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Open Geospatial Consortium (OGC)

Request for Quotations (RFQ)
and
Call for Participation (CFP)
for OGC Testbed 11

Annex A

OGC Testbed 11 WBS and Work Items

RFQ Issuance Date: 22 October 2014

Proposal Due Date: 21 November 2014

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1 Introduction

This Annex A document describes the Work Breakdown Structure (WBS) and the work items for the OGC Testbed 11 Web Services Initiative – Phase 11 Initiative. The Work Items are segregated into three threads. Each thread classifies work items as funded or unfunded items, depending on current sponsorships.

2 Sponsor Priorities

The following tables show the Testbed 11 deliverables in each of the threads. Work items that are designated with an "F" are work items that are currently funded. Those that have a "U" are within scope of this RFQ but may not be funded.

All Participants are required to provide in-kind contributions. Some participants will be fully in-kind. Participants are encouraged to propose to provide part or all of a deliverable as in-kind. Any item proposed as a fully in-kind contribution that meets the requirements and architecture for Testbed 11 will be accepted. In-kind contributions are used as a criterion for evaluating proposals seeking cost-share funding.

2.1 Urban-Climate Resilience (UCR) Deliverables Funding

Table 1 – UCR Thread Deliverables Summary

Reports	Funded/ Unfunded
OGC Testbed 11 High Resolution Flood Information Scenario ER	F
OGC Testbed 11 Georeferenceable Grid Harmonization ER	F
Change Requests for Georeferenceable Grid	F
OGC OWS Context Change Requests (unfunded)	U
OGC Testbed 11 Multi-dimensional GeoPackage Supporting Terrain and Routes ER	F
OGC GeoPackage Change Requests (unfunded)	U
OGC Testbed 11 Summary Report of Findings for WFS-T Information Exchange Architecture ER	F
OGC Testbed 11 Reference Case Study of Multiple WFS-T Interoperability ER	F
Geopackaging ER	F
OGC Testbed 11 DGIWG GMLJP2 Testing Results ER	F
OGC Standards Change Requests	F

Components	Funded/ Unfunded
Flood information scenario client	F
High resolution flood data server	F
Low resolution flood model data server	F
High Resolution DEM/Bathymetry server	F
Flood modeling additional data server	F
High resolution model processing server	F
Alert Service implementation supporting the scenario (unfunded)	U
Web Processing Service implementation supporting the scenario	F
Table Joining Service implementation supporting the extraction of supplemental web based information linked to existing feature data	F
OGC GeoPackage SQLite container with routes embedded	F
OGC GeoPackage SQLite container with terrain (unfunded)	U
Web Coverage Processing Service implementation supporting the scenario	F

Components	Funded/ Unfunded
Web Map Service implementation supporting the scenario (unfunded)	U
Web Feature Service with Stored Query and GML Streaming implementation supporting the scenario	F
Web Coverage Service implementation with JPIP supporting the scenario	F
Web Map Tile Service implementation supporting the scenario	F
Client software supporting the scenario	F
Client Desktop (submitting transactions via WFS-T for Common Operational Picture	F
Client Mobile (submitting transactions via WFS-T)	F
Web Feature Service - Transactional (WFS-T 2.x) for Common Operating Picture	F
Geosynchronization Service (GSS) 2.x for Common Operating Picture data	F
WFS-T 2.x with REST Interface (and GeoJSON data delivery)	F
Schema Implementations for NZ-LINZ Applications	F
OGC Web Services for GMLJP2 and GeoPackage Synchronization	F
Client to test Geopackaging WPS and GSS	F
Cloud facilities to allow participants to host services in the cloud (unfunded)	U
Simulation models (unfunded)	U

2.2 Cross-Community Interoperability (CCI) Deliverables Funding

Table 2 – CCI Thread Deliverables Summary

Reports	Funded/ Unfunded
OGC Testbed 11 REST Interface ER	F
REST Change Requests	F
OGC Testbed 11 SOAP Interface ER	F
SOAP Change Requests	F
OGC Testbed 11 Implementing JSON/GeoJSON in an OGC Standard ER	F
JSON/GeoJSON Change Requests	U
OGC Testbed 11 Implementing Linked Data and Semantically Enabling OGC Services ER	F
OGC Testbed 11 Use of Semantic Linked Data with RDF for National Map NHD and Gazetteer Data ER	F
OGC Testbed 11 Catalogue Service Analysis and Recommendation ER	F
OGC Testbed 11 Incorporating Social Media in Emergency Response ER	F
OGC Testbed 11 Aviation - Guidance Using SBVR for Geometrical Constraints ER	F
OGC Testbed 11 Aviation - Digital NOTAM Validation and Enrichment Service ER	F
OGC Testbed 11 Aviation - Feature Schema Recommendations ER	F
OGC Testbed 11 Cross Community Interoperability ER on semantic mediation	F

