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Request for Quotation (RFQ)

And

Call for Participation (CFP)

OGC Web Services Initiative - Phase 6 (OWS-6)

Annex C

OWS-6 Concept of Operations

RFQ Issuance Date: July 21, 2008

Proposal Due Date: September 5, 2008

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1   Introduction

This Annex is an integral part of the OWS-6 RFQ. It describes the Concept of Operations for the OWS-6 Web Services Initiative (OWS-6) which is organized with five threads. The schedule for this initiative is detailed in the Master Schedule (RFQ/CFP Main Body, Section 4.6):

(1)   Proposal Development - During this period, OGC to develop draft management and communication plans for the OWS-6 initiative operational phases and clarify requirements.

(2)   Proposal Evaluation, Selection and Negotiations - During this period, the OGC will analyse responses for funded and unfunded work items for each of the five threads within the WBS described in Annex-A of the OWS-6 RFQ. OGC will communicate with RFQ respondents concerning their proposals, negotiate on their participation for funded and In-Kind Contributions, and communicate the status of the OWS-6 to the OGC Technical and Planning Committees. During this timeframe, Participant Agreements for selected organisations and Statements of Work will be signed.

(3)   Kickoff Meeting. - The Kickoff meeting will be held in the Washington DC area and will last approximately one week. During the Kickoff, the selected organizations and participants will (a) develop generic interfaces and protocols to be used as a baseline for software components, (b) finalize the initial System Architecture, and (c) refine the Demonstration Concept.

(4)   Interface Development, Test, and Refinement - During this period, selected organizations will develop interface components for insertion into testbed, and integrate selected components that support prototype testing and development for the OWS-6 Initiative.

(5)   Interim Milestone – This is a necessary deadline for exchanging draft documents that affect multiple threads of activity, such as secure services architecture choices and other topics as determined by the thread teams during the kick-off. This will not involve a face-to-face meeting but will be held using WebEx and Telecon.

(6)   Demonstration Milestone – This is a preliminary deadline, also to be held by WebEx and Telecon, for submitting draft reports and screen captures of implemented services to date.

(7)   Final Delivery – As this will fall between OGC TC meetings for OWS-6, this event is essentially the close of funded activity, and all final reports and screen captures are due. Further development may take place to refine demonstrations for the upcoming OGC meeting.

(8)   Interoperability Day at OGC TC – At this event, selected organizations will demonstrate the OWS-6 products outlined in WBS to OGC, sponsors, and the community of interest. This will most likely consist of multiple demonstrations highlighting specific product capabilities.

2   OWS–6 Lifecycle Phases

2.1   Proposal Development

Following guidelines are provided to proposing organizations for proposal development:

- Proposing organizations must be members of OGC, or must submit an application for membership in advance of their proposal, to have their proposals considered.

- The OpenGIS Abstract Specification, as well as OpenGIS Interface Specifications, may cover some of the technology areas under consideration in the RFQ. The relationship between the content of the proposal and the relevant OpenGIS specifications should be noted by the Proposing organizations.

- Proposals with some basis in emerging related international Standards being developed by ISO, OASIS, IEEE, IETF, IAI or other standards development organizations should reference the relevant standard and sections thereof.

- Proposing organizations should plan on performing all development work at their own facilities. These facilities should include a server (where applicable) that is accessible to other testbed participants via the Internet. Technology Interoperability Experiments (TIEs) will be carried out among the participants based on these Internet-accessible servers.

- Proposing organizations should plan on transitioning their components to a Sponsor-provided facility.

- The desired outcomes of the OWS-6 Initiative include additional OpenGIS specifications as well as implementations that become part of the OGC Network infrastructure. Proposals covering technologies that require licensing should indicate how these technologies can be made available as a (permanent) part of OGC Network. Proposals should include description of technologies requiring specific hardware or software environments.

- Proposals need not address the full spectrum of the OWS-6 architecture as outlined in Annex B. Proposals can focus on specific portions of that architecture.

