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GeoServices REST API – SWG response to justification comments for No-Votes

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1 Scope

Several "No" votes have been registered during the GeoServices REST API adoption vote.

Under the current OGC Policies and Procedures, section 6.5.7, the vote has been suspended and an adjudication cycle has been initiated. The SWG has to respond within two weeks to the comments provided with the “No” vote before the vote resumes otherwise the vote would be terminated.

Justification comments and responses have to be documented and posted to pending documents so that they are available for review by all Members. Once the "No" votes have been adjudicated, then the vote is resumed and extended as necessary.

If the same members vote “No” when the vote resumes, then the OGC Architecture Board will arbitrate and make a formal recommendation to the members regarding the document. The vote is suspended while the OAB arbitrates.

This document lists the justification comments for the "No" votes and the response of the SWG to these comments.

This document includes already comments from a member who has expressed the intention to vote "No" once the voting is resumed and provided justification comments.

This is a revision of the first edition of the document to include responses to new comments that have been added after the first suspension and are not already covered by the responses to other justification comments. The new comments are items 10 and 11.

2 Justification comments and responses

This section lists the nine justification comments submitted with the "No" votes along with a (draft) response. The response is shown in *blue and italics* while comments are written in normal style.

2.1 General remarks

Before the individual comments are addressed we would like to add a few general remarks that apply in general to issues raised in the justification comments.

The submitting organizations of the GeoServices REST API are and have been supporters of OGC since its earliest years. They have actively contributed to many of today's OGC standards and have implemented many of them in their software products. They continue to be committed to the goals and mission of the OGC. The

submission has been in this spirit and with the firm conviction that the adoption of the GeoServices REST API will support both interoperability and the OGC.

Most aspects raised in the justification comments are not new and have been discussed at length before. In these cases, the response will reference the existing documentation of the discussion.

The responses in this document reflect the arguments why the GeoServices REST API should be adopted as an OGC standard as proposed. As a result, this document – together with the referenced documents – reflects the different viewpoints about the value proposition that the candidate standard offers or not to the TC. It is up to the OGC TC and PC members to decide in their adoption votes, if they consider the GeoServices REST API valuable to the wider community or not.

From the discussions since the original proposal – and the current voting – it is obvious that some OGC members see the GeoServices REST API as a risk for interoperability while others welcome the new opportunities this specification offers to the community. The arguments have been documented and every voting member should carefully read the existing material and then cast their vote.

It is also worth to point out again that the backward compatibility requirement with the existing implementations applies to the version of the candidate standard that is under vote. Once the standard has been adopted, changes will follow the OGC procedures and, for example, a future major revision could also break such backwards compatibility. However, OGC policies emphasize the importance of backwards compatibility between revisions of a standard and the careful considerations that are necessary in this process. The SWG has discussed these issues in depth. As a result a section "Versioning Rules" has been added in OGC document 12-045r2 (Part 1). These rules are in line with the existing OGC versioning policies, but are more specific in order to provide guidance for future implementers.

Originally the Esri GeoServices REST specification was conceived at Esri based on a successful implementation using the ArcGIS server platform. The specification was later made an open specification and then taken to the Open Geospatial Consortium. As part of the SWG deliberations, the specification has been reviewed and changes have been made to remove any implementation specific artifacts.

The OGC TC Policies and Procedures emphasize the importance of implementations supporting the submission of candidate standards ("Any OGC Technical Committee Voting Member may make an unsolicited submission of [a] candidate standard using the RFC process given that the submission [...] already exists in a viable implementation and is supported by evidence of a continued commitment to commercialize and/or support the implementation", "RFC submissions must contain a commitment by at least one of the members of a submission team to make the implementation available on commercially reasonable terms").

A number of implementations exist in addition to Esri's implementation and are proof of the implementability of the specification.

They have been implemented for a range of use cases that involve non-Esri implementations.

Non-Esri client connects to non-Esri server: An example for this case is the ITT Exelis implementation where ENVI contains both client and server components supporting the Geoprocessing Service.

Non-Esri client connects to Esri server: Examples include the Map Service support in OpenLayers[1] or the capability of ENVI from ITT Exelis to consume Image Services. Of course, the clients can also connect to non-Esri servers, but currently many publicly accessible servers are ArcGIS-based including the base maps provided by ArcGIS Online.

Esri client connects to non-Esri server: Examples include support for the Feature Service in XtraServer from interactive instruments[2] or in the GeoServices SenseBox from 52°North[3] providing easy access to measurements from the "open-hardware" microcontroller platform, Arduino[4]. These implementations allows access to feature data using, for example, all clients from Esri. The interoperability between Esri clients and the interactive instruments server was also demonstrated as part of OGC's OWS-9 testbed.

