

TITLE: OGC 3D GeoVolumes Standards Working Group Charter

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CATEGORY: SWG Charter

To: OGC members & interested parties

A new OGC Standards Working Group (SWG) is being formed. The OGC members listed below have proposed the "3D GeoVolumes SWG". The SWG proposal provided in this document meets the requirements of the OGC Technical Committee (TC) Policies and Procedures.

The SWG name, statement of purpose, scope, list of deliverables, audience, and language specified in the proposal will constitute the SWG's official charter. Technical discussions may occur no sooner than the SWG's first meeting.

This SWG will operate under the OGC IPR Policy. The eligibility requirements for becoming a participant in the SWG at the first meeting (see details below) are that:

- You must be an employee of an OGC member organization or an individual member of OGC;
- The OGC member must have signed the OGC Membership agreement;
- You must notify the SWG chair of your intent to participate to the first meeting. Members may do so by logging onto the OGC Portal and navigating to the Observer page and clicking on the link for the SWG they wish to join and;
- You must attend meetings of the SWG. The first meeting of this SWG is at the time and date fixed below. Attendance may be by teleconference.

Of course, participants also may join the SWG at any time. The OGC and the SWG welcomes all interested parties.

Non-OGC members who wish to participate may contact us about joining the OGC. In addition, the public may access some of the resources maintained for each SWG: the SWG public description, the SWG Charter, Change Requests, and public comments, which will be linked from the SWG's page.

Please feel free to forward this announcement to any other appropriate lists. The OGC is an open standards organization; we encourage your feedback.

1. Purpose of the 3D GeoVolumes Standards Working Group

The purpose of this Standards Working Group is to:

- Develop and maintain an OGC API – 3D GeoVolumes¹ core standard;
- Develop and maintain extensions of the OGC API – 3D GeoVolumes core standard; and
- Develop and maintain a 3D GeoVolumes resource model.

The formal proposed name of the new standard is "OGC API – 3D GeoVolumes - Part 1: Core." The short name "GeoVolumes SWG" or "GeoVolumes API" may also be used to refer to this effort in the charter and work products. The term "GeoVolumes" was derived from "3D geospatial volumes."

2. Business Value Proposition

In recent years several solutions and standards have emerged to access and transfer 3D geospatial content over the internet (e.g. 3D Tiles, I3S, gITF, CDB, CityGML). These solutions were developed for various technical and commercial reasons. They use different distribution mechanisms and are optimized for user requirements and bandwidth situations. As each of these co-existing solutions binds the user to an approach, it is challenging to access a variety of 3D content from different providers.

3D GeoVolumes address this challenge by providing a resource model and corresponding API to integrate various approaches into a single, open standards-based solution. The proposed API and resource model will allow efficient discovery and access of 3D content in multiple formats based on a space-centric perspective.

The proposed API will provide methods and apparatus to support:

- Executing basic commands to GET, PUT, PATCH, POST, and DELETE 3D GeoVolumes resources; and
- Interface with other resources using OGC API capabilities.

The goal of the proposed API and resource model is not to replace existing distribution methods and models for 3D content, but to enable interoperability between them.

For providers of 3D content, the API and resource model will provide simple methods to publish and offer that content as resources for use by other systems.

For developers building infrastructures, the API provides common methods to describe and leverage existing 3D content using modern APIs - saving development and deployment time and costs.

For users, applications, and enterprises, the capability to discover and access 3D content across a common API, regardless of the underlying distribution mechanism, represents a significant step forward in geospatial interoperability.

In general, the proposed API and resource model will follow a common conceptual organization of space applied by humans, which is a nested collection of spaces where every space contains either a number of sub-spaces or a set of objects. This representation of space is called the Bounding Volume, which is a closed volume containing the union of a set of geometric objects.

¹ The general naming pattern that is agreed to in OGC is "OGC API - {resource type}."

3. Scope of Work

OpenAPI frameworks have helped to make both description and sharing of API definitions more suitable for standardization than previous solutions. For this reason, OpenAPI will be used for OGC API – 3D GeoVolumes. The concept of a GeoVolumes API was demonstrated in the OGC 3D Data Container and Tiles API Pilot and OGC Interoperable Simulation and Gaming Sprint.