Components	Funded/ Unfunded
WFS-G with Semantic Mediation (hydro and non-hydro features)	F
WPS to Generate RDF from National Map NHD Data	F
Generate RDF for Non-hydro Features from Gazetteer Data	F
Catalog Service Supporting the Scenario	F
WPS 2.0 for Social Media	F
GeoSPARQL	F
SOS 2.0 for Social Media	F
WFS 2.0 for Linked Data	F
Ontology Server SPARQL for Symbology and Aviation	F
SLD/SE Producer for Symbology and Aviation	F
WFS 2.0 for Country One	F
WFS 2.0 for Country Two	F
FPS for Symbology and Aviation	F
Client Supporting Linked Data Semantics and Social Media	F
CAT 3.0 Compliance Test	F
WFS 1.1.0 Compliance Test	F
Tool to Automate SBVR to Schematron	F
WPS Validator for Aviation	F
Client for Aviation	F
WFS AIXM including Digital NOTAM	F
WFS for Aviation Feature Schemas	F

2.3 Geo4NIEM Deliverables Funding

Table 3 – Geo4NIEM Thread Deliverables Summary

Reports	Funded/ Unfunded
OGC Testbed 11 Geo4NIEM Architecture Design and Implementation ER and Fact Sheet	F
OGC Testbed 11 NIEM & IC Data Encoding Specification Assessment and Architecture ER	F
OGC Testbed 11 Test and Demonstration Results for NIEM Using IC Data Encoding Specifications ER	F
OGC Testbed 11 NIEM-GML-NIEM Round Trip Assessment and Recommendations ER	F
OGC Testbed 11 NIEM-GML Feature Processing API using OGC Web Services ER	F
OGC Testbed 11 Implementing Common Security Across the OGC Suite of Standards ER	F

Components	Funded/ Unfunded
Client with Security (all security domain roles) for Round Trip and GML Feature Processing	F
Client (IEPD Producer / Consumer) (Round-Trip)	F
WFS-T to Process IEPD-IC Data Encoded Transactions	F
Security Tagging Transform Component	F
Policy Enforcement Point (PEP)	F
Policy Decision Point (PDP)	F
Policy Administration Point (PAP)	F
Data Policy Information Point (PIP)	F

3 Interoperability Initiative Process Framework

This section describes a flexible framework of standards, repeatable processes, which can be combined and adapted as necessary to address the requirements of each Interoperability Initiative. These tasks are executed with a Virtual Team Infrastructure. This Process Framework (Figure 1) forms the basis for the OGC Testbed 11 Initiative Work Breakdown Structure.

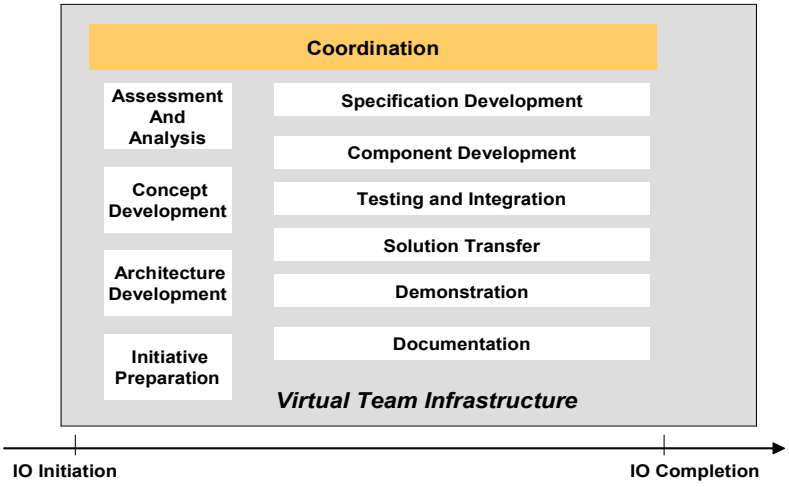

Figure 1: Interoperability Initiative Process Framework.