- Proposing organizations should be prepared to build interoperable components and thus should be prepared to cooperate with all selected development teams, regardless of whether individual proposals covered the full OWS-6 architecture or portions of it.

- Software components developed in the OWS-6 initiative should either be based upon currently shipping products, or should be prototypes or pre-release versions of products that the responding organization intends to sell or otherwise distribute for ultimate deployment.

- Responding organizations must participate in the full course of interface and component development, test and integration experiments, and other essential activities throughout the initiative in order to have access to and participate in demonstration exercises.

- Proposal selection and funding may be on the basis of portions of the proposal deemed most likely to lead to a successful OWS-6 implementation.

- Proposal selection and funding for pure specification development will be much more limited than funding for the development of software components, and will be subject to a stringent review. All other submittals are expected to propose component development.

- Proposing organizations should feel free to provide alternatives to the OWS-6 architecture. However, it should be noted that proposals will be selected on the basis of how successfully the various components of all the selected responses interoperate. Radically different architectures that would require intensive rework on the part of a majority of the selected organizations participants would have to be supported by cost/benefit analysis.

- Proposing organizations should be familiar with the existing OGC Network infrastructure. OGC Network provides a set of services, datasets, components, toolkits, and reference materials that can and should be used to leverage OWS-6.

- Proposing organisations shall use the supplied template and forms to complete their proposals.

Those organizations choosing to respond are expected to have representatives available to attend the following teleconferences:

1. Questions Due and Bidders' telecon
2. Confirmation of Proposals received
3. Negotiations with selected organizations.

Furthermore, selected organizations and participants offering In-Kind Contributions should plan to send at least one technical representative to the Kickoff meeting.

Specific dates for the events listed above are provided in the OWS-6 Master Schedule (RFQ/CFP Main Body, Section 4.6)

2.1.1   Management Approach and Communications Plan

The OGC IP Team will apply its standard management approach, and initiate its communication plan during the period between the release of the RFQ and the submission of the responses. These activities will provide guidance to the OGC IP Team and participants for the conduct of OWS-6.

The management approach for OWS-6, as for other OGC IP initiatives, is outlined in the Interoperability Program Policies and Procedures documents available on the OGC Website[1].. These documents provide details on the following roles and responsibilities of individuals providing management support to OGC initiatives:

1. Sponsor Team—representatives from the organizations that have provided sponsorship for the OWS-6 initiative.

2. OGC Initiative Manager—the OGC staff person responsible for the overall management of the OWS-6 initiative.

3. Demonstration Manager —the individual responsible for planning and managing the Demonstration activity of the OWS-6 initiative.

4. Architecture—the individuals responsible for the overall initiative architecture during the course of the OWS initiative.

5. Marketing—the individual responsible for the marketing aspects of the OWS-6 initiative.

6. Interface Team—a team of individuals representing all of the participants that are engaged in component development and representing sponsor organizations. The primary task of this team is to develop component interface and protocol definitions, implement components, revise interface and protocol definitions, and evolve the Initiative Architecture.

7. Demonstration Team—a team of individuals representing all of the participants and sponsoring organizations that are engaged in demonstration, testing, or data provision. The primary task of this team is to prepare scenarios for demonstrations, design tests that exercise the components, perform data development in support of these scenarios, build demonstrations and tests, and evolve the Demonstration Concept.

