STAC API Validator

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INTRODUCTION

The STAC API Validator is the official validation suite for the STAC API family of specifications.

TWO

DOCUMENTATION

See the stable or latest documentation pages.

THREE

INSTALLATION

STAC API Validator requires Python 3.10.

You can install STAC API Validator via pip from PyPI:

pip install stac-api-validator

and then run it:

```
stac-api-validator \
    --root-url https://planetarycomputer.microsoft.com/api/stac/v1/ \
    --conformance core \
    --conformance features \
    --conformance item-search \
    --collection sentinel-2-l2a \
    --geometry '{"type": "Polygon", "coordinates": [[[100.0, 0.0], [101.0, 0.0], [101.0, ...]
    -1.0], [100.0, 1.0], [100.0, 0.0]]]}'
```

FOUR

CONTRIBUTING

Contributions are very welcome. To learn more, see the *Contributor Guide*.

FIVE

USAGE

Please see the *Command-line Reference* for details.

The conformance class validations to run are selected with the --conformance parameters. This parameter can be used more than once to specify multiple conformance classes to validate. The STAC API - Core conformance class will always be validated, even if not specified.

If item-search, collections, and/or features are specified, the --collection and --geometry parameters must also be specified. The --collection parameter specifies the name of a collection to use for some of the validations. The --geometry should specify an AOI over which there are between 100 and 20,000 results for the collection (more results means longer time to run).

FEATURES

Work in Progress – this currently only validates a subset of behavior

This validation suite focuses on validating STAC API interactions. Tools such as pystac and stac4s do a good job of validating STAC objects (Catalog, Collection, Item). This suite focuses on the STAC API behavior validation.

The three key concepts within a STAC API are:

- 1. Conformance classes advertising the capabilities of the API
- 2. Link relations between resources within the web API (hypermedia)
- 3. Parameters that filter search results

The conformance classes, as defined in the conformsTo field of the Landing Page (root, /), advertise to clients which capabilities are available in the API. Without this field, a client would not even be able to tell that a root URI was a STAC API.

The link relations define how to navigate a STAC catalog through parent-child links and find resources such as the OpenAPI specification. While many OGC API and STAC API endpoint have a fixed value (e.g., /collections), it is preferable for clients discover the paths via hypermedia.

The parameters that filter results apply to the Items resource and Item Search endpoints.

The current validity status of several popular STAC API implementations can be found here.

SEVEN

COMMAND-LINE REFERENCE

Usage:

Usage: stac-api-validator [OPTIONS]				
STAC API Validator.				
Options:				
version	Show the version and exit.			
log-level TEXT	Logging level, one of DEBUG, INFO, WARN, ERROR, CRITICAL			
root-url TEXT	STAC API Root / Landing Page URL [required]			
collection TEXT	The name of the collection to use for item- search, collections, and features tests.			
geometry TEXT	The GeoJSON geometry to use for intersection tests.			
<pre>conformance [core browseable item-search features collections children filter]</pre>				
	The conformance classes to validate. [required]			
auth-bearer-token TEXT	Authorization Bearer token value to append to all requests.			
auth-query-parameter TEXT	Query pararmeter key and value to pass for authorization, e.g., 'key=xyz'.			
help	Show this message and exit.			

Conformance classes item-search, features, and collections require the **--collection** parameter with the id of a collection to run some tests on.

Conformance class item-search requires --geometry with a GeoJSON geometry that returns some items for the specified collection.