3.1 Tasks

3.1.1 Coordination

This task enables overall coordination among assigned OGC Staff, OGC Interoperability Program (IP) Team, Sponsors, selected organizations, and other TC/PC Members as needed to perform the following Subtasks:

- **Collaborative Environment -** OGC IP Team provides synchronous and asynchronous collaboration environments for cross-organization, globally distributed, virtual teams working interdependently to execute Initiative Orders.
- **Initiative Plan Development** – Development of Project Plans, Project Schedules and Work Breakdown Structures. Input may include technical and project management approach, tasks/schedules, communications plan, resource plans, risk and mitigation strategies, and definition of the standards, component development and integration tasks necessary to realize the architecture.
- **Management** – Services such as requirement, cost, schedule and performance monitoring and status reporting. The goal is to ensure that assigned project tasks are performed within budget, the work is progressing according to the agreed schedule, and any changes to requirements or personnel are managed to reduce the risk of cost overrun or schedule delay.
- **Communication** – Includes communicating status and issues of concern for ongoing Project related activities and planned Initiative to OGC and other organizations e.g. ISO.

3.1.2 Assessment and Analysis

Implemented during Planning Studies, this task requires assessment/evaluation and analysis of issues and documentation of an organization's or domains existing capabilities, and assessment of requirements for OGC compliant technology.

3.1.3 Concept Development

This task conducts a Feasibility Study that assesses emerging technologies and architectures capable of supporting eventual Interoperability Initiatives (e.g. Testbed). A Request for Technology (RFT) may be used to gain a better understanding of the current state of a potential technology thrust and the architecture(s) used in support of that technology. The feasibility study examines alternative prototype mechanisms that enable commercial web-services technology to interoperate. The study may also assess the costs and benefits of the architectural approaches, technologies, and candidate components to be utilized in a testbed and potential demonstration. This task also collates Sponsor requirements and assesses the applicability of current specifications.

3.1.4 Architecture Development

This task defines the architectural views for any given Initiative. In the context of the OGC Interoperability Program, there are three–and perhaps more - architectural views for any given effort. These views are the Enterprise View, Information View and Computational View (based on RM-ODP, ISO 10746).

3.1.5 Initiative Preparation

This task defines the participant budget (if any), develops and executes agreements and contracts that outline roles and responsibilities of each participant. This task may refine the Work Package.

3.1.6 Specification Development

This task defines and develops models, schemas, encodings, and interfaces necessary to realize required Architectures. This task may include activities to coordinate ongoing Initiatives with Specification Program activities.

3.1.7 Component Development

This task develops prototype interoperable commercial software components based on draft candidate implementation specifications or adopted specifications necessary to realize the required Architecture.

3.1.8 Testing and Integration

This task integrates, documents and tests functioning interoperable components that execute operational elements, assigned tasks, and information flows required to fulfill a set of user requirements. It includes Technology Integration Experiments (TIEs).

3.1.9 Solution Transfer

This task prepares prototypical interoperable components so that they can be assembled at required sites.

3.1.10 Demonstration

This task defines, develops and deploys functioning interoperable components that execute operational elements, assigned tasks, and information flows required to fulfill a set of user requirements.

3.1.11 Documentation

This Task ensures development and maintenance of the pre-specification, pre-conformant interoperable OGC technologies (including draft and final Engineering Reports) and the systems level documentation (example user documentation, etc.) necessary to execute the Initiative. This task may include coordination with OGC Specification Program activities.

3.1.12 Compliance Testing

This Task ensures development of draft compliance test guidelines (at a minimum) and test suites for engineering specifications detailed in Engineering Reports. This task includes coordination with the OGC Compliance Program.

4 OGC Testbed 11 Work Breakdown Structure (WBS)

The following Work Breakdown Structure (WBS) is derived from the OGC Interoperability Initiative Process Framework. This WBS should be interpreted in the following manner:

- Items that are grayed out are either IP Team tasks, have already been completed, or are not required for the OGC Testbed 11 Initiative.
- Bold text is a task grouping or subtask grouping.
- Plain text indicates tasks against which proposing organizations should respond.
- Italic text indicates the task explanation (These task explanations are valid only for OGC Testbed 11).

A proposing organization does not have to respond to all tasks below. However bold italic text in the task explanation indicates which tasks are mandatory or conditional. Conditional tasks are those that are mandatory if a selected organization takes on certain non-mandatory tasks.

