standard (DES) Modes of Operation
		Intrusion Detection System (IDS) System Protection Profile - Version 1.5
		Intrusion Detection System Analyzer Protection Profile - Version 1.2
		Intrusion Detection System Scanner Protection Profile - Version 1.2
		Kerberos
		Secure Shell (SSH)
		Secure Sockets Layer (SSL) Protocol

Service Subcategory	Specification / Technology	Standard
		Security Assertion Markup Language (SAML) Version - 1.1
		Transport Layer Security (TLS) Protocol
		Web Services Security (WS-Security) - Version 1.0
	Secure Hypertext Transfer Protocol (HTTPS)	Secure Hypertext Transfer Protocol (HTTPS)

### 7.3.2. Presentation / Interface

This subcategory is defined by FEA as the connection between the user and the software, consisting of the presentation that is physically represented on the screen. The standards for this subcategory are listed in Figure 15 below.

**Figure 15: Component Framework – Presentation / Interface**

Service Subcategory	Specification / Technology	Standard
Wireless / Mobile / Voice	-	Wireless Markup Language (WML)
Content Rendering	-	ActionScript
		AJAX
		Cascading Style Sheets (CSS)
		Dynamic HTML (DHTML)
		Java Portlet API (JSR 168)
		Web Services for Remote Portlets (WSRP)
Dynamic / Server-Side Display	-	Active Server Pages .Net (ASP.Net)
		JavaServer Pages (JSP)
		Web Service User Interface (WSUI)
Static Display	-	eXtensible HTML (XHTML)
		HyperText Markup Language (HTML)

### 7.3.3. Business Logic

The Business Logic subcategory defines the software, protocol or method in which business rules are enforced within applications, as stated by FEA. The standards for this for this subcategory are listed in Figure 16 below.

**Figure 16: Component Framework – Business Logic**

Service Subcategory	Specification / Technology	Standard
Platform Dependent	-	COBOL/CICS (Mainframe)
Platform Independent	-	Enterprise Java Beans (EJB) 2.1 (JSR 153)
	Java Servlets	Java Servlet Specification 2.4

### 7.3.4. Data Interchange

FEA defines the Data Interchange subcategory as the methods in which data is transferred and represented in and between software applications. The standards for this subcategory are listed in Figure 17 below.

**Figure 17: Component Framework – Data Interchange**

Service Subcategory	Specification / Technology	Standard
Data Exchange	-	Dublin Core Metadata Standard
		ebXML
		FIXML
		Open Financial Exchange (OFX)
		Simple Object Access Protocol (SOAP)
		XML Metadata Interchange (XMI)

### 7.3.5. Data Management

The Data management subcategory is the management of all data/information in an organization. It includes data administration, the standards for defining data and the way in which people perceive and use it, as defined by FEA. The standards for this subcategory are listed in Figure 18 below.

**Figure 18: Component Framework – Data Management**

Service Subcategory	Specification / Technology	Standard
Database Connectivity	-	ActiveX Data Objects (ADO)
		ActiveX Data Objects Extensions for Data Definition Language and Security (ADOX)
		Distributed Relational Database Architecture (DRDA)
		Java Data Objects (JDO)
		Java Database Connectivity (JDBC)
		MDX
		OLE DB
		OLE/DB for OLAP (ODBO)
		Open Database Connectivity (ODBC)
		SQL*NET
		SQL: 2003
		SQLJ
		Oracle PL/SQL
		Microsoft Transact SQL
Reporting and Analysis	-	CWM
		JOLAP
		OLAP
		XBRL
		XML/A
		XQuery

## 7.4. Service Interface and Integration

The Service Interface and Integration Service Area defines the discovery, interaction and communication technologies joining disparate systems and information providers, as stated by FEA. The Service Interface and Integration service area is comprised of three subcategories: Integration, Interoperability, and Interface. Each of the standards associated with these subcategories are described below.

### 7.4.1. Integration

The Integration subcategory defines the software services enabling elements of distributed business applications to interoperate, as stated by FEA. The standards for this subcategory are listed in Figure 19 below.