Example:

stac-api-validator \			
<pre>root-url https://planetarycomputer.microsoft.com/api/stac/v1/ \</pre>			
conformance core \			
conformance item-search \setminus			
conformance features \setminus			
collection sentinel-2-l2a \setminus			
geometry '{"type": "Polygon", "coordinates": [[[100.0, 0.0], [101.0, 0.0], [101.0,			
$\rightarrow 1.0], [100.0, 1.0], [100.0, 0.0]]] \}'$			

Example output:

```
Validating https://cmr.earthdata.nasa.gov/stac/LARC_ASDC ...
STAC API - Core conformance class found.
STAC API - Item Search conformance class found.
warnings: none
errors:
- service-desc (https://api.stacspec.org/v1.0.0-beta.1/openapi.yaml): should have_
- content-type header 'application/vnd.oai.openapi+json;version=3.0'', actually 'text/
- yaml'
- service-desc (https://api.stacspec.org/v1.0.0-beta.1/openapi.yaml): should return JSON,
- instead got non-JSON text
- GET Search with bbox=100.0, 0.0, 105.0, 1.0 returned status code 400
- POST Search with bbox:[100.0, 0.0, 105.0, 1.0] returned status code 400
- POST Search with bbox=100.0, 0.0, 0.0, 105.0, 1.0, 1.0] returned status code 400
- POST Search with bbox:[100.0, 0.0, 0.0, 105.0, 1.0, 1.0] returned status code 400
```

Example with authorization using parameters:

EIGHT

VALIDATING OGC API FEATURES - PART 1 COMPLIANCE

A STAC API that conforms to the "STAC API - Features" conformance class will also be a valid implementation of OGC API Features - Part 1. In general, this validator focuses on those aspects of API behavior that are different between STAC and OGC. It is recommended that implementers also use the OGC API Features - Part 1 validation test suite to validate conformance.

Full instructions are available at the link above, but the simplest way to run this is with:

docker run -p 8081:8080 ogccite/ets-ogcapi-features10

Then, open http://localhost:8081/teamengine/ and login with the username and password ogctest, Create a new session, with Organization OGC, Specification OGC API - Features, Start a new test session, input he root URL for the service, and Start.

NINE

COMMON MISTAKES

- incorrect conformsTo in the Landing Page. This was added between STAC API 0.9 and 1.0. It should be the same as the value in the conformsTo in the OAFeat /conformance endpoint.
- OGC API Features uses data relation link relation at the root to point to the Collections endpoint (/ collections), not collections relation
- media type for link relation service-desc and endpoint is application/vnd.oai.openapi+json; version=3.0 (not application/json) and link relation search and endpoint is application/geo+json (not application/json)
- Use of OCG API "req" urls instead of "conf" urls, e.g. http://www.opengis.net/spec/ ogcapi-features-1/1.0/conf/core should be used, not http://www.opengis.net/spec/ ogcapi-features-1/1.0/req/core

TEN

LICENSE

Distributed under the terms of the Apache 2.0 license, STAC API Validator is free and open source software.

ELEVEN

ISSUES

If you encounter any problems, please file an issue along with a detailed description.

TWELVE

CREDITS

This project was generated from @cjolowicz's Hypermodern Python Cookiecutter template.

12.1 Usage

12.1.1 stac-api-validator

STAC API Validator.

stac-api-validator [OPTIONS]

Options

--version

Show the version and exit.

```
--log-level <log_level>
```

Logging level, one of DEBUG, INFO, WARN, ERROR, CRITICAL

```
--root-url <root_url>
```

Required STAC API Root / Landing Page URL

--collection <collection>

The name of the collection to use for item-search, collections, and features tests.

--geometry <geometry>

The GeoJSON geometry to use for intersection tests.

```
--conformance <conformance_classes>
```

Required The conformance classes to validate.

Options

core | browseable | item-search | features | collections | children | filter | item-search#sort | itemsearch#fields | item-search#query | features#sort | features#fields | features#query | transaction

```
--auth-bearer-token <auth_bearer_token>
```

Authorization Bearer token value to append to all requests.

```
--auth-query-parameter <auth_query_parameter>
```