8. OGC IP Team—a group composed of the OGC Initiative Manager, Architecture, Demonstration Manager, and Marketing.
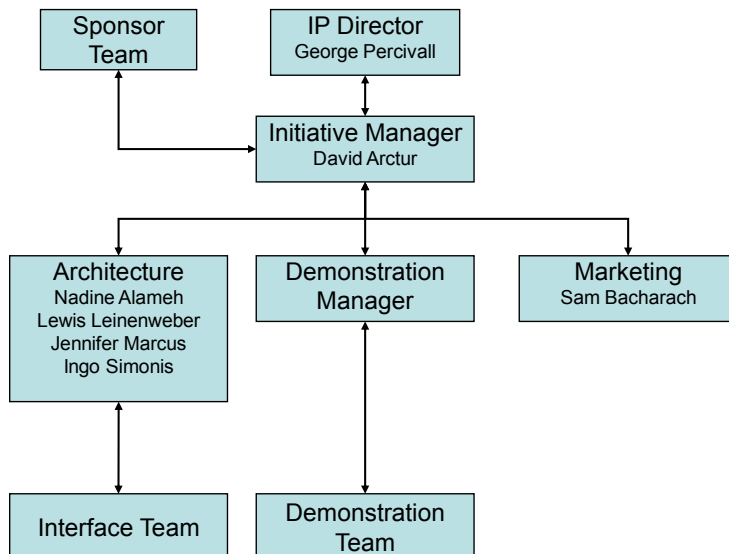
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[1] http://www.opengeospatial.org/ogc/policies/ippp

Figure 1: OWS-6 Initiative Organization Chart

The Communications Plan, included in this RFQ as Annex D, details resources and procedures for reporting and exchanging information with participants, relevant working groups (WGs), Technical Committee, Planning Committee, Strategic Member Advisory Committee, and sponsors. This plan includes the development of a Web page with appropriate documents and regular updates to OWS-6 information. The OGC IP Team will provide a list server for participants to exchange project-relevant e-mail. A teleconferencing plan will be developed to further support communications among participants.

2.1.2   Letter of Intent and Contract Execution

Respondents to this RFQ must include a signed letter of intent (LOI) with their submittal. The LOI must state that if they are selected for inclusion in the OWS-6 Initiative, and they elect to participate, then they will sign a Statement of Work (SOW) or a Statement of Participation (SOP) by the end of the Negotiation Period. These contracts, also to be signed by OGC, will contain common vision and goal statements, will be an agreement to work toward these goals, and will define the roles and responsibilities of the participants. Respondents who do not submit a signed SOW or SOP by the end of the Negotiation Period will not have access to the testbed.

2.2   Proposal Evaluation, Selection and Negotiations

The OGC IP Team and Sponsors will review the RFQ responses beginning immediately after the deadline for submission. During the analysis process the OGC IP Team may need to contact proposing organizations and participants for clarification and to understand the recommended Initiative Design and Demonstration Concept. The process leading up to the Kickoff meeting is detailed in the following paragraphs.

2.2.1   Component and Requirement Analysis

The review team will accomplish the following tasks:

1. Analyze the components proposed in the RFQ responses in the context of the OWS WBS found in Annex A.

2. Compare the proposed efforts with the requirements of the initiative and determine viability.

3. Assess the feasibility of the RFQ responses against the use cases.

4. Analyze proposed specification development

5. Analyze proposed testing methodologies, including but not limited to performance testing methodologies.

2.2.2   Initiative (System) Architecture Recommendation

The proposal review team will then draft a straw system architecture, which will include the set of proposed components for development within the initiative, and relate them to the hardware and software available. Any candidate interface and protocol specifications received during the RFQ process will be included with the draft initiative architecture as annexes.

2.2.3   Demonstration Concept Recommendation

The proposal review team will incorporate the preliminary analysis of responses into a demonstration concept recommendation. This document will discuss the ability of proposed software components to work together in a demonstration context, and will identify gaps.

In the case of proposals for demonstration and database development tasks, proposed databases that are applicable to the testbed, and the details of their contents, will be listed. The review team will evaluate the ability of the proposed databases to support a demonstration in the context of anticipated scenarios, and will develop an estimate of the effort required to develop metadata for the proposed data sets. Respondents are encouraged to provide as much information in this regard as they have available.

The proposal review team will also construct a listing of database compatibility and related issues (accuracy, scale, coordinate system, data type), to inform the scenario development process, and will develop early recommendations regarding the applicability of the databases with respect to demonstration scenario support.