5 Coordination

5.1 Collaborative Environment

The following tasks are mandatory for selected organizations.

5.1.1 Routine and ad hoc telecons/webinars as assigned

Selected organizations shall provide a technical representative and an alternate to participate in regularly scheduled telecoms/webinars or an ad hoc telecom/webinar.

5.1.2 E-mail review and comment

Selected organizations shall provide technical representatives to participate in specification and prototypical component development discussions via the OGC Testbed 11 mail lists.

5.1.3 Action Item status reporting

Selected organizations shall report the status of their work to the relevant work group leader in response to any action item accepted by them in whole or part.

5.2 Initiative Plan Development

5.2.1 Project Plan Development

5.2.2 Project Schedule Development

5.2.3 WBS Development

5.2.4 Concept of Operations Development

5.3 Management

The following tasks are mandatory for selected organizations.

5.3.1 Status Reporting

Business/contract representatives for selected organizations shall report the progress and status of their work as assigned to and accepted by them in their SOW following a template provided after SOW signing.

A one-time Kickoff status report shall be provided that includes a list of personnel assigned to support the OGC Testbed 11 initiative. The kickoff status report shall be submitted the OGC Testbed 11 Initiative Manager no later than the last day of the OGC Testbed 11 kickoff in soft copy format only.

Weekly or biweekly thread-level teleconferences will be conducted and recorded in minutes posted on the portal, beginning after the Kickoff. These are for verbal updates and additions of tasks and actions listed on the portal, and to respond to requests for status by the IP Team and Sponsors.

*Formal status reports will be submitted on a Monthly basis on the portal for compilation to an overall thread and initiative status. These reports will be due by the tenth of the month or the first Monday thereafter (Geo4NIEM thread will be due not later than the last day of the month as sponsor reporting will be conducted separately. **Additionally, see Annex C section 3.1 for daily reporting requirement for Geo4NIEM)**. Two kinds of status reports are required (report templates will be provided):*

- ***Monthly Technical Report**: Word document posted on portal, and the Thread Architect notified*
  - *Work status overview, by deliverable name and number, with Green-Yellow-Red indicators*
  - *Narrative to describe work accomplished per deliverable during this reporting period by the participant's technical team*
  - *Show % Complete on assigned deliverables within a Participant's SOW (no cost or labor figures)*
  - *Thread Architect will compile these reports into a **Monthly Thread Summary Report**, due by the 15th of each month after the kickoff, and notify the Initiative Manager*
- ***Monthly Business Report**: Word document submitted to the IP Executive Director, Initiative Manager, and OGC Business Manager*
  - *Work status overview, by deliverable name and number, with Green-Yellow-Red indicators*
  - *Accomplishments (% completion in work and dollars)*
  - *Expenditures, such as labor and Other Direct Costs – budgeted, actual, projected, and cumulative totals*

- *Identification of potential technical performance and/or cost issues and risk mitigation*
- *Summary of work expected to be performed during the next period*
- *The final monthly report shall be an overall **Participant Summary Report**, summarizing the Participant's overall contribution to the project*

5.3.2 Initiative Accounting

Cost-share compensation to selected organizations is typically invoiced and paid in three bi-monthly installments. The dates of these installments for OGC Testbed 11 will be identified in the Participant Agreement.

Business/contract representatives for selected organizations shall submit an invoice to the OGC Business Office at OGC Headquarters. The invoice shall include the OGC Accounting Job Code provided in the contract, the work completed during the prior period, and itemized list of Deliverables. The invoice shall include the budgetary not to exceed amount.

5.4 Communication

5.4.1 OGC Internal IP Status Briefings

5.4.2 OGC External IP Status Briefings

6 Assessments and Analysis

6.1 Organizational Capability Review

6.2 Organizational OGC Requirements Review

7 Concept Development

7.1 Sponsor Feasibility Study Review

7.2 RFT Development

7.3 RFT Response Analysis

7.4 RFT Response Review

8 Architecture Development

8.1 Enterprise View Development

8.2 Information View Development

8.3 Computational View Development

9 Initiative Preparation

9.1 Sponsor Planning TEMs

9.2 RFQ Development

9.3 Participant Budget Development

9.4 Contract Development

9.5 SOW/SOP Development

10 Specification Development

All selected organizations shall send technical representatives to the OGC Testbed 11 Kickoff meeting. Technical representatives of selected organizations shall lead Specification Development effort for each or applicable tasks listed below.

