

The Open Geospatial Consortium (OGC®)

Request for Quotation

And

Call for Participation

In the

**GEOSPATIAL ENHANCEMENT FOR THE NATIONAL
INFORMATION EXCHANGE MODEL (NIEM)**

(GEO4NIEM)

Annex A — Development Approach

RFQ Issuance Date: 14 February 2013

Proposal Due Date: 4 March 2013

Table of Contents

1	Introduction	5
2	Interoperability Initiative Process Framework	5
2.1	Tasks	5
2.1.1	Coordination	5
2.1.2	Assessment and Analysis	6
2.1.3	Concept Development	6
2.1.4	Architecture Development	6
2.1.5	Initiative Preparation	6
2.1.6	Specification Development	6
2.1.7	Component Development	6
2.1.8	Testing and Integration	7
2.1.9	Solution Transfer	7
2.1.10	Demonstration	7
2.1.11	Documentation	7
3	Work Breakdown Structure (WBS)	7
4	Concept of Operations	7
4.1	Geo4NIEM Lifecycle Phases	8
4.1.1	Proposal Development	8
4.1.2	Proposal Evaluation, Selection and Negotiations	10
4.1.3	Tasks Initiation Workshop	12
4.1.4	Geo4NIEM Interface and Demonstration Development	12
4.1.5	Geo4NIEM Network Integration and Solution Transfer	14
4.2	Progress Reporting	14
4.3	Integrated Initiatives	14
5	Communications Plan	15
5.1	Overview	15
5.2	Communications Plan Details	15
5.2.1	Geo4NIEM Email Reflector	16
5.2.2	Geo4NIEM Public Web Site and Participant Portal	16
5.2.3	Web-Based Upload Mechanism	17
5.2.4	Geo4NIEM Twiki	18
5.2.5	Teleconference / WebEx Procedure	18
5.3	Progress Reporting	19
6	Interoperability Program Code of Conduct	20
6.1	Abstract	20
6.2	Introduction	20
6.3	Principles of Conduct	20
6.4	Acknowledgements	21
Appendix: WBS Outline		22
1	Coordination	22
1.1	Collaborative Environment	22
1.1.1	Routine and ad hoc telecons as assigned	22
1.1.2	E-mail review and comment	22
1.1.3	Action Item status reporting	22
1.2	Initiative Plan Development	22
1.2.1	Project Plan Development	22
1.2.2	Project Schedule Development	22
1.2.3	WBS Development	22

1.2.4	Concept of Operations Development	22
1.3	Management	22
1.3.1	Status Reporting	23
1.3.2	Initiative Accounting	23
1.4	Communication	24
1.4.1	OGC Internal IP Status Briefings	24
1.4.2	OGC External IP Status Briefings	24
2	Assessments and Analysis	24
2.1	Organizational Capability Review	24
2.2	Organizational OGC Requirements Review	24
3	Concept Development	24
3.1	Sponsor Feasibility Study Review	24
3.2	RFT Development	24
3.3	RFT Response Analysis	24
3.4	RFT Response Review	24
4	Architecture Development	24
4.1	Operational Architecture Development	24
4.2	System Architecture Development	24
4.3	Technical Architecture Development	24
5	Initiative Preparation	24
5.1	Sponsor Planning TEMs	24
5.2	RFQ Development	24
5.3	Participant Budget Development	24
5.4	Contract Development	24
5.5	SOW/SOP Development	24
6	Specification Development	24
6.1	Model Development	25
6.2	Schema Development	25
6.3	Encoding Development	25
6.4	Interface Development	25
6.5	Specification Program Coordination	25
7	Component Development	25
7.1	Prototypical Interoperable Software Development	25
7.1.1	Server software development	25
7.1.2	Client software development	26
8	Testing and Integration	26
8.1	Configuration Management	26
8.1.1	CM Plan Development	26
8.1.2	Initiative CM	26
8.2	Infrastructure Setup	26
8.3	Technology Integration Experiments	26
8.3.1	Iterations 1-N	26
8.4	System Tests	27
8.4.1	Functional Test	27
8.4.2	Interface Test	27
9	Solution Transfer	27
9.1	Software Installation	27
9.2	Software Integration	27
9.3	Data Loading	27
10	Demonstration	27
10.1	Use Case Development	27

10.2	Storyboard Development	27
10.3	Venue Access	28
10.4	Data Requirements Assessment.....	28
10.5	Data Acquisition and Distribution	28
10.6	Demonstration Preparation and Delivery	28
11	Documentation	28
11.1	ER Development	28
11.2	System Documentation Development	28
11.2.1	Functional Specification	28
11.2.2	Installation Guide.....	29
11.2.3	Training Material & Users Guide	29
11.3	Planning Study Report	29
12	Compliance Test Development	29
12.1	Summarize TIEs, demo results and data issues	29
12.2	Compliance Test.....	29
12.2.1	Test Cases	29
12.2.2	Data.....	29
12.2.3	Recommendations.....	30

- **Collaborative Environment** - OGC IP Team provides synchronous and asynchronous collaboration environments for cross organizational, globally distributed, virtual teams working interdependently to execute Initiative Orders Activities under this subtask include reading email and engaging in collaborative discussions including teleconferences.
- **Management** - Services ensuring Initiative Order participants are staying within designated budgets, that the work is progressing according to the agreed schedule, and that the tasks identified in the Statement of Work are executed. Including status reporting.
- **Communication** – Includes communicating ongoing and planned Initiative and Work Item Status to OGC and other organizations such as ISO. This task does not include IP Business Development functions.

2.1.2 Assessment and Analysis

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. This task is implemented during Planning Studies.

2.1.3 Concept Development

This task conducts a Feasibility Study that assesses emerging technologies and architectures capable of supporting eventual Interoperability Initiatives (e.g. Pilot, Testbed). Part of the concept development process is the use of a Request for Technology (RFT) 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 pilot or testbed and potential demonstration. This task also collates Sponsor requirements and assesses the applicability of current specifications.

2.1.4 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). Part of the Architecture Development task may be the use of an RFQ issued to industry to enable organizations interested in participating in an Interoperability Initiative to respond with a proposal. This task may also be implemented during Planning Studies.