The demonstration concept document will include references to existing and emerging resources on OGC Network, including the resources under development in this testbed. The OWS-6 initiative will culminate in a sponsor demonstration. The current intent is for this demonstration to be accomplished in a distributed fashion and to consist of multiple demonstrations highlighting specific objectives.

2.2.4   Decision Technical Evaluation Meeting (TEM) I

At Decision Technical Evaluation Meeting I, OGC IP Team will present to the sponsors (with the Component and Database Analyses as background):

- The Initiative (System) Architecture Recommendation, and

- The Demonstration Concept Recommendation.

This presentation will be made in the context of first drafts of the plans described above:

- Communications Plan

- Sponsor requirements

The primary decisions to be made by the sponsors at this TEM are:

- Is the recommended Initiative Architecture workable? If not, how to make it workable.

- Which RFQ responses, or subset thereof, should be provided cost-sharing funds and at what level given all inputs?

- Is the Demonstration Concept workable? If not, how to make it workable.

- Are the management approach and the Communications Plan reasonable and complete?

Immediately following Decision TEM I, OWS Initiative staff will begin to evaluate sponsor recommendations to the various plans and will revise the plans and concepts accordingly. It will also make budgetary adjustments based on sponsor inputs.

2.2.5   Decision TEM II

At Decision Technical Evaluation Meeting II, the OGC IP Team will present to the sponsors:

- The Initiative (System) Architecture Revision, and

- The Demonstration Concept Revision.

- The Participant Recommendation

The primary decisions to be made by the sponsors at this TEM are:

- Is the revised Initiative Architecture workable? If not, how to make it workable.

- Is the Participant Recommendation correct and affordable?

- Is the Demonstration Concept workable? If not, how to make it workable.

- Are the management approach and Communications Plans reasonable and complete?

Immediately following Decision TEM II, the OGC IP Team will 1) finalize the Initiative Architecture and Concept of Operation (now including the Demonstration Concept), 2) begin to insert specific information into the existing purchase order template for each targeted participant organization, and 3) make the insertions of specifics for all participants into a contract template. Each targeted respondent POC should be available or make arrangements for alternates during this period. The output of Decision TEM II will be a final Initiative Architecture and Demonstration Concept. Proposing organizations that have been selected for funding will be notified after the completion of Decision TEM II.

2.3   Kickoff Meeting

OWS-6 will be launched officially with the start of the Kickoff meeting in the Washington DC area (exact location to be announced). Prior to the Kickoff meeting all the participants will sign a Contract, as indicated above, that includes a description of the assigned work items in Annex A of the OWS-6 RFQ.

The Kickoff meeting will address two development activities in the OWS process: (1) component interface and protocol definitions, and (2) demonstration scenario development. The scenarios used in OWS-6 will be derived from those presented in the RFQ and other candidates provided by OGC and the sponsors.

The two development activities will interact and affect each other, and the interaction will be iterative. During the Kickoff, both activities will be jump-started using the preliminary specification development performed by the IP Team and the Sponsors, and other assets that participants bring to OWS-6. Participants will be asked to volunteer to address any perceived shortfalls. The Initiative Manager will lead daily plenary meetings for the exchange of information.

An additional product of the Kickoff meeting will be a development schedule that defines specific milestones in the Interface Development and Demonstration Development activities. These milestones will include component-to-component interactions across the interfaces under development, and component insertion into demonstration scenarios. Among the milestones will be Technology Integration Experiments. The TIEs will be conducted on a planned basis during the Specification Development activities (See Annex A WBS task items 6 and 8.3). Participants providing software components based upon draft specifications developed during the course of the OWS-6 Initiative shall participate in relevant TIEs (See WBS task item 8.3 and related sub-tasks for details).

