



Profile for Core Service Standards

1 Introduction

This document outlines a set of recommended profile selections of core web standards and specifications and other guidelines used to describe FRED services in general and FRED service expressions. These core standards represent data modelling, service interfaces, transport protocols, messaging, etc. and are the technology standards needed to create designs from service implementations. They represent requirements that are generally not documented in service genres and service expressions. These profiles focus on key interoperability points, not style or modelling recommendations (e.g., use of camel case tokens). When present, modelling recommendations are separate from other profiling requirements.

Use of the same profiles across all FRED services and resource data models enhances interoperability. Requirements defined herein may be referenced in documenting service genres and service expressions, eliminating the need to explicitly cite details of these requirements in the corresponding service description. Designs of service implementations will need to refer to the underlying specifications and profiles cited herein for more detailed requirements on designs and implementations.

The words **MUST**, **MUST NOT**, **REQUIRED**, **SHALL**, **SHALL NOT**, **SHOULD**, **SHOULD NOT**, **RECOMMENDED**, **MAY**, and **OPTIONAL** in this document are to be interpreted as described in [RFC 2119].

1.1 Precedence

Anything not defined herein or by reference to the specifications defined herein **SHALL** be defined in the service genre and service expression.

NB: Specifications **SHALL** be interpreted to exclude community specific profiles, e.g., IMS, MedBiquitous. These community requirements are captured in this document directly.

2 Documents

2.1 All XML Documents

- XML documents **SHALL** conform to either XML 1.0 (4th Edition, 2006-08-16) or XML 1.1 (2nd Edition, 2006-08-16).
- XML 1.0 is **RECOMMENDED**.
- XML processors **SHALL** accept either XML 1.0 or 1.1.
- XML document formats **SHOULD** be formally defined (DTD, XSD, Relax NG, Schematron).
- XML document formats **SHOULD** be defined with XSDs.

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- XML document formats SHOULD be versioned.
- FRED-unique XML document formats SHALL be defined via an XSD.
- FRED-unique XML document formats SHALL be versioned.

NB: A FRED-unique document is one created explicitly for the FRED project when an equivalent open-standards based document format does not exist.

2.2 XSD-Based XML Documents

- XML documents based on an XSD SHOULD include a `schemaLocation` attribute that resolves to the XSD used to define the format of the document instance.
- XML document processors SHOULD use the specified `schemaLocation`.

3 Document Formats

3.1 XML Schema Design (XSD)

- XSDs SHALL conform to XSD 1.0 (2004-10-28).

3.2 FRED-Unique XSD Design

- The XML document format for a FRED Resource SHALL have a document schema represented as an XSD.
- A FRED Resource XSD SHALL have its own target namespace.
- A FRED Resource XSD target namespace SHOULD be a URI.
- A FRED Resource target namespace string SHALL consist of at least three parts:
 - The FRED XSD namespace root (TBD, e.g., HDL:FREDNA).
 - The resource name, e.g., *root/resource*.
 - The version, e.g., *root/resource/version*. (Versioning scheme TBD.)

NB: The same resource may be shared across different services; thus XSDs are assigned by resource, not by service genre or service expression.

- A FRED Resource XSD shall include a default namespace declaration equal to the target namespace.
- A FRED Resource XSD shall use the namespace prefix *xsd* for XML Schema.
- A FRED Resource XSD SHALL set *elementFormDefault* to qualified.
- A FRED Resource XSD SHALL set *attributeFormDefault* to unqualified.
- A FRED Resource XSD SHALL include a schema version attribute on each root element.
 - The version information SHALL correspond to the version information in the target namespace string.
 - Corresponding XML document instances SHOULD include version information.
- A FRED Resource XSD SHALL NOT use default values.
- A FRED Resource XSD SHALL be published at a known location maintained by FRED.

- Copies of external 3rd party XSDs should be published at a known location maintained by FRED.

NB: When a 3rd party specification does not define the characteristics listed above, use the FRED Resource requirements.

3.3 FRED-Unique XSD Recommendations

- The Venetian Blind design pattern is recommended. Exceptions include multiple root elements for service request and response schemata.
- XSDs should be fully documented with *<annotation>* elements.
- FRED Best Practices for style and naming conventions should be used.