2.1.5 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.

2.1.6 Specification Development

This task defines and develops models, schemas, encodings, and interfaces necessary to realize required Architectures and includes specification Pre-design and Design tasks. This task may include activities to coordinate ongoing Initiatives with Specification Program activities.

2.1.7 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.

2.1.8 Testing and Integration

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

2.1.9 Solution Transfer

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

2.1.10 Demonstration

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

2.1.11 Documentation

This Task ensures development and maintenance of the pre-specification; pre-conformant interoperable OpenGIS technologies (including Draft Interoperability Program Reports and Interoperability Program 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 including the Documentation Team.

3 Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) provided in the Appendix of this Annex is derived from the OGC Interoperability Initiative Process Framework.

A proposing organization does not have to respond to all tasks in the WBS. However bold italic text in the task explanation indicates which tasks are mandatory or conditional. Conditional tasks are those that are mandatory if a proposing organization takes on certain non-mandatory tasks. All responses shall use this WBS to structure their responses. Evaluations of responses will be based on whether a proposal addresses the WBS task items. So an organization anticipating working on a particular task that fails to indicate their intent by using the WBS structure below will not be considered for the desired task. The Geo4NIEM project plan and schedule will use this WBS as a template as well.

4 Concept of Operations

This section describes the Concept of Operations for the Geo4NIEM Initiative. It is organized around eight particular time frames or phases. The phases are:

- Proposal Development — the time during which RFQ respondent proposals will be developed. This time will also be used by the OGC to develop draft management and communication plans for the initiative operational phases.
- Proposal Evaluation, Selection and Negotiations — During this period, the OGC IP Team will analyze responses for funded and unfunded work items in the WBS described in Section 3 of this Annex A. OGC will communicate with RFQ respondents concerning their proposals, negotiate on their participation for funded and In-Kind (unfunded) Contributions, and communicate the status of the Geo4NIEM Initiative with Sponsors and the OGC Technical and Planning Committees. During this time, Participant Agreements with Statements of Work (SOW) will be signed.
- Task Initiation Workshop — the Task Initiation Workshop will be a face-to-face meeting and last approximately two days. During the Workshop, participants will (a) develop generic interfaces and protocols to be used as the starting place for software components, (b) finalize the initial System

Architecture and; (c) refine the Demonstration Concept. Attendance at the Workshop is required by participants.

- Development, Test, and Refinement - During this period, selected organizations will develop or identify supporting software to be used during for analysis and testing of information exchanges, XML schemas and XML instances documents during the the Geo4NIEM Initiative.
- Preliminary Design and Deliverables – This is a milestone established for participants to complete initial draft documents, such as design documents or preliminary service implementations needed for initiative coordination and integration, as determined by IP Team and Participants during the Task Initiation Workshop. This Milestone activity may be conducted using WebEx and Telecon.
- Demonstration Milestones – A Milestone is established for submitting draft engineering reports and demonstration material prepared to date. These preparations are typically organized and coordinated among Participants according to architecture dependencies to achieve integration of components, support demonstration and final delivery.
- Final Delivery – This milestone is the close of funded activity, when all final reports and demonstration materials are due. Further development may take place to refine demonstrations for placement for public viewing on the OGC website, or for subsequent OGC meetings.

4.1 Geo4NIEM Lifecycle Phases

4.1.1 Proposal Development

4.1.1.1 Proposing Organization Activities

The following guidelines are provided to proposing organizations concerning proposal development:

- Proposing organizations must be members of OGC, or must submit an application for membership if their proposals are accepted.
- The OGC Standards will cover some of the technology areas under consideration in the RFQ. The relationship between the content of the proposal and the relevant OGC standards should be noted by the Proposing organizations.
- 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 participants via the Internet. TIEs will be carried out among the participants based on these Internet-accessible servers.
- The immediate outcomes of the Geo4NIEM Initiative include Engineering Report(s), which may become new OGC specifications or Best Practices; or implementations that become part of the OGC Network. 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 Geo4NIEM architecture as outlined in Annex B. Proposals can focus on specific tasks or portions of that architecture.
- Proposing organizations should be prepared to build interoperable components and thus should be prepared to cooperate with other participant development teams, regardless of whether individual proposals covered the full Geo4NIEM architecture or portions of it.
- Software components developed in the Geo4NIEM 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 awarded on the basis of portions of the proposal deemed most likely to lead to a successful Geo4NIEM implementation.
- Proposing organizations may propose to provide alternatives to the Geo4NIEM architecture. However, it should be noted that proposals would 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 participants would have to be supported by cost/benefit analysis. Advance coordination with affected participants to present a coherent, realistic, and reasonable approach will greatly improve chances of acceptance by the proposal review team.
- Proposing organizations should be familiar with the existing OGC Network. OGC Network provides a set of services, datasets, components, toolkits, and reference materials that can and should be used to leverage Geo4NIEM.
- Proposing organizations shall use the supplied template and forms to complete to their proposals.

Organizations choosing to respond to this RFQ/CFP are expected to have representatives available to attend the following teleconferences:

1. Questions Due and Bidders' teleconference
2. Negotiations with selected organizations.

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

Specific dates for the events listed above are provided in the Geo4NIEM Master Schedule (RFQ/CFP Main Body, Section 4.)

4.1.1.2 Management Approach and Communications Plan

The Geo4NIEM IP Team will apply the standard OGC Initiative 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 Geo4NIEM Team and participants for the conduct of Geo4NIEM.

The management approach for Geo4NIEM, as for other OGC IP initiatives, is outlined in the Interoperability Program Policy and Procedures documents available on the OGC Website¹. 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 Geo4NIEM initiative. Note that some sponsor organizations may also provide components in the initiative, effectively acting as participants.
2. OGC Initiative Manager—the OGC staff person responsible for the overall management of the Geo4NIEM initiative.
3. Initiative Architect—the individual(s) responsible for the overall initiative architecture during the course of the initiative.
4. Participants — Organizations that provide the development and demonstration effort of the initiative. Participants develop component interface and protocol definitions, implement components, revise interface and protocol definitions, and evolve the initiative architecture. Participants prepare scenarios

¹ <http://www.opengeospatial.org/ogc/policies/ipp>

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.