At the Kickoff meeting, there will be technical breakouts to begin developing component interface definitions for the OWS. The responding organizations and companies are expected to have systems and/or

software engineers in attendance to assist in the initial assessment and interaction of the interfaces. This may include UML modeling of the interfaces, using a standard tool such as Visio or Rational Rose. Use cases will be made available to the demonstration development team, and the interface definition team should incorporate in their own analysis use cases provided by the demonstration development team. As a way of validating the interfaces, they will be "exercised" against the demonstration scenarios during a plenary session.

Simultaneously, there will be technical breakouts at the Kickoff meeting to begin demonstration scenario design and creation. This activity will involve the development of use cases to explore the implications of the scenarios to OWS-6. These use cases should be made available to the interface development team, and demonstration developers should incorporate in their own analysis the use cases provided by the interface development team. The participants in this activity should understand that various databases will be proposed as solutions to the RFQ. This group will apply the use cases to the development of storyboards based on the proposed databases. To facilitate this activity a presentation will be created which maps, physically and systematically, the component databases being used in the scenario. The scenario design must account for the requirements and dependencies of the overall OWS-6 system, including any Client designs, any Server designs, and service interfaces.

There will be technical plenary sessions conducted during the course of the Kickoff meeting. These are intended to allow the participants working on interface and protocol definitions to interact with those participants working on scenario vignettes and demonstration development. These plenaries will use UML use case and UML sequence diagrams to assess the interaction of the scenario and demonstration development and the interface definition effort.

2.4   OWS-6 Interface and Demonstration Development

This section defines an initial concept for the conduct of development activities in OWS-6 RFQ. Figure 2 lays out a notional schedule for the OWS-6 Initiative. The actual schedule and further information will be provided at the Kickoff meeting.
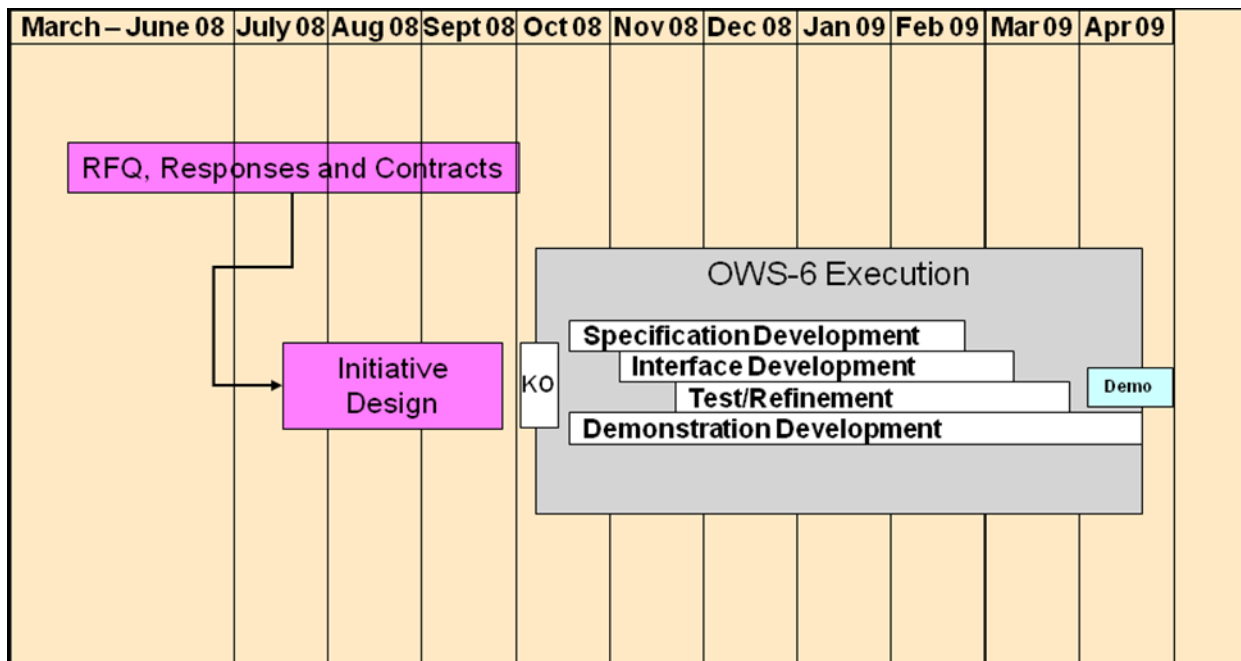

