

Open Geospatial Consortium

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Justification for FlatGeobuf as an OGC Community Standard

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1. Introduction

This document provides a justification to the OGC Technical Committee (TC) for consideration of FlatGeobuf as a Community Standard. This justification, along with the submitted candidate Community Standard, will form the basis for TC review and vote to approve the start of a Work Item as the first step in the Community Standard process for this Standard.

The submitters agree to abide by the TC Policies and Procedures and OGC Intellectual Property Rights Policy (<http://www.opengeospatial.org/ogc/policies>) during the processing of this submission.

Once approved, the Community Standard Work Item defined by this document is valid for six (6) months.

2. Overview of proposed submission

A performant binary encoding for geographic data based on flatbuffers that can hold a collection of Simple Features including circular interpolations as defined by SQL-MM Part 3.

Goals are to be suitable for large volumes of static data, significantly faster than legacy formats without size limitations for contents or metainformation and to be suitable for streaming/random access.

Because the simple core design and efficient I/O handling it has become apparent that FlatGeobuf can work well as a "cloud native" lossless format for vector data. This is one area where FlatGeobuf can be useful for more than niche cases, because no other current format combines good performance and "cloud native" design.

The initial stable specification version of FlatGeobuf is versioned as 3.0 and was released with reference implementation and GDAL implementation early in 2020.

Besides the "cloud native" use case FlatGeobuf is suitable as a fast interoperable serialization format for efficient communication between system to system. It can also be used as a practical replacement for Shapefiles because it has the same design goal without the shortcomings (no required sidecars, no size limitations and more flexible column/value representation).

FlatGeobuf could also be used as an optional output format for WFS and OGC API and would in this case compete very favorably with GML and GeoJSON. It's known that certain proprietary GIS servers and clients uses a custom binary encoding instead of JSON to improve efficiency for feature access over HTTP, FlatGeobuf provides similar efficiency but with an open format.

3. Relationship to other OGC Standards

As mentioned FlatGeobuf adheres to the geometry types defined in SQL-MM Part 3 and the geometry type enumeration is indeed identical to WKB. The geometry encoding is, however, not WKB because a design goal of FlatGeobuf is to be "zero copy" capable which WKB is not because it is not memory aligned.

The closest OGC Standard comparable to FlatGeobuf is GML in Simple Features profile.

4. Alignment with OGC Standards Baseline

FlatGeobuf does represent Simple Features per OpenGIS Implementation Specification for Geographic information - Simple feature access - Part 1: Common architecture 1.2.1.

5. Evidence of implementation

The following implementations use the proposed Community Standard.

*Implementation name: GDAL

*Date of most recent version: 2022-01-04

*Implementation description: GDAL is an open source MIT licensed translator library for raster and vector geospatial data formats.

*Implementation URL: <https://gdal.org/>

Is implementation complete?

Yes

No

*Implementation name: QGIS

*Date of most recent version: 2022-02-18

*Implementation description: Create, edit, visualise, analyse and publish geospatial information on Windows, Mac, Linux, BSD and mobile devices. Note that the QGIS implementation uses GDAL.

*Implementation URL: <https://www.qgis.org/>

Is implementation complete?

Yes

No

*Implementation name: GeoServer

*Date of most recent version: 2022-01-24

*Implementation description: GeoServer is an open source server for sharing geospatial data.

*Implementation URL: <http://geoserver.org/>

Is implementation complete?

Yes

No

*Implementation name: PostGIS

*Date of most recent version: 2022-02-12

*Implementation description: Spatial and Geographic objects for PostgreSQL

*Implementation URL: <https://postgis.net/>

Is implementation complete?

Yes

No

*Implementation name: ldproxy

*Date of most recent version: 2022-05-04

*Implementation description: ldproxy is open source implementation to share data via OGC Web APIs; FlatGeobuf support has been added in April 2022 and will be included in version 3.3.0.

*Implementation URL: <https://github.com/interactive-instruments/ldproxy>

Is implementation complete?

Yes

No

6. Public availability

Is the proposed Community Standard currently publicly available?

Yes

No

URL: <https://github.com/flatgeobuf/flatgeobuf>

7. Supporting OGC Members

- CARTO
- Ordnance Survey
- Planet Labs
- interactive instruments

8. Intellectual Property Rights

Will the contributor retain intellectual property rights?

Yes

No

If yes, the contributor will be required to work with OGC staff to properly attribute the submitter's intellectual property rights.

If no, the contributor will assign intellectual property rights to the OGC.