Processing GeoServices JSON: Starting with OGR 1.8.0, the GDAL GeoJSON driver can read the GeoServices JSON returned by GeoServices REST API Feature Services[5]. The GDAL library is an important component of many geospatial systems. Given that it is Open Source, it now provides a bridge for a lot of developers to easily leverage GeoServices capabilities within their stack (by using GDAL to do the heavy lifting).

Other implementations are:

52°North has implemented an ArcGIS Server SOS Extension: This service is fully compliant with the OGC Sensor Observation Service (SOS) 2.0 standard. In addition, the service provides a new extension to the GeoServices REST API for sensor resources[6].

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[1] Examples of using OpenLayers with ArcGIS Server REST API (prior to the release of the GeoServices REST specification) are http://www.slideshare.net/cageyjames/using-open-layers-with-arc-gis-server-rest-api-dev-summit or http://openlayers.org/dev/examples/arcgis93rest.html.

[2] http://www.interactive-instruments.de/en/xtraserver/

[3] https://svn.52north.org/svn/swe/incubation/sensebox/GeoServicesSB/tags/21122012beta/

[4] http://arduino.cc/

[5] http://www.gdal.org/ogr/drv_geojson.html

[6] http://52north.org/communities/sensorweb/sosSOE/index.html (implementation), http://52north.org/communities/sensorweb/docs/specification.htm (specification of the extension)

Arc2Earth is a company that started leveraging the GeoServices REST specification right from the time it went public and use this technology in their products[7].

Voyager GIS is a Catalog solution that can index various type of geospatial content across the enterprise and the web. It extensively uses the GeoServices REST API to connect to and parse web service content that it then catalogs.

2.2 Responses to justification comments

After these general remarks, we look at the submitted justification comments one-by-one:

1. We believe that this unnecessarily replicates the functionality of existing specifications. It is a negative move for interoperability. It is not good fot the OGC. I urge other members also to vote NO.

The functional overlap and harmonization with the current OGC baseline has been discussed in 2011 both in the OAB and in a joint PC/BoD meeting and deemed not a reason to reject the proposal. The issue has been raised in public comments again, see OGC document 12-164, and the response is included in section 2.2 of the same document. This applies to this comment, too.

Also note that the future work section explicitly lists harmonization with future versions of other OGC standards, in particular the OGC Web Service standards, as a potential work item for future revisions.

2. It will set back interoperability by 10 years or more. The standard covers areas that existing OGC standards were developed to serve including imaging, feature serving, cataloging, map serving etc. There is simply no need for the standard.

See comment 1.

3. Having a REST API at the OGC is a good thin[g] and we strongly encourage this initiative. Having a JSON representation of data is also a good thing from an implementation point of view in a sense that it simplifies client/server development.
   However - as stated from the first presentation of the GeoServices REST API - a JSON representation of geographical object is already there and it's called GeoJSON. Yes GeoJSON is not perfect and yes it is not an OGC specification. But as it is widely used, the GeoServices REST API should take it into account instead of redefining the wheel and makes something different. We definitively want to

[7] For example, see http://www.arc2earth.com/2011/03/arc2cloud-uploading-data/. A sample Feature Service endpoint is: http://sync.arc2earth.com/6442491/ArcGIS/rest/services/tfs/2447544/FeatureServer/0.

avoid a [dichotomy] between OGC members and non-members which will preferably follow open initiatives like GeoJSON.

The proposal to use GeoJSON instead of the GeoServices JSON for encoding features and geometry has been raised in public comments, see OGC document 12-164, and the response is included in section 2.3 of the same document. This applies to this comment, too.

It is a fact that both GeoJSON and GeoServices JSON have existed for several years, are broadly used and can be expected to be supported by clients in the future. Therefore, adding support for GeoJSON in the near future has been recorded as one of the key future work items. Completing such an extension has not been possible within scope of the current revision, but the SWG would welcome and support such contribution.

4. It is our opinion that this proposed standard is in conflict with existing OGC standards. A better approach would be to incorporate upgrades to existing OGC standards to include REST / JSON.

See comment 1.

5. There is far too much overlap with existing OGC standards, with this document offering more or less nothing new over and above the OGC baseline. This will lead to confusion both inside and outside OGC about which standard to use when, and about the future of those competing standards.

See comment 1.

6. De jure adoption of any standard that is so tightly bound to the data structures and/or data formats and/or terminology and/or functionality of a single piece of existing software is inherently, unavoidably unfair on all other potential implementations and will stifle innovation.

The shape file as a data format is greatly valued by the GIS community. The geodatabase data format from Esri is also of great interest to the GIS community. In both cases, there were requests to share the data structure in an open format. Esri opened up the shape file format and with the geodatabase, provided an open API to access spatial data. The GeoServices REST API leverages these popular open data structures (which are themselves built on OGC Simple Features). The JSON representations are but simple web-friendly representations of these data structures. Due to the support for shape files or geodatabases in many non-Esri products these products already support these data structures.