Figure 2 – Notional Schedule for OWS-6

2.4.1   Interface Development

This Interface Development (ID) Phase corresponds with WBS Tasks 6, 7 and 8 and their related sub-tasks. The schedule and further information will be provided at the Kickoff meeting.

During the ID phase, the Technical Architecture (System Architecture) will be refined while groups of participants work on development of specific components. This work will be shaped by the Scenario and Data Development tasks. By this time, demonstration details will have been sufficiently well defined to isolate key actions and behaviors of "actors" in the scenarios, which should in turn provide clear, measurable, short-term goals for the technical development teams to pursue. The technical implementation teams will also provide feedback to the demonstration scenario and data preparation teams. This mutual interaction will allow problems and successes to surface early, and will guide early TIEs, without waiting until Demonstration Integration and testing time (See WBS task item 8 and related sub-tasks). Demonstration Integration and Testing will integrate already tested interfaces into a larger, cohesive unit capable of supporting the end-to-end nature of the scenarios.

Technology Integration Experiments (TIEs) will be conducted on a regular basis, in an iterative manner, as outlined by the initiative architects in the development schedule. During identified TIE phases of the initiative, participants developing components within the Testbed Architecture shall test interfaces for component accessibility, behavior, and most important, interoperability. The IP Team will develop a TIE matrix defining the nature of TIEs that shall be conducted and their scheduled occurrence within the initiative. Participants will report the outcome of each TIE following the TIE reporting template provided by IP Team.

TIEs will be conducted within the development cycle of the Initiative. TIEs will follow initial interface design, interface construction, component creation, and integration of the interface with application logic. For iteration of the TIE, server components under test shall have data loaded to allow client software to exercise the current functionality. Participants working behind firewalls shall take any necessary steps to allow the test to be conducted through the firewall or outside of the firewall. All participants are expected to provide appropriate documentation to allow the successful conduct of these experiments. All participants are expected to upload a reference to their components to the Initiative web site for iteration of TIE. Participants shall report the outcome of TIEs to the OWS list and the Initiative Architecture Team.

To the extent possible in an initiative of this duration, interface definition, software development, and test will follow the spiral development paradigm. In particular, issues exposed in each round of TIEs will drive requirements for the following round of specification (interface definition) refinement, coding, and test. The development cycle may also proceed incrementally, with primary attention on a limited set of operations at each turn of the cycle. This approach may require more closely coordinated interactions among participants than in previous OGC initiatives.

The Technical Architecture in Annex B describes an initial set of services and interface mechanisms. It also contains a notional System Architecture. Individual items in that notional System Architecture are to be refined during the Kickoff meeting and will be further refined during the ID phase. Consistent with the spiral development paradigm, it is intended that there be periods of development followed by periods of synchronization between the various component developers. This will allow for issues to be resolved and documented before divergence begins to occur between individual component developers (i.e., two server developers) and between dependent component developers (i.e., server and client developers).

2.4.2   Demonstrations

This section builds upon the initiative characteristics developed during the Kickoff demonstration scenario design and creation discussions. To be successful, participants must execute four activities—designing a demonstration, building a demonstration, testing the demonstration, and packaging the demonstration on portable media.

Capitalizing on the Use Case and UML work performed at the Kickoff, participants need to expand these initiatives in four design areas—completing demonstration storyboards, finalizing specification considerations, identifying data providers, and incorporating support databases.

- Review and Finalize Storyboards—participants identify the relationships between the data, the sponsor scenarios, and the components.

- Finalize Interface Definition Considerations—given the experimental nature of work during a testbed, some inconsistencies may remain between specifications and interfaces, and between different implementations. Participants must expose these conflicts and develop appropriate solutions.