The 3D GeoVolumes SWG will build on those efforts to more fully develop and document a 3D GeoVolumes API candidate standard that will provide a modernized, common and consistent interface to services that aligns with the current architecture of the Web and the Spatial Data on the Web Best Practices (<https://www.w3.org/TR/sdw-bp/>).

The 3D GeoVolumes SWG will develop a 3D GeoVolumes API candidate standard which is informed by emerging OGC API best practices and prior API standards examples (e.g., OGC API – Features, OGC API - Common) to define core API functions of GET, PUT, PATCH, POST, DELETE.

- Architecture:

The OGC API – 3D GeoVolumes standard will specify an implementation specification aligned with prior work in OGC for Web APIs. The proposed standard will define API building blocks to enable servers and clients to access 3D content in multiple formats. OGC API - 3D GeoVolumes will be consistent with HTTP and HTTPS.

- Encodings:

The first version of the GeoVolumes API will support JSON and HTML as encodings of the resources in the API. No encoding will be mandatory and other encodings may be used as well. The HTTP focus is designed to support the use of multiple formats and defines rules about how servers can return the encoding that the client can best handle (“content negotiation”). The SWG will consider requirements and conformance classes for supporting GeoVolumes resources in multiple encodings in the design of the GeoVolumes API.

- Basic information model:

The GeoVolumes API standard will conform to OpenAPI models and OGC API best practices.

- Reuse:

The use of unique GeoVolumes API resources or components will be minimized and, where available, existing industry-standards or patterns that are commonly used by developers will be used instead. The most important example for this is the use of an OpenAPI definition instead of OGC-specific "Capabilities" documents and the use of OGC API - Common components to the maximum extent practicable.

- Modularization:

OGC API – 3D GeoVolumes - Part 1: Core will define a basic set of capabilities organized in multiple conformance classes building on each other. The minimal conformance class will specify a simple interface to access GeoVolumes resources. The conformance class is sufficient for interfaces to exchange and perform basic web functions with GeoVolumes resources. Additional conformance classes will define additional capabilities based on the requirements and requirements classes defined in the core to meet the needs of use cases that require such capabilities.

Identified extensions to be worked within the initial scope of the SWG charter include extensions for community specific parameters. Other extensions may be proposed and addressed in revisions to this charter. The primary goal of the GeoVolumes SWG is to develop the core of "OGC API – 3D GeoVolumes" as quickly as possible and work on extensions after that, driven by community interest. An important aspect is to ensure that implementing the standard will lead to efficient implementations, happy developers of both server and client components, and satisfied users of such components.

Before finalizing parts of the future versions of the "OGC API – 3D GeoVolumes," completion of goals should be verified:

- Working implementations of all capabilities must be available and tested; and
- Implementation feedback must be considered.

A consequence of this verification is that the period between the availability of what is considered a mature draft and the finalization of the candidate standard may be longer than in the past, depending on the availability of evidence about the suitability of the candidate standard based on implementations.

Developers should be encouraged as early as possible to implement the draft API specification and provide feedback. An aspect of this is public access to drafts from the beginning. To this end, the SWG intends to use GitHub in the development of this standard, as this is the environment many developers are familiar with and use daily.

3.1 Statement of relationship of planned work to the current OGC standards baseline

This proposed standard is intended to be a major component of the OGC API framework. The proposed standard will take advantage of Web API patterns identified in OGC API standards (e.g., OGC API – Features) and consider ongoing API efforts (e.g., OGC API – Common, OGC API – Tiles and OGC API – Features) to better align with current and emerging IT practices.

3.2 What is Out of Scope?

Standards are important for interoperability. At the same time, it is important that standards only state requirements that are important for a significantly large group of users. Proposals for new parts of OGC API – 3D GeoVolumes or change requests to existing parts must identify the user group that will benefit from the proposal and for each proposed conformance class; otherwise the proposal will be considered out-of-scope.

OGC API – 3D GeoVolumes is envisioned to be a modular, multi-part standard. Extensions and profiles not identified as in scope in the previous section will require addition of Tasks to the SWG charter prior to commencement of work. If a community has a need to develop a profile, the profile should be specified and governed by that community.