5. Demonstration Manager—the individual responsible for planning and managing the Demonstration activity of the Geo4NIEM initiative – this role may be performed as part of other roles.
6. Marketing—the individual responsible for the marketing aspects of the Geo4NIEM initiative.
7. OGC IP Team—a group composed of the OGC Initiative Manager, Initiative Architect, Demonstration Manager, and Marketing.

The Communications Plan, provided in Section 5, provides details on resources and procedures for reporting and exchanging information with participants, relevant working groups (WGs), Technical Committee (TC), Planning Committee (PC), Strategic Member Advisory Committee (SMAC) and sponsors. This plan includes the development of a Web page with appropriate documents and regular updates to Geo4NIEM information. The OGC IP Team will provide a email list server for participants to exchange project-relevant e-mail. A teleconferencing plan and online collaboration plan will be developed to further support communications among participants.

4.1.2 Proposal Evaluation, Selection and Negotiations

The IP Team and partners 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 for clarification and to understand the Bidder's proposed Initiative Design and Demonstration Concept. The process leading up to the Kickoff Workshop is detailed in the following paragraphs.

4.1.2.1 Component and Requirement Analysis

The review team will accomplish three tasks:

1. Analyze the elements proposed in the RFQ responses in the context of the WBS.
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.

4.1.2.2 Initiative 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.

4.1.2.3 Demonstration Concept Recommendation

The 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 project, and the details of their contents, will be listed. The review team will evaluate the ability of the proposed databases to support anticipated scenarios, and will develop an estimate of the effort required to develop metadata for the proposed data sets. Bidders are encouraged to provide as much information in this regard as they have available.

The 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 project. The Geo4NIEM 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.

4.1.2.4 Decision Technical Evaluation Meeting (TEM) I

At Decision TEM I, the OGC IP Team will present to the sponsors:

- The Initiative Architecture Recommendation,
- The Demonstration Concept Recommendation,
- Evaluation of the RFQ/CFP responses
- Recommendations for awards of cost-share funding.

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 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, OGC Staff will begin to contact proposing organizations based upon sponsor recommendations. OGC staff will revise plans and concepts accordingly and make budgetary adjustments based on sponsor inputs.

4.1.2.5 Decision TEM II

At Decision TEM II, the OGC IP Team will present to the sponsors:

- The Initiative (System) Architecture Revision
- The Demonstration Concept Revision
- The Participant Recommendation

The primary decisions to be made 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 Team will 1) finalize the Initiative Architecture and Concept of Operation (now including the Demonstration Concept), 2) begin to insert specific information into the SOW template for each targeted participant organization, and 3) make the insertions of specifics for all participants into a Participant Agreement 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.

4.1.3 Tasks Initiation Workshop

The Geo4NIEM project will be launched officially with a Workshop meeting. Prior to the Workshop meeting all the participants must commit to a preliminary Statement of Work (SOW), with the understanding that their SOW may change somewhat during the Workshop, as the participants, architects and sponsors gain better understanding of the project scope, architecture needed, and implementation issues. Immediately after completion of the Workshop, all participants must sign a Contract, as indicated above, that includes a description of the assigned work items in Section 3 of this Annex A, subject to any mutually agreed changes decided during the Workshop.

The Workshop Workshop will address two development activities in the OGC IP process: 1) component interface and protocol definitions, and 2) demonstration scenario development. The demonstration scenarios used in Geo4NIEM 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 Workshop, both activities will begin with a preliminary specification development provided by the IP Team and the Sponsors, and other assets that participants bring to the Geo4NIEM Workshop. Participants will be asked to volunteer to address any perceived shortfalls. The Initiative Manager will lead plenary meetings for the exchange of information.

An additional product of the Workshop 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 (TIEs) that will be planned and conducted during the Specification Development activities (See WBS task items 6 and 8.3).

During the Workshop, participants will nominally organize into two teams to 1) begin developing component interface definitions and use cases; and 2) to begin developing the demonstration scenario and use cases for the Pilot initiative. Use cases and related designs between the interface design and demonstration design activities should be shared and coordinated to ensure they are developed to achieve common objectives based on requirements of the RFQ/CFP. Each selected organization is expected to have systems and/or software engineers attend the workshop to assist in the initial assessment and interaction of the interfaces. This may include UML modeling of the interfaces.

To facilitate communication and common understanding, a presentation will be created which identifies, physically and systematically, the components being used in the initiative scenarios and how they will interface with one another. The scenario design must account for the requirements and dependencies of the overall Geo4NIEM initiative, including client designs, server designs, and service interfaces.

Technical plenary sessions will be conducted during the course of the Workshop. The Plenary sessions are intended to allow participants working on interface and protocol definitions to interact with participants working 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.

4.1.4 Geo4NIEM Interface and Demonstration Development

This section defines an initial concept for the conduct of development activities in Geo4NIEM. The actual schedule and further information will be provided at the Initiative Workshop.

4.1.4.1 Interface Development

This Interface Development (ID) Phase corresponds with WBS Tasks 6, 7 and 8 and their related subtasks. The schedule and further information will be developed and provided at the Workshop.

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. 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 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 each iteration of a 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 each iteration of a TIE. Participants shall report the outcome of TIEs to the Geo4NIEM email 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 Workshop 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).

4.1.4.2 Demonstrations

This section builds upon the initiative characteristics developed during the Workshop 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 work performed at the Workshop, 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 Selection Considerations—given the nature of work during a pilot, some inconsistencies may remain between specifications and interfaces, and between different implementations. Participants must expose these conflicts and develop appropriate solutions.
- Evaluate supporting data—access to the appropriate data is essential to exercising the initiative architecture and capturing a representative demonstration. Participants clearly must ensure that appropriate data exists and is available.
 - Determine Nature and Extent of Holdings—as mentioned previously, OGC Implementation Specification conformant data sources are preferred. Other important issues are the quality, availability, schema, 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 Data—based on the data plan, participants must identify how data will migrate through initiative 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. 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 Geo4NIEM initiative.