**Figure 19: Service Interface and Integration - Integration**

Service Subcategory	Specification / Technology	Standard
Enterprise Application Integration	Application Connectivity	Extensible Markup Language (XML)
		Java Message Service (JMS)
		JSR-170 (Content Repository API for Java)
		Simple Object Access Protocol (SOAP)
		Web Services
	Business Process Management	Business Process Execution Language (BPEL)
		Java Business Integration (JBI) (JSR 208)
	Transformation and Formatting	<none>
	Middleware	.NET
Data Warehouse		Common Warehouse Metadata Interchange (CWM1)
Java 2 Platform Enterprise Edition (J2EE)		J2EE1.4
		Java EE Connector Architecture (JCA)
		Java Message Service (JMS)
		Java Naming and Directory Interface (JNDI)
Other		Integrated Object Model (IOM)
		Java Business Integration (JBI) (JSR 208)
		WS-*
		XML-RPC

### 7.4.2. Interoperability

FEA defines the Interoperability subcategory as the capabilities of discovering and sharing data and services across disparate systems and vendors. The standards for this subcategory are listed in Figure 20 below.



**Figure 20: Service Interface and Integration – Interoperability**

<b>Service Subcategory</b>	<b>Specification / Technology</b>	<b>Standard</b>
Data Format / Classification	Data Format / Classification	eXtensible Access Control Markup Language (XACML)
		Extensible Markup Language (XML)
		XSL-FO
Data Transformation	Data Transformation	XPath
		XSLT

### 7.4.3. Interface

The Interface subcategory defines the capabilities of communicating, transporting and exchanging information through a common dialog or method, as stated by FEA. The standards for this subcategory are listed in Figure 21 below.

**Figure 21: Service Interface and Integration - Interface**

<b>Service Subcategory</b>	<b>Specification / Technology</b>	<b>Standard</b>
Service Description / Interface	Web Services	Web Services Description Language (WSDL)
Service Discovery	Discovery	Universal Description, Discovery, and Integration (UDDI)

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## APPENDICES

### APPENDIX A: References

- The Federal Enterprise Architecture:  
<http://www.whitehouse.gov/omb/egov/a-2-EAModelsNEW2.html>
- The OMB EA Assessment Framework:  
<http://www.whitehouse.gov/omb/egov/a-2-EAAssessment.html>
- The OMB Circular A-130:  
<http://www.whitehouse.gov/omb/circulars/a130/a130trans4.html>
- The Clinger-Cohen Act:  
[http://www.cio.gov/Documents/it\\_management\\_reform\\_act\\_Feb\\_1996.html](http://www.cio.gov/Documents/it_management_reform_act_Feb_1996.html)
- The Treasury IT Strategic Plan:  
[http://www.treas.gov/offices/cio/egov/docs/ITMB\\_Volume\\_2\\_IT\\_Strategic\\_Plan\\_v1%2002.pdf](http://www.treas.gov/offices/cio/egov/docs/ITMB_Volume_2_IT_Strategic_Plan_v1%2002.pdf)
- The Treasury Target Technical Architecture:  
published to the EA Resource Center intranet site
- The Treasury IT Modernization Blueprint:  
published to the EA Resource Center intranet site

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## APPENDIX B: Standards Bodies

Many IT standards described in this document have been issued by official standards bodies, most of which maintain Web sites that provide additional information about activities, events, and other news of interest to the IT community. Following is a list of the standards bodies in this document that maintain Web sites.

- American National Standards Institute (ANSI)  
<http://www.ansi.org/default.asp>
- Comite' Consultatif International de Telegraphique et Telephonique (CCITT) (CCITT changed its name to International Telecommunications Union (ITU) in 1993.)  
<http://www.itu.int/ITU-T/index.html>
- European Computer Manufacturers Association (ECMA)  
<http://www.ecma.ch/index.htm>
- Electronics Industry Alliance (EIA)  
<http://www.eia.org/>
- Federal Telecommunications Standards Committee (FTSC)  
<http://www.ncs.gov/n6/about/html/ftsc.htm>
- International Electrotechnical Commission (IEC)  
<http://www.iec.ch/>
- Institute of Electrical and Electronics Engineers, Inc. (IEEE)  
<http://standards.ieee.org/>
- Internet Engineering Task Force (IETF)  
<http://www.ietf.org/home.html>
- International Organization for Standardization (ISO)  
<http://www.iso.ch/>
- International Telecommunications Union (ITU)  
<http://www.itu.int/ITU-T/index.html>
- National Information Standards Organization (NISO)  
<http://www.niso.org/>

- 
- National Institute of Standards and Technology (NIST)  
<http://www.nist.gov/>
  - Object Management Group (OMG)  
<http://www.omg.org/>
  - Open Software Foundation (OSF)  
(OSF and X/Open have merged to form The Open Group.)  
<http://www.opengroup.org>
  - Telecommunications Industry Association (TIA)  
<http://www.tiaonline.org/standards>
  - United States Product Data Association (US PRO)  
<https://www.uspro.org/>
  - World Wide Web Consortium (W3C)  
<http://www.w3.org/Overview.html>