3.3 Specific Contribution of Existing Work as a Starting Point

The starting point for the work will be the OGC 20-030: OGC API - Tiles-3D (GeoVolumes)

Engineering Report, OGC 20-029: 3D Data Container Engineering Report, and OGC 20-031: 3D Data Container and Tiles API Pilot Summary Engineering Report. The work shall also be informed by the following specifications and by recommendations found in:

- OGC/W3C Spatial Data Working Group on the Web Best Practices (<https://www.w3.org/TR/sdw-bp/>);
- OGC Geospatial API White Paper [OGC 16-019r4]
- OGC API - Features - Part 1: Core standard, [OGC 17-069r3]
- Other OGC APIs and emerging API as appropriate.

Each of these documents recommends an emphasis on resource-oriented APIs in future OGC standards development including use of tools such as OpenAPI.

3.4 Is this a persistent SWG?

- Yes No

3.5 When can SWG be inactivated?

The SWG can be inactivated once the final multipart standard has been developed and change requests become minimal or not applicable for consideration. The SWG can be re-activated at any time.

4. Description of Deliverables

4.1 Initial Deliverables

The following deliverables will result from the initial work of this SWG:

- A final version of the “OGC API – 3D GeoVolumes - Part 1: Core” document for submission to the TC;
- Identification of at least three prototype implementations of the core based on the standard; and
- Zero or more additional parts as time and community interest permits.

“OGC API – 3D GeoVolumes - Part 1: Core” will cover basic capabilities to GET GeoVolume resources. Capabilities for richer interfaces or extension for unique resource considerations will be specified in additional parts.

Once this charter is approved, the targeted start date of this SWG is in July 2021. Initial GeoVolumes resource model and API specifications are anticipated by the end of calendar year 2021 with demonstrated implementations and formal approval of the core GeoVolumes API in 2022.

4.2 Additional SWG Tasks

To be completed as SWG takes on new tasks.

5. IPR Policy for this SWG

- RAND-Royalty Free. RAND for fee

6. Anticipated Participants

3D Geospatial resource providers.

Developers implementing 3D geospatial services and applications.

Users of 3D geospatial resources.

7. Domain Working Group Endorsement

The 3D Information Management (3DIM) Domain Working Group reviewed and approved the OGC 3D Data Container and Tiles API Pilot Engineering Reports and will review this SWG charter.

8. Other Informative Remarks about this SWG

a. Similar or Applicable Standards Work (OGC and Elsewhere).

The following standards work may be applicable to the work of the proposed SWG:

- 17-069, OGC API - Features
- 18-053r2, OGC 3D Tiles Community Standard 1.0
- 17-014r5, OGC Indexed 3D Scene Layer (I3S) and Scene Package Format Specification 1.0
- 17-014r7, OGC Indexed 3D Scene Layer (I3S) and Scene Package Format Specification 1.1
- 15-001r4, OGC 3D Portrayal Service 1.0

Additionally, the proposed SWG will monitor other OGC API work ongoing in various Standards and Innovation Program activities.

b. Details of the First Meeting

The first meeting of the SWG will be within four weeks of approval of the SWG.

c. Projected On-going Meeting Schedule

The work of this SWG will be carried out primarily on GitHub and via email, conference calls, with potential face-to-face meetings at OGC TC meetings as agreed to by the SWG members. The teleconference calls will be scheduled as needed and posted to the OGC portal. Voting on GeoVolumes API content will be limited to SWG members only.

d. Supporters of the Proposal (Charter Members)

The following people support this proposal and are committed to the Charter and projected meeting schedule. These members are known as SWG Founding or Charter members. The charter members agree to the Statement of Work and IPR terms as defined in this charter. The charter members have voting rights beginning the day the SWG is officially formed. Charter Members are shown on the public SWG page.

Name	Organization
Jeff Harrison	US Army Geospatial Center
Amy Youmans	US Army Geospatial Center
Thomas Myers	US Army Geospatial Center
Tom Boggess	US Army Geospatial Center
Ryan Gauthier	US Army Geospatial Center
Kevin Ring	Cesium
Michala Hill	Cognitics
Panagiotis (Peter) A. Vretanos	CubeWerx
Jerome Jacovella -St-Louis	Ecere
Anneley Hadland	Helyx
Ignacio Correas	Skymantics
Volker Coors	Steinbeis

Additionally, the 3DIM Domain Working Group has endorsed the SWG requirement. (?)

e. Convener(s)

Jeff Harrison, US Army Geospatial Center.