4.1.5 Geo4NIEM Network Integration and Solution Transfer

The Geo4NIEM 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 on a pilot basis.

Solution Transfer entails the installation of software components developed during the pilot at a Data Provider facility unless other arrangements have been proposed and agreed. 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 and deploy these products or product prototypes. Solution transfer is not required for all components.

4.2 Progress Reporting

The OGC IP Team will provide monthly progress reports to the Sponsors pertaining to the current status of the Geo4NIEM initiative. 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. Participant presentations to the TC will include presentations on Engineering Reports and Demonstration scenarios.

4.3 Integrated Initiatives

Other ongoing IP activities may present opportunities to support Geo4NIEM and be coordinated with the activities within Geo4NIEM. Any such resources and related activities may be integrated with those of Geo4NIEM in order to take advantage of economies of scale, and possibly to explore the deployment of innovations coming from Geo4NIEM.

5 Communications Plan

5.1 Overview

This section describes the Communications Plan for the Geo4NIEM project. The plan includes a defined OGC approach as well as policies and procedures for effective communications among selected organizations, participants, sponsors, and the OGC Interoperability Program (IP) Staff.

Each organization, regardless of any teaming arrangement, shall provide a designated Point of Contact (POC) who will be available for scheduled communications about Geo4NIEM status. That POC shall identify alternatives that will support the designated POC in scheduled activities and represent the organization as-needed in *ad hoc* discussions of IP issues. The designated and alternative POCs shall provide contact information including their e-mail addresses and phone numbers. All proposals shall include a statement or documentation of their understanding, acceptance, and handling of the communications plan.

OGC will designate technical Team Leaders for activities described in the Work Breakdown Structure for the Geo4NIEM Initiative. The Team Leaders shall work with IP Initiative Management, responsible participants, and the sponsors to ensure that Geo4NIEM tasks/activities are properly assigned and executed. The team leader is accountable for activity and schedule control and team communication. They must also raise issues of concern rapidly and proactively on schedule slippage, resource issues to OGC's management assigned for Geo4NIEM Initiative.

5.2 Communications Plan Details

The following objectives of the communications plan are directed to one or more tasks/activities in the WBS or requirements in Section 3 of this Annex A:

- The need to proactively and rapidly alert participants of events, deadlines, and decisions that affect them,
- The need to keep participants apprised of the status of all participants to ensure coordination and cross-communication,
- The need for participants to post items of interest, status reports, and software for distribution amongst the participants,
- The need for participants who are in remote locations to provide to IP Staff or other participants with software for installation at various support sites, and
- The need for groups of participants to communicate/discuss and resolve ongoing definitional and development issues and related solutions.

The following tools are implemented for use during the Geo4NIEM initiative:

- Interoperability Program **email reflector** (geo4niem@lists.opengeospatial.org)
- **Public project web site** (<http://www.opengeospatial.org/projects/initiatives/Geo4NIEM>)
- Project **Twiki** site for team collaboration
- Web portal (<http://portal.opengeospatial.org/>) with the following modules:
 - **Calendar** for assigning, viewing and coordinating schedules,
 - **Contact list** of participants, staff and other key individuals,
 - **Discussion Forum** for technical discussions,
 - A web-based **file upload** mechanism,
 - **Project timeline** tracking,
 - **Action items** tracking, and

A procedure for arranging, announcing, and executing **teleconferences**.

Each of these tools is described below.

5.2.1 Geo4NIEM Email Reflector

Non-technical electronic mail communications should be sent to the single email reflector for the Geo4NIEM program. This email list is geo4niem@lists.opengeospatial.org. All technical discussions will take place on the email list. Reminders will be issued if the guidelines are not used.

Participants should carefully consider the subject of email. To facilitate sorting, email to this list will automatically contain the Prefix in the Subject line of each message: [Geo4NIEM].

The OGC IP lists get heavy traffic. In order to facilitate efficient handling of that traffic and to reduce redundancy, all replies will go to the list not the sender. OGC is currently using the Mailman Software package to manage and maintain our lists. Mailman allows Geo4NIEM users to customize many preferences, for example, you can change your settings to allow for Mailman to digest the messages per day, to receive “no mail” when you are on vacation, etc.

PLEASE NOTE: the email reflector is not intended for exchanging files with others. A procedure for uploading files to the project web sites is described below. When files are uploaded, automatic notification is sent to participants.

5.2.2 Geo4NIEM Public Web Site and Participant Portal

A portion of the Open Geospatial Consortium web site (in the Interoperability Program area) will be dedicated to communications of the Geo4NIEM effort.

<http://www.opengeospatial.org/projects/initiatives/Geo4NIEM>

Figure 1 shows the initial hierarchy of the Geo4NIEM Participant Web Sites.

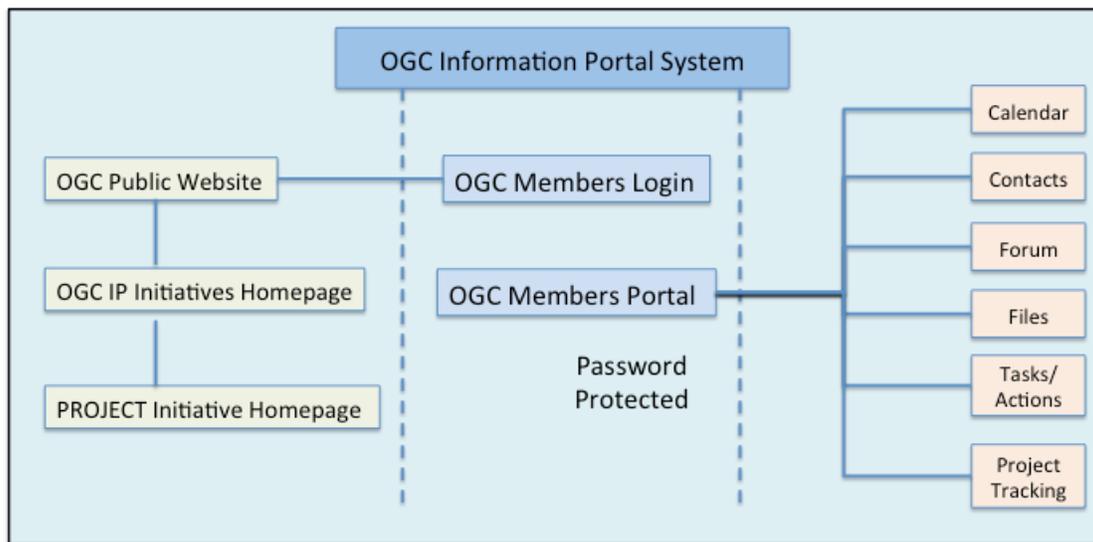


Figure 1—Initial Hierarchy of the Geo4NIEM Participant Web Sites.