4 Web Services

4.1 Definitions: WSDL

- Web Services shall be based on WS-I Basic Profile (1.1) as refined herein.
 - NB: WS-I 1.1 is adopted as an upward compatible minor release from WS-I 1.0 used in other profiles.
- WSDL documents shall use WSDL 1.1.
- WSDL documents shall not use WSDL 2.0.
- WSDL service bindings shall use *document-literal*.
- WSDL service binding shall not use *RPC-literal*.
- WSDL service bindings should use a wrapped *document-literal* approach.
- WSDL documents shall not include inline content document definitions.
- WSDL documents shall import XSD document formats.
- WSDL messages should have a single *<part>* referencing a complete document.
- WSDL definitions shall define a *soap:binding* with only one port.
- FRED defines a common set of web service faults. All FRED services SHALL use these common faults.

NB: Web service faults are adopted from MedBiquitous. (To be done: Create a FRED version of the document for faults).

4.2 Messaging: SOAP

- The protocol binding for WSDL shall be SOAP 1.1.
- SOAP 1.2 SHALL NOT be used.
- All messages shall be synchronous request/response.
- The service operation shall be defined in the SOAP body.
- Status information shall be defined in the SOAP header.
- Attachments SHOULD be exchanged in SOAP messages via the Message Transmission Optimization Mechanism (MTOM).

NB: MTOM is still a WS-I draft. MTOM uses SOAP 1.2. This may be a problem versus other requirements of SOAP 1.1.

4.3 Transport: HTTP

- HTTP 1.1 shall be used for transport of SOAP messages.

- HTTPS SHALL be used for secure end transport-level end-to-end messages.

4.4 Service Discovery

- All FRED documents (abstract WSDL, XSDs) shall be published at a known location.
- Individual service instances SHALL publish their own service definitions that reference the abstract FRED definitions.
- UDDI descriptions of services shall not be required.

4.5 Definitions: REST

- Recommendations TBD.

5 Internationalization

- All XML documents shall use UTF-8 encoding.

NB: This is a FRED specific recommendation (versus choice of UTF-8 or UTF-16).

6 Security

- Services may adopt WS-I Basic Security.

NB: WS-I Basic Security is still a draft specification.

7 References

Hypertext Transfer Protocol – HTTP/1.1, <http://www.ietf.org/rfc/rfc2616.txt>
The Secure HyperText Transfer Protocol, <http://www.ietf.org/rfc/rfc2660.txt>
IMS General Web Services Final Specification,
<http://www.msglobal.org/gws/index.html>
MedBiquitous XML Schema Design Guidelines,
http://medbiq.org/technology/tech_architecture/xmldesignguidelines.pdf
MedBiquitous Web Services Design Guidelines,
http://medbiq.org/technology/tech_architecture/webservicesguidelines.pdf
Best Practices for Designing Web Services in the Library Context, NISO RP 2006-01, http://www.niso.org/committees/Services/Services_story.htm
Simple Object Access Protocol (SOAP) 1.1, <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>
SOAP Message Transmission Optimization Mechanism,
<http://www.w3.org/TR/soap12-mtom/>
Web Services Description Language (WSDL) 1.1, <http://www.w3.org/TR/wsdl>
WS-I Basic Profile 1.1, <http://www.ws-i.org/Profiles/BasicProfile-1.1.html>
WS-I Basic Security Profile 1.0 (Draft), <http://www.ws-i.org/Profiles/BasicSecurityProfile-1.0.html>
Extensible Markup Language (XML) 1.0 (Fourth Edition),
<http://www.w3.org/TR/REC-xml/>
Extensible Markup Language (XML) 1.1 (Second Edition),
<http://www.w3.org/TR/xml11/>
XML Schema Part 1: Structures (Second Edition),
<http://www.w3.org/TR/xmlschema-1/>
XML Schema Part 2: Datatypes (Second Edition),
<http://www.w3.org/TR/xmlschema-2/>
XML Schemas: Best Practices,
<http://www.xfront.com/BestPracticesHomepage.html>

8 Change Log

Version	Date	Comment
0.1	2007-01-12	Initial version based on WS-I, IMS WS, Medbiq

		guidelines and NISO.
0.11	2007-01-19	Formatted for public release.