10.1 Model Development

Representing a service, interface, operation, message, or encoding that is being developed for the OGC Testbed 11 initiative.

10.2 Schema Development

Specifying an interface that is being developed for the OGC Testbed 11 initiative.

10.3 Encoding Development

Specifying an interface that is being developed for the OGC Testbed 11 initiative.

10.4 Interface Development

Specifying operations, encodings or messages that are being developed for the OGC Testbed initiative.

10.5 Specification Program Coordination

Submitting Engineering Reports (ER's) developed in OGC Testbed 11 to the OGC Technical Committee for review; and presenting Reports to relevant OGC TC groups and working with members to resolve issues that the members may raise with regard to the ER.

11 Component Development

Technical representatives of selected organizations shall lead Component Development effort for each or applicable tasks listed below.

11.1 Prototypical Interoperable Software Development

11.1.1 Server software development

Selected organizations shall develop server software or modify existing product server software to exercise the interfaces developed under the Specification Development tasks in item 10 above. The selected organizations will make this server software available for sponsor review and input during the initial period of the OGC Testbed 11 initiative.

11.1.2 Client software development

Selected organizations shall develop client software or modify existing product client software to exercise the servers developed under the Component Development tasks of the OGC Testbed 11. Selected organizations shall develop client software to support their server software or make arrangements with other participants to use their client software to exercise their server during the course of the initiative. This is subject to approval by the sponsors and IP Team to ensure that the third party client is appropriate for exercising the functionality of the relevant server. If the proposing organization is developing server software and client software, then the client software shall exercise other OGC Testbed 11 or OGC services provided by their server.

11.2 Special Adaptation Development

Selected organizations shall adapt client or server software to exercise relevant mainstream IT technology and standards such as PKI and e-commerce technologies.

12 Testing and Integration

12.1 Configuration Management

12.1.1 CM Plan Development

Selected organizations shall provide a representative to develop a configuration management plan for interfaces and components developed during the OGC Testbed 11 initiative.

12.1.2 Initiative CM

Selected organizations shall provide a representative to exercise the configuration management plan for interfaces and components developed during the OGC Testbed 11 initiative.

12.2 Infrastructure Setup

12.2.1 Operating Systems

12.2.2 Networks

12.2.3 Web Server

12.2.4 Database Server

12.2.5 Web Browsers

12.2.6 SW Installation & Integration

12.2.7 Data Loading

12.3 Technology Integration Experiments

12.3.1 Iterations 1-N

12.3.1.1 Component Interface Test

Selected organizations shall provide a technical representative to conduct formal Technology Integration experiments that exercise server and/or client component software's ability to properly implement the interfaces, operations, encodings, and messages developed during OGC Testbed 11. There will be multiple TIEs as well multiple iterations of a particular TIE or set thereof during the testbed. ***This item is mandatory for all organizations proposing to deploy components for OGC Testbed 11.***

12.3.1.2 Test Result Analysis

Selected organizations shall provide a technical representative to report the outcome and relevant software reporting messages from TIEs in which the proposing organization participates. These TIE results shall be shared with the OGC Testbed 11 team and reported within Monthly Status Reports. ***This item is mandatory for all organizations proposing to develop deploy components for OGC Testbed 11.***

12.4 System Tests

12.4.1 Functional Test

12.4.2 Interface Test

12.4.3 Performance Test

13 Solution Transfer

13.1 Software Installation

Selected organizations shall provide a licensed copy of OGC Testbed 11 relevant software components for integration onto the OGC Network. This could be accomplished by making the software component(s) available from an open site on their network OR by installing it on a sponsor or other host machine on the

OGC Network. If the latter option is taken, then the selected organization shall provide a technical representative to support the installation of the software component(s). ***This is mandatory for all organizations proposing to develop software components for OGC Testbed 11.***

13.2 Software Integration

13.3 Data Loading

Selected organizations shall provide a technical representative to load data to any server components the proposing organization may develop. ***This item is mandatory for all organizations proposing to develop server components for OGC Testbed 11.***

14 Demonstration

14.1 Use Case Development

Selected organizations shall provide a technical representative to develop or support the development of use cases that define and explain the utility of the interfaces developed during OGC Testbed 11. These use cases shall be used to provide a basis for demonstration storyboards and the demonstration itself.

14.2 Storyboard Development

Selected organizations shall provide a technical representative to develop or support the development of the demonstration storyboards that will define the structure and content of the demonstration.