It is true that the specification comes out of an existing implementation. But that should in many ways be treated as a positive sign.

It is unclear why adoption of the GeoServices REST API would stifle innovation as expressed in the comment. In fact, the proposal of the GeoServices REST API to OGC already triggered the discussion of other RESTful service interfaces for spatial data and processes (e.g., the WFS REST binding and in the RESTful services policy SWG). In addition, the GeoServices REST API provides a framework for extensions and is expected to facilitate innovation.

7. Geoservices REST (GR) is not a community driven standard but in practice is governed by a single company.

   The decision was taken to keep the GR backwards compatible with the existing ESRI Geoservices REST specification because of its widespread use in the ESRI community. As such the current specification is defined by a single company. The OGC draft specification states as well that extensions of the standard must demonstrate actual use of the extensions. ESRI, being a company that invests in R&D to evolve its own products of which GR is an important part, has made and will make extensions to GR that will be (and have to be) in use by the time they reach the OGC SWG. The backwards compatibility reasoning for the initial specification will equally apply to extensions and evolutions, making this a standard that in practice is governed by a single company.

   For instance, ArcGIS Server REST API 10.0 SP1 and SP2 already contain extensions of the Geoservices REST specification (e.g. returnCountOnly parameter in Map&Feature requests). I presume they would have to be adopted *as is* in a future version of the standard.

This is not the case. Once the standard has been adopted by OGC, revisions will follow the OGC revision process. There is no "automatic" inclusion of any extension, from Esri or someone else, into a future revision. It will be the decision of the OGC membership.

This is not different from existing OGC standards. Some extensions will be submitted as Change Requests to the OGC, many will not. Some of the submitted Change Requests will be included in a revision, because they are considered useful and general enough, some will be rejected as too specific for standardization or as not useful. There is no reason why this should be different in the case of the GeoServices REST API.

Yes, Esri will continue to develop extensions and submit change requests, and maybe more than others, but again this is not essentially different from the situation with other OGC standards.

   While the specification may well have its technical merits, as is proven by the use in the ESRI community, it is Luciad's position that publication of the specification by ESRI is sufficient for other parties to use or implement it. We might even consider doing so for some parts and some customers. *However, it should not be under an OGC flag without it being a real community-driven standard.*

There is merit in adopting the specification as an OGC standard.

It supports the mission of the OGC, if the key spatial implementation standards are maintained as standards by the OGC. The OGC provides existing and proven processes for community involvement, revisions of standards as well as innovation and testing. NetCDF or KML are other examples where specifications that were originally been developed outside of the OGC have been adopted as OGC standards are maintained under the policies and procedures of the OGC since then. GeoSciML is another candidate that is currently in the process.

Bringing the GeoServices REST API into OGC provides an opportunity for the community – not just Esri – to extend this framework to meet future unmet needs, and to adopt such extensions in future revisions.

Doing so would put many members to a disadvantage with respect to ESRI. I, for sure, would have ideas on how to leverage this if I were a marketeer that wanted to do so ("OGC standardizes on ESRI technology", "Be safe and buy from the source of the OGC Geoservices standard", "Even OGC says the Geoservices are much simpler and deliver higher performance than WxS" – note that I do not agree with this statement, but it is stated in OGC 12-062r2).

The GeoServices REST API brings to the table a pragmatic RESTful approach to GIS services. Vendors can build their systems to serve or consume these services. This allows many organizations to buy software from a variety of vendors to tie into solutions built on Esri or other software. It also allows vendors to leverage a standard that has thought through the hard design problems. Eventually market dynamics (pricing, performance and other factors) will dictate, if a certain implementation – or a certain implementation standard – generates more interest and has greater impact. It is true that the specification comes out of an existing implementation. But that should in many ways be treated as a positive sign. One of the aims of the SWG process was to make sure that the specification as it is released now, does not have artifacts that unduly help one vendor/implementation.

8. The overlap of Geoservices REST and other existing OGC WxS standards will cause a tremendous amount of confusion with implementers, users and most importantly organizations (e.g., government) that mandate specific standards in their RFPs.

   This is so for the current Geoservices REST specification and it will become worse when Geoservices and WxS evolve. The argumentation in the positioning document is that GR is simpler and addresses a need for REST & JSON. WxS is more advanced yet claimed to be harder to implement. Possible evolution of GR in the draft standard document, however, details many extensions to make it more powerful (XML-based response, additional geometries, …) while initiatives for WxS also consider simplified/alternative profiles (GML SF, WMTS with REST, …).