The initial pages and their content are described here:

- OGC Information System—Database of important current and historic data regarding everything from requirements and use cases, to contact information and documentation status. There are various levels of access within the OGC Information System. This asset will continue to grow and mature.
- OGC Public Website—publicly available information to help aid in the process of Specification Development.
- OGC Members Page—A valuable resource for all members to get the latest information from the Specification Program.
- OGC IP Initiative Homepage—Links to archived, current and future IP Initiatives:
(<http://www.opengeospatial.org/initiatives>)
- Geo4NIEM IP Initiative Homepage—Home page for the Geo4NIEM Initiative effort:
(<http://www.opengeospatial.org/projects/initiatives/Geo4NIEM>)
- OGC Web Portal - User specific page giving basic tools and information based upon the users Login Access.
- Calendar - Calendar for assigning, viewing and coordinating schedules,
- Contact Information - a listing of the participants, Staff and other Key individuals,
- File Manager - A web-based file upload mechanism,
- Task/Action Items - Action Items tracking,
- Project Tracking - Project timeline tracking,

Although the site will begin with the above layout, it may change and evolve over the life of the Geo4NIEM project. Participants who would like to contribute content to the web site should follow the directions in the next section for submitting material for the Web site.

5.2.3 Web-Based Upload Mechanism

Participants that wish to place materials onto the Geo4NIEM Web Site described above may transfer these materials to any of the file upload locations described in this section. Participants should follow the procedure detailed herein to ensure effective communication of file uploads.

PLEASE NOTE: This is the preferred mechanism for exchanging files with other participants. It prevents those who have no need to receive files from having to do so, while making sure that all parties are informed of the availability of files.

Posting Procedure

1. The participant shall connect to the OGC Web Portal via a personal log-on using a web browser. (<http://portal.opengeospatial.org/>). The participant shall login using their assigned individual Username and Password. If you are a participant or observer, you can request access to the Geo4NIEM project files by contacting the Initiative Manager. Note that Geo4NIEM Observers typically do not have permission to upload files to the Geo4NIEM project directories; contact the Initiative Manager if this is an issue for you. Please ensure that you are logged into the Portal and have selected Geo4NIEM in the drop-down select box on the right end of the top navigation menu.
2. The second tier Navigation Menu has a tab labeled Files. Select this tab. You are now viewing the File Manager Web page for the Geo4NIEM Group.
3. The participant shall upload or submit a single file by selecting the New File tab. File submissions may be packaged (even if only a single file) using **a**) WinZip (for Windows-based submissions) or **b**) tar and Gzip or **c**) tar and compress for (Unix-based submissions).
4. The participant shall in the upload process provide certain metadata for tracking and recognizing the files on-line.
 - a. **Title:** *title of the submission*

- b. **Authors:** *work group or area for which the document was developed*
 - c. **Description:** *or abstract, a paragraph describing the purpose and content of the submission, and*
 - d. **OGC Doc Type:** identify the type of document for the submission,
 - e. **Upload File:** *submitted file to be selected from the submitter's system.*
5. The participant shall click "Go".

5.2.4 Geo4NIEM Twiki

Prior to the Geo4NIEM Task Initiation Workshop, a Twiki site will be established for project collaboration purposes. This Twiki will be a location for group collaboration, preparation and editing of raw content that may (should?) eventually work its way into an ER. When the editor(s) and contributors reach consensus on the form and content of a publication, it should be moved to the Portal where it can be controlled (with versions) in a more formal manner.

5.2.5 Teleconference / WebEx Procedure

In general, any teleconference may involve either or both audio and webcast connections. Geo4NIEM will set up a standing teleconference time each week, with voice line and WebEx (as needed) reserved for the duration of the project. However, participants may occasionally wish to schedule additional teleconferences.

OGC maintains a sufficient number of telephone/audio lines to accommodate several simultaneous teleconferences without conflict. In addition OGC maintains a WebEx account, which may use Voice Over Internet Protocol (VOIP) to avoid international calling charges (all callers must use either VOIP or dial-in telephone line; these cannot be mixed in a single WebEx session). These resources are not for sole use by the Geo4NIEM activities, but are shared with OGC TC working groups, the OGC Planning Committee, Board of Directors, and executive staff. The guidelines below have evolved to ensure productive and efficient use of these teleconference resources.

There are three phases in the execution of a Geo4NIEM Teleconference. These phases are initiation, planning, and execution. The procedure for each phase is defined below.

5.2.5.1 Teleconference Initiation

Due to the need to carefully manage the resources of the IP effort, a teleconference must be appropriately planned and approved by the Initiative Architect and the IP Initiative Manager. Before making a request, always check the Teleconference Calendar on the OGC Web Portal, to avoid obvious conflicts with other scheduled teleconferences. However, depending on the requesting participant's position and access permissions, not all scheduled events may be visible. For example, some OGC committee meetings are only visible to committee members and OGC staff. This is the main reason for following the guidelines below.

An **authorized discussion leader** must lead a teleconference. These individuals are typically identified during the Workshop. However, any participant may initiate a teleconference by first contacting an authorized discussion leader to pre-plan the teleconference.

The authorized discussion leader must then obtain approval from the IP Initiative Manager.

Approval is gained by sending an email with the subject line "IP Teleconference Request" to the Initiative or Operations Manager for Geo4NIEM with the following format and content.