14.3 Venue Access

14.4 Data Requirements Assessment

14.5 Data Acquisition and Distribution

14.6 Demonstration Preparation and Delivery

Selected organizations shall provide a representative to develop or support the development of demonstration that will exercise the functionality of the interfaces developed during OGC Testbed 11. The representative(s) will also support the demonstration event(s) as required. Selected organizations will maintain server and client software for a period of no less than one year after the completion of the OGC Testbed 11 demonstration. ***This item is mandatory for all organizations proposing to develop software components for OGC Testbed 11.***

15 Documentation

15.1 ER Development

Selected organizations shall provide a technical representative to serve as editor of, reviewer of or contributor to a relevant Engineering Report (ER) (or subsection of an Engineering report).

In some cases, the documentation required is a Change Request to an existing OGC standard. All Change Requests are to be entered into the public, online CR system, found here:
http://www.opengeospatial.org/standards/cr

15.2 System Documentation Development

15.2.1 Functional Specification

15.2.1.1 Architectural Overview

Selected organizations shall provide a technical representative to develop an architectural overview of their software component(s) relevant to the OGC Testbed 11 architecture. ***This item is mandatory for all organizations proposing to deploy server interfaces for OGC Testbed 11.***

15.2.1.2 Use Cases

Selected organizations shall provide a technical representative to develop use cases to show the functionality of their software components in the context of the OGC Testbed 11 architecture. ***This item is mandatory for all organizations proposing to deploy server interfaces for OGC Testbed 11.***

15.2.1.3 UML System Models

Selected organizations shall provide a technical representative to develop valid UML documents describing information models and architectures involved in their contribution to OGC Testbed 11. ***This item is mandatory for all organizations proposing to develop schema automation components for OGC Testbed 11 to be installed at sponsor or other host sites connected to the OGC Network.***

15.2.1.4 System Configuration

Selected organizations shall provide a technical representative to develop a detailed document describing the combined environment of hardware and software component(s) that compose their contribution to OGC Testbed 11. ***This item is mandatory for all organizations proposing to develop software components for OGC Testbed 11 to be installed at sponsor or other host sites connected to the OGC Network.***

15.2.2 Installation Guide

Selected organizations shall provide a technical representative to develop an installation guide for their software component(s). ***This item is mandatory for all organizations proposing to develop software components for OGC Testbed 11 to be installed at sponsor or other host sites connected to the OGC Network.***

15.2.3 Training Material & Users Guide

Selected organizations shall provide a technical representative to develop a User's Guide and Training Materials pertaining to their software component(s) developed or modified for OGC Testbed 11. ***This item is mandatory for all organizations proposing to develop software components for OGC Testbed 11****.*

15.3 Planning Study Report

16 Compliance Test Development

Technical representatives of selected organizations shall develop draft compliance test documentation pertaining to an interface developed or enhanced for OGC Testbed 11. For candidate specifications, this test documentation shall, at a minimum, consist of test guidelines that would form the basis for development of more detailed and complete test scripts as the specification matures toward an approved specification. For mature candidate specifications, participants shall evolve existing or prepare test scripts to form a complete set of tests to fully test an implementation of a specification for compliance with its requirements. Compliance test documentation shall be included in an Engineering Report. This task includes coordination with OGC Compliance Program.

16.1 Summarize TIEs, demo results and data issues

Technical representatives of selected organizations shall include information detailing progress pertaining to the implementation of the interface by including TIE results, lessons-learned from the demo, and particular data issues.

16.2 Compliance Test

Technical representatives of selected organizations shall outline all of the necessary information to conduct a valid compliance test of the interface, including the sub items below.

16.2.1 Test Cases

Technical representatives of selected organizations shall outline a valid compliance test for the interface. A valid compliance test will include identification of all required and optional server requests in the interface, the acceptable results for testing servers, the syntax checks to perform for testing client requests; an explanation of an acceptable verification of the results (machine, human, etc); a list of expected/valid warnings or exceptions to interface behavior; a matrix of test dependencies and explanation of ordering tests appropriately for inherent tests and dependencies.

16.2.2 Data

Technical representatives of selected organizations shall identify appropriate data sets for use in conducting a compliance test for an interface.

16.2.3 Recommendations

Technical representatives of selected organizations shall document recommendations to resolve issues with the current state of the interface, or with the compliance tests.