Extensions to the standards will increase overlap up to the point that the original argumentation (simpler, REST, …) does not apply anymore. This is a situation to be avoided. It will be very hard for organizations to predict which standard is most appropriate for their needs. If they mandate both, suppliers will need to cope with the limitations of both GR and WxS standards.

On a side note, the relationship with the OGC baseline document reads to me almost as a failure of the existing OGC standards (complex, only for advanced use cases, slow). I find that this does not do justice to the hard work of people and organizations defining and implementing these standards. I'd recommend significant rephrasing of the document.

Without a fundamental positioning from OGC for both sets of specifications *and their evolution*, the confusion can never be resolved. This confusion will reduce interoperability.

Possible solutions:

- Deprecate existing WxS standards in favor of a Geoservices REST standard evolving to cover all of WxS. NB. Luciad is not in favor of this
- Abandon backwards compatibility of Geoservices REST, split them, and make them part of the respective WxS specifications after harmonization.
- Leave the Geoservices REST as an open ESRI specification.
- Revise positioning, although I do not see a clear way to solve this.

This comment implies that the WxS standards are a homogenous set, which is not the case. There is, for example, overlap in the capabilities of WFS, WCS and SOS; in some cases each of these may be used to serve the same data. Likewise maps may be served by both WMS or WMTS. Or data may be served in different encodings (GML, Simple Feature WKT or WKB, GeoSPARQL, KML, GeoPackage, etc.). Or via different service bindings supported by the WxS standards (KVP, POST, SOAP, REST, etc). An so on. I.e., there has and will always be different options to develop standards-based solutions – with or without the GeoServices REST API – and organizations will have to select the options that best meets their requirements. As such there is no fundamental change of the situation.

The GeoServices REST API is a comprehensive specification and indeed the overlap in OGC's standards baseline would increase with the GeoServices REST API. At the same time, the new standard would add new options that may suit some use cases better than the current standards.

If approved as an OGC standard, an outreach plan that addresses such issues is needed and OGC staff is aware of this. The SWG is looking forward to support staff in this work. In the discussions the SWG has identified two aspects that should be addressed as part of this: branding and positioning in the standards baseline. With respect to branding the SWG feels that an official acronym for the full name "GeoServices REST API" may be helpful, like in the case of most other OGC standards. With respect to positioning,

document 12-062r2 provides input, but it is not meant to reflect an OGC position. It is not a standard, it is supporting material that the SWG created on request by the OAB and should provide material that can be considered when the outreach plan is developed.

9. Luciad seconds comments by other members:
   - Use of GeoJSON should be mandated
   - REST profiles for other specifications should be preferred over an overlapping yet very different standard.

See comments 1 and 3.

10. Sharing the comment of CNES I would also add the need of addressing imagery compressed formats (sid, jp2..any) and the need of handling data with classification (at level of metadata and or the data itself). And maybe redirect the several parts to the specifics SWG?

Adding support for additional formats is fully inline with the identified future work items and the openness towards extensions as documented in the section on versioning rules ("add support for new formats").

Earlier comments proposed additional resource representations and these have been identified explicitly in the future work section (for example, GeoJSON). So far, the need for additional imagery formats has not been raised in comments within the SWG or in public comments. We propose to add a statement in the future work section of the Image Service "Add support for MrSID, JPEG2000 and potentially other imagery formats".

The request for supporting "data with classification (at level of metadata and or the data itself)" is an extension to the current capability and would be a good candidate for future work, if there is sufficient interest. Therefore, we propose to add another item in the future work section of the Image Service: "Add support for data with classification".

Regarding redirecting parts to SWGs. In the current process, the GeoServices REST SWG is responsible for the candidate standard. After adoption it will be up to the OGC TC to assign Change Requests to specific SWGs. This may be existing SWGs (which likely would required an updated charter) or one or more new SWGs.

11. The name of the specification is confusing with respect to other standards. Other OGC standards provide 'geo-services' as well. A clear acronym must be mandated in the specification document before it is adopted. My proposal would be 'SGS' for 'Simple GeoServices'. 'REST' should not be part of the acronym, as other bindings may be added in potential future versions.

While this comment has originally been covered already in the last paragraph of the response to comment 8 above, the SWG has rediscussed the topic and agrees to consider to change the name of the standard and to define an acronym to address the concerns raised in the comment and subsequent discussions. The SWG has initiated a process for this. A request for proposals will be sent to the SWG, the existing proposals will automatically be included in the list of candidates. The SWG will then discuss and vote on the submitted proposals and select a name and acronym.

As this is not a technical issue, it should not interfere with restarting the vote. The SWG will inform the TC as soon as possible about the selected name and acronym. This information will be provided during the voting period in due time and voting members will be able to consider this in their vote.