- Survey Supporting Database Providers—access to the appropriate data is essential to exercising the initiative architecture and capturing a representative demonstration. Participants clearly must assure that the appropriate data exist and are available.

  - Determine Nature and Extent of Holdings—as mentioned previously, OGC Implementation Specification conformant data sources are preferred. However, the most important issues are the quality, availability, and interoperability of the datasets.

  - Manage Supporting Data—On-line supporting data require that the participants identify the data stores, availability, throughput limitations, and ingestion process. Successful execution of data pre-staging will require the participants to have a data plan, so valuable time is not lost due to poor planning and preparation.

- Incorporate Supporting Databases—based on the data plan, participants must identify how data will migrate into initiative database components to be exercised for the demonstration.

The design activities will be used by the participants to build and implement prototypes that clearly demonstrate the capabilities of the components by exercising the sponsors' scenarios. As a core requirement of the testbed effort, the sponsors have requested that all demonstrations be made available via the Internet, either for presentation purposes, or for use in their internal labs (See WBS task items 9, 10, and 11.2 and their related sub-tasks). The component elements of the demonstrations include but are not limited to the following:

1. All Executables
2. All Necessary Links and Datasets
3. Supporting Documentation, Installation Instructions, Scripts, etc.

Participation in demonstration exercises is predicated upon full engagement with development, testing, and planning activities throughout the OWS-6 initiative.

2.5   OGC Network Integration and Solution Transfer

The OGC Network Integration will be complete when the interfaces and demonstrations developed during the Interface Development and Demonstration Development have been integrated into the OGC Network initiative infrastructure. This activity will result in configuration-controlled components that are considered stable enough to use in ongoing demonstrations, pilots, and further test bed activity.

Solution Transfer entails the installation of software components developed during the testbed at a Sponsor facility. This task will be complete when sufficient documentation or instruction has been provided, and adequate licensing procedures completed, to allow the Sponsor organizations to exercise and evaluate these products or product prototypes.

3   Progress Reporting

The OGC IP Team will provide monthly progress reports pertaining to the current status of the OWS-6 initiative to the sponsors. The OGC IP Team and the sponsors intend to provide regular status reports about the program to the OGC Technical Committee, Planning Committee, and the OGC Strategic Member Advisory Committee. Currently the OWS-6 lead up activities and development phase will coincide with two OGC Technical Committee and Planning Committee meetings. At that time the participants will present interface designs to the TC. Demonstration scenarios and the architecture to support those demonstrations will be included in the presentation.

4   Integrated Initiatives

Other ongoing IP activities may present opportunities to support OWS-6 and be coordinated with the activities within OWS-6. Any such resources and related activities may be integrated with those of OWS-6 in order to take advantage of economies of scale, and possibly to explore the deployment of innovations coming from OWS-6.

5   OWS Resource Plan

The OWS Resource Plan is based on Sponsor requirements and funding as defined in Annex A. This RFQ represents the current state of sponsor requirements and funding support for OWS activities. This Tier structure is subject to change as Sponsor funding becomes available.

Funded Requirements are high priority to sponsors with associated funding at levels adequate to provide cost-share funding to selected organizations. Annexes A and B will define these requirements in detail. Only proposed activities that address funded requirements will be considered for cost sharing funds.

Unfunded Requirements are identified by the Sponsors, but do not have associated funding at levels adequate to provide cost-share funding to Participants in near-future. Participants who are interested in providing In-Kind Contributions are encouraged to include the work items and resources in their proposal.

6   OWS-6 RFQ Scope

The purpose of this Request for Quotation is to solicit your proposal in response to a refined set of requirements for the OGC Web Services Initiative Phase 6 (OWS-6). Using the attached template and forms, please submit your technical proposal, your cost sharing request, and your in-kind contribution declaration. Please limit your response to only those elements defined as and associated with OWS-6.