Query parameter key and value to pass for authorization, e.g., 'key=xyz'.

```
--fields-nested-property <fields_nested_property>
     Fields Extension: name of a field in Item Properties, e.g. 'properties.eo:cloud_cover'
--validate-pagination, --no-validate-pagination
     Validate pagination behavior (can take a long time to run)
--query-comparison-field <query_comparison_field>
     Query Extension: name of field to use for comparison operators tests (eq, neq, lt, lte, gt, gte)
--query-eq-value <query_eq_value>
     Query Extension: value of field to use for eq
--query_neq_value <query_neq_value>
     Query Extension: value of field to use for neq
--query_lt_value <query_lt_value>
     Query Extension: value of field to use for lt
--query-lte-value <query_lte_value>
     Query Extension: value of field to use for Ite
--query_gt_value <query_gt_value>
     Query Extension: value of field to use for gt
--query_gte_value <query_gte_value>
     Query Extension: value of field to use for gte
--query-substring-field <query_substring_field>
     Query Extension: name of field to use for substring operators tests (startsWith, endsWith, contains)
--query-starts-with-value <query_starts_with_value>
     Query Extension: value of field to use for startsWith
--query-ends-with-value <query_ends_with_value>
     Query Extension: value of field to use for endsWith
--query-contains-value <query_contains_value>
     Query Extension: value of field to use for contains
--query-in-field <query_in_field>
     Query Extension: name of field to use for 'in' operator tests
--query_in_values <query_in_values>
     Query Extension: comma-separated values of field to use for 'in' operator tests
--transaction-collection <transaction_collection>
```

The name of the collection to use for Transaction Extension tests.

12.2 Reference

12.2.1 stac_api_validator

STAC API Validator.

12.3 Contributor Guide

Thank you for your interest in improving this project. This project is open-source under the Apache 2.0 license and welcomes contributions in the form of bug reports, feature requests, and pull requests.

Here is a list of important resources for contributors:

- Source Code
- Documentation
- Issue Tracker
- Code of Conduct

12.3.1 How to report a bug

Report bugs on the Issue Tracker.

When filing an issue, make sure to answer these questions:

- Which operating system and Python version are you using?
- Which version of this project are you using?
- · What did you do?
- What did you expect to see?
- What did you see instead?

The best way to get your bug fixed is to provide a test case, and/or steps to reproduce the issue.

12.3.2 How to request a feature

Request features on the Issue Tracker.

12.3.3 How to set up your development environment

You need Python 3.10 and the following tools:

- Poetry version 1.3.x
- Nox
- nox-poetry

Install the package with development requirements:

\$ poetry install

You can now run an interactive Python session, or the command-line interface:

```
$ poetry run python
$ poetry run stac-api-validator
```

Note: if poetry update or poetry install hang, try running poetry cache clear --all pypi to fix the issue.

12.3.4 How to test the project

Run the full test suite:

\$ nox

List the available Nox sessions:

```
$ nox --list-sessions
```

You can also run a specific Nox session. For example, invoke the unit test suite like this:

```
$ nox --session=tests
```

Unit tests are located in the tests directory, and are written using the pytest testing framework.

12.3.5 How to submit changes

Open a pull request to submit changes to this project.

Your pull request needs to meet the following guidelines for acceptance:

- The Nox test suite must pass without errors and warnings.
- Include unit tests. This project maintains 100% code coverage.
- If your changes add functionality, update the documentation accordingly.

Feel free to submit early, though—we can always iterate on this.

To run linting and code formatting checks before committing your change, you can install pre-commit as a Git hook by running the following command:

\$ nox --session=pre-commit -- install

It is recommended to open an issue before starting work on anything. This will allow a chance to talk it over with the owners and validate your approach.

12.4 Contributor Covenant Code of Conduct

12.4.1 Our Pledge

We as members, contributors, and leaders pledge to make participation in our community a harassment-free experience for everyone, regardless of age, body size, visible or invisible disability, ethnicity, sex characteristics, gender identity and expression, level of experience, education, socio-economic status, nationality, personal appearance, race, caste, color, religion, or sexual identity and orientation.

We pledge to act and interact in ways that contribute to an open, welcoming, diverse, inclusive, and healthy community.

12.4.2 Our Standards

Examples of behavior that contributes to a positive environment for our community include:

- Demonstrating empathy and kindness