1. **Proposed Date and Time:** the proposed date and time
2. **Purpose:** a description of the purpose of the teleconference

3. **Designated Discussion Leader:** the name, organization, and email of the designated discussion leader (must have been authorized to act in this role previously and must be available for the proposed teleconference)
4. **Participants:** a list of participants (name, organization, and email required) that should be involved
5. **Resources Required:** select one or both of: (a) voice line, and (b) WebEx line
6. **Expected Duration:** an estimate of the expected duration of the teleconference
7. **Agenda:** a detailed agenda, including the time to be spent on each topic

Approval and setup should be sought well in advance, to avoid conflicts over telecon resources, but in any case must be sought **at least two business days prior to the proposed teleconference date**. It is recommended that **teleconferences involving participants on multiple continents** (Australia, Europe, Asia, and North America) **should be scheduled and announced at least three days in advance**.

If the request is approved, the authorized Teleconference Moderator, a member of OGC IP Team will then take over the initiation of the teleconference by entering the meeting information into the portal calendar and reserving the teleconference line.

If the request cannot be fulfilled, the IP Initiative Manager will work with the requesting individual, organization, or group to reach a satisfactory solution to all.

5.2.5.2 Teleconference Planning

The appropriate OGC IP Team member will arrange the teleconference. The details will also be posted in an area of the Geo4NIEM Participant Web Portal. An e-mail to notify all of the listed participants should also be sent.

5.2.5.3 Teleconference Execution

All participants will execute the teleconference by calling at the appointed date and time.

Teleconferences should not be extended without ensuring the resources remain available, and prior coordination. This requires that the designated discussion leader keep the teleconference on schedule with the agenda. Obviously, this means that vital agenda items should be covered first in the agenda and, if agenda items run over the time allotted, the discussion leader will need to adjust the agenda by deleting or shortening later topics.

The designated discussion leader will keep notes of the teleconference and forward a summary to the Initiative Manager. The notes should contain documentation of decisions reached, action items (including a description and action item holder), and issues for resolution by IP Staff. The meeting minutes will be posted on the Geo4NIEM web portal or on the relevant Geo4NIEM Twiki page.

5.3 Progress Reporting

The OGC IP staff will provide regular (monthly) progress reports on Geo4NIEM to the sponsors. To do this, **participants must submit technical and business progress reports by the 6th of each month, as detailed in WBS Section 1.3.1 of this Annex A**. Besides reporting progress in terms of “percentage complete” on each of the deliverables expected, another purpose of the **monthly technical reports** is to capture a record of decisions and actions taken, results obtained, lessons learned, and recommendations for any changes to the work program. This becomes a valuable record of the project activity experience. The purpose of the **monthly business report** is to provide the Initiative Manager, Financial Officer, and IP Executive Director with a quick indicator of the project health, from each Participant’s perspective. These reports have proved crucial to identifying underlying issues needing to be addressed, which may not have received adequate attention in the weekly telecons and other daily communications. Initiative Architect consolidates monthly technical reports to send to the Initiative Manager by the 15th of each month. The

Initiative Manager then consolidates these into the progress reports submitted to the sponsors by the 20th of each month. The OGC IP staff and the sponsors also provide status reports about the program to the OGC Technical Committee and the OGC Planning Committee as feasible and appropriate. At those times the participants may present interface designs and other reports to the TC and PC. Demonstration scenarios and the architecture to support those demonstrations would be included in these presentations.

OGC IP staff will review action item status on a weekly basis with Team Leads and participants that are responsible for the completion of those actions. Action item status reports will be posted to the Geo4NIEM web sites each week. Email will be used to notify Team Leads and responsible parties of pending actions for a given week.

6 Interoperability Program Code of Conduct

6.1 Abstract

This section outlines the Principles of Conduct that shall govern personal and public interactions in any OGC activity. The Principles recognize the diversity of OGC process participants, emphasize the value of mutual respect, and stress the broad applicability of our work. A separate section of the Policies and Procedures details consequences that may occur if the Principles of Conduct are violated.

6.2 Introduction

The work of the OGC relies on cooperation among a broad cultural diversity of peoples, ideas, and communication styles. The Principles for Conduct guide our interactions as we work together to develop multiple, interoperable technologies for the Internet. All OGC process participants aim to abide by these Principles as we build consensus in person, at OGC meetings, in teleconferences, and in e-mail. If conflicts arise, we resolve them according to the procedures outlined in the OGC TC and IP Policies and Procedures.

6.3 Principles of Conduct

1. OGC process participants extend respect and courtesy to their colleagues at all times.

OGC process participants come from diverse origins and backgrounds and are equipped with multiple capabilities and ideals. Participants in related tasks are often employed by competing organizations. Regardless of these individual differences, participants treat their colleagues with respect as persons--especially when it is difficult to agree with them. Seeing from another's point of view is often revealing, even when it fails to be compelling.

English is the de facto language of the OGC process, but it is not the native language of many OGC process participants. Native English speakers are requested to speak clearly and a bit slowly, and to limit the use of slang in order to facilitate the comprehension of all listeners.

2. OGC process participants develop and test ideas impartially, without finding fault with the colleague proposing the idea.

We dispute ideas by using reasoned argument, rather than through intimidation or ad homonym attack. Or, said in a somewhat more consensus-like way: "Less heat and more light."

3. OGC process participants think globally, devising solutions that meet the needs of diverse technical and operational environments.

The goal of the OGC is to maintain and enhance a working, viable, scalable, global set of interfaces and protocols that provide a framework for interoperability in the geospatial domain. Many of the problems we encounter are genuinely very difficult. OGC participants use their best engineering judgment to find the best solution for the whole domain of geospatial interoperability, not just the best solution for any particular

network, technology, vendor, or user. We follow the intellectual property Principles outlined in <http://www.opengeospatial.org/legal/>.

4. Individuals who attend OGC facilitated meetings are prepared to contribute to the ongoing work of the membership and the organization.

OGC participants who attend OGC meetings read the relevant Pending Documents, RFCs, and e-mail archives beforehand, in order to familiarize themselves with the technology under discussion. This may represent a challenge for newcomers, as e-mail archives can be difficult to locate and search and it may not be easy to trace the history of longstanding Working Group, Revision Working Group, SIG, Standard Working Group, Domain Working Group or Initiative debates. With that in mind, newcomers who attend OGC meetings are encouraged to observe and absorb whatever material they can, but should not interfere with the ongoing process of the group. OGC meetings run on a very limited time schedule, and are not intended for the education of individuals. The work of the group will continue on the mailing list, and many questions would be better expressed on the list in the months that follow.

5. It is expected that many of the participants working on related tasks are from competing organizations. To preserve and sustain our productive environment in which ideas are discussed openly, and all participants' viewpoints are respected, it is imperative that participants refrain from using OGC resources (mail lists, portal, twiki, teleconferences, etc.) for commercial messages favoring any particular products, business models, or ideology.

6.4 Acknowledgements

OGC acknowledges the work done by the IETF on a code of conduct (specifically RFC 3184). These principles of conduct are modeled on their work.

Appendix: WBS Outline

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 shaded gray are either IP Team tasks, have already been completed, or are not required for the Geo4NIEM 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 Geo4NIEM; subsequent initiatives will issue appropriate task explanations).

1 Coordination

1.1 Collaborative Environment

The following subtasks are mandatory for selected organizations.

1.1.1 Routine and ad hoc telecons as assigned

Task Explanation-The proposing organization shall provide a technical representative and an alternate to participate in regularly scheduled telecons. If a participant organization has a representative that is requested or volunteers to participate in an ad hoc telecon, then that representative or a reasonable alternative shall join the ad hoc telecon if at all possible.

1.1.2 E-mail review and comment

Task Explanation-The proposing organization shall provide technical representatives to participate in specification and prototypical component development discussions via the Geo4NIEM mail list.

1.1.3 Action Item status reporting

Task Explanation-Proposing organizations' representatives shall report the status of their work in response to any action item accepted by them in whole or part. Action Items will be assigned to relevant work groups with an identified work group leader. Action item status shall be reported to the relevant work group leader.

1.2 Initiative Plan Development

1.2.1 Project Plan Development

1.2.2 Project Schedule Development

1.2.3 WBS Development

1.2.4 Concept of Operations Development

1.3 Management

The following subtasks are mandatory for all selected organizations.

1.3.1 Status Reporting

Task Explanation-Proposing organizations' business representatives shall report the status of their work as assigned to and accepted by them in their SOW following the structure of this WBS. Status reports will reflect the WBS item number and name, the "health" of the effort with green indicating optimal; yellow indicating issues have arisen that appear resolvable; and red indicating that issues have arisen that require immediate resolution or the effort will not succeed, and finally the report will describe the work done to fulfill the WBS item.

A one-time Workshop status report shall be provided that includes a list of personnel assigned to support the Geo4NIEM Initiative. The Workshop status report shall be submitted to the portal and the Geo4NIEM Initiative Manager no later than the first day of the Geo4NIEM_Workshop 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 Workshop. 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 sixth (6th) of the month or the first Monday thereafter. 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
 - Narrative to describe work accomplished during this reporting period by the participant's technical team
 - Show % Complete on assigned subtasks 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 Workshop, and notify the Initiative Manager
- **Monthly Business Report:** Word document posted on portal, then the IP Executive Director, Initiative Manager, and OGC Business Manager notified
 - Work status overview, by WBS element and name, 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

1.3.2 Initiative Accounting

Cost-share compensation to selected organizations is typically invoiced and paid in three bi-monthly installments. The dates of these installments for Geo4NIEM 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.

1.4 Communication

1.4.1 OGC Internal IP Status Briefings

1.4.2 OGC External IP Status Briefings

2 Assessments and Analysis

2.1 Organizational Capability Review

2.2 Organizational OGC Requirements Review

3 Concept Development

3.1 Sponsor Feasibility Study Review

3.2 RFT Development

3.3 RFT Response Analysis

3.4 RFT Response Review

4 Architecture Development

4.1 Operational Architecture Development

4.2 System Architecture Development

4.3 Technical Architecture Development

5 Initiative Preparation

5.1 Sponsor Planning TEMs

5.2 RFQ Development

5.3 Participant Budget Development

5.4 Contract Development

5.5 SOW/SOP Development

6 Specification Development

The Bidder's proposal shall include brief resume(s) or qualifications of technical representative(s) to lead Specification Development effort for each or applicable tasks listed below. All selected organizations shall send technical representatives to the Geo4NIEM Workshop meeting. Attendance at this meeting is mandatory for all selected organizations.

6.1 Model Development

Technical representatives of selected organizations shall develop or support the development of models that represent a service, interface, operation, message, or encoding that is being developed for the Geo4NIEM initiative. These models may be in UML or some other appropriate modeling language. All models developed in the initiative will be posted to OGC NetworkTM.

6.2 Schema Development

Technical representatives of selected organizations shall develop or support the development of schemas that specify an interface that is being developed for the Geo4NIEM initiative. These schemas will be written in XML Schema or some other appropriate language. All schemas developed in the initiative will be posted to OGC NetworkTM.

6.3 Encoding Development

Technical representatives of selected organizations shall develop or support the development of encodings that specify an interface that is being developed for the Geo4NIEM initiative. These encodings will be specified in XML Schema or some other appropriate language. As applicable, all encodings developed in the initiative will be posted to OGC NetworkTM.

6.4 Interface Development

Technical representatives of selected organizations shall develop or support the development of interfaces that specify operations, encodings or messages that are being developed for the Geo4NIEM initiative. These interfaces will be specified in XML Schema or some other appropriate language. As applicable, all interfaces developed in the initiative will be posted to OGC NetworkTM.

6.5 Specification Program Coordination

Technical representatives of selected organizations shall submit Engineering Reports (ER's) pertaining to interface developments for Geo4NIEM to the OGC Technical Committee for review. Technical representatives shall present these Reports to the relevant OGC TC groups and work with OGC members to resolve issues that the OGC members may raise with regard to the ER and the interface(s) described therein.

7 Component Development

The Bidder's proposal shall include brief resume(s) or qualifications of technical representative(s) to lead Component Development effort for each or applicable tasks listed below. All selected organizations shall send technical representatives to the Geo4NIEM Workshop meeting. Attendance at this meeting is mandatory for all selected organizations.

7.1 Prototypical Interoperable Software Development

Selected organizations shall either develop software or modify existing product software to provide the interfaces necessary under Geo4NIEM.

7.1.1 Server software development

Selected organizations shall deploy or develop server software or modify existing product server software to exercise the interfaces developed or enhanced under the Specification Development task in item 6 above for Geo4NIEM. The selected organizations will make this server software available for sponsor review and input during the course of the Geo4NIEM initiative.

7.1.2 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 Geo4NIEM. 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 all Geo4NIEM or other OGC services provided by their server.

8 Testing and Integration

8.1 Configuration Management

8.1.1 CM Plan Development

The selected organization shall provide a representative to develop a configuration management plan for interfaces and components developed during the Geo4NIEM initiative.

8.1.2 Initiative CM

The selected organization shall provide a representative to exercise the configuration management plan for interfaces and components developed during the Geo4NIEM initiative.

8.2 Infrastructure Setup

*The selected organization shall deploy as many components as possible on the same hardware and operating systems for their final deployments. **This item is mandatory for all organizations proposing to provide software and / or hardware components for Geo4NIEM.***

8.3 Technology Integration Experiments

8.3.1 Iterations 1-N

8.3.1.1 Component Interface Test

*The selected organization 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 Geo4NIEM. There will be multiple TIEs during the course of Geo4NIEM that will exercise various interfaces, operations, encodings, and messages developed during Geo4NIEM. There may also be multiple iterations of a particular TIE or set thereof. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

8.3.1.2 Test Result Analysis

*The selected organization shall provide a technical representative to report the outcome and relevant software reporting messages from TIEs in which the proposing organization participates. These TIE reports shall be submitted to the Geo4NIEM email list and within Monthly Status Report; a copy shall also be provided to the initiative architect. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

8.4 System Tests

8.4.1 Functional Test

*The selected organization shall demonstrate the functionality of all software delivered against the Use Cases in Annex B, Geo4NIEM Architecture. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

8.4.2 Interface Test

*The selected organization shall demonstrate conformance with the appropriate OGC interfaces by using the OGC CITE Web site where the appropriate test suites are available. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

9 Solution Transfer

9.1 Software Installation

*The selected organization shall provide licensed copy / copies of Geo4NIEM relevant software components for installation/integration onto the OGC Network. This may 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 install the software component(s). **This item is mandatory for all organizations proposing to develop software components for Geo4NIEM.***

9.2 Software Integration

9.3 Data Loading

*The selected organization shall provide a technical representative to load data to any server components the proposing organization may provide. This task includes data loading to OGC Network based servers. **This item is mandatory for all organizations proposing to develop server components for Geo4NIEM.***

10 Demonstration

10.1 Use Case Development

The selected organization shall provide a technical representative to develop or support the development of use cases that define and explain the utility of the components or capabilities developed during Geo4NIEM. These use cases shall be used to provide a basis for demonstration storyboards and the demonstration itself.

10.2 Storyboard Development

The selected organization shall provide a technical or business representative to develop or support the development of the demonstration storyboards that will define the structure and content of the demonstration.

10.3 Venue Access

10.4 Data Requirements Assessment

10.5 Data Acquisition and Distribution

10.6 Demonstration Preparation and Delivery

*The selected organization shall provide a technical and/or business representative to develop or support the development of the demonstration that will exercise the functionality of the capabilities developed during Geo4NIEM. The representative(s) will also support the demonstration event(s) as required. The proposing organization will maintain server and client software developed for the initiative for a period of no less than one year after the completion of the Geo4NIEM demonstration. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

11 Documentation

11.1 ER Development

*Selected organizations shall provide a technical representative to serve as editor of a relevant Engineering Report (ER). Not all organizations responding to this item will be required to provide an editor; alternatively however they shall support the editor by providing authors for sections of the ER and for reviews of the Draft ER. **The ER is the deliverable of the work items within Geo4NIEM.***

Participants shall use the appropriate Document template posted on the OGC portal when preparing reports for submittal as part of this Pilot initiative:

In some cases, the documentation required may be 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>

11.2 System Documentation Development

11.2.1 Functional Specification

11.2.1.1 Architectural Overview

*The selected organization shall provide a technical representative to develop an architectural overview of their software component(s) relevant to the Geo4NIEM architecture. **This item is mandatory for all organizations proposing to develop software components for Geo4NIEM.***

11.2.1.2 Use Cases

*The selected organization shall provide a technical representative to refine use cases to show the functionality of their software components in the context of the Geo4NIEM architecture. **This item is mandatory for all organizations proposing to provide software components for Geo4NIEM.***

11.2.1.3 UML System Models

The Selected organization shall provide a technical representative to develop valid UML documents describing information models and architectures involved in their contribution to Geo4NIEM.

11.2.1.4 System Configuration

The selected organization 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 Geo4NIEM. This item is mandatory for all organizations proposing to develop software components for Geo4NIEM to be installed at data provider or other host sites.

11.2.2 Installation Guide

The selected organization 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 Geo4NIEM to be installed at data provider or other host sites connected to the OGC Network.

11.2.3 Training Material & Users Guide

The selected organization shall provide a technical representative to develop a User's Guide and Training Materials pertaining to their software component(s) developed or modified for Geo4NIEM. The documents shall be provided to sponsors and IP Team to support their ability to demonstrate the proposing organization's contributions to the Geo4NIEM initiative. This item is mandatory for all organizations proposing to develop software components for Geo4NIEM.

11.3 Planning Study Report

12 Compliance Test Development

Technical representatives of selected organizations shall develop Draft Compliance Test documentation pertaining to an interface developed or enhanced for Geo4NIEM. Compliance test documentation shall be submitted as an Engineering Report. This task includes coordination with OGC Compliance Program. Bidder's proposals shall address this task along with Task 6, Specification Development and Task 11, Documentation in this Annex.

12.1 Summarize TIEs, demo results and data issues

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

12.2 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

12.2.1 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 and 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.

12.2.2 Data

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

12.2.3 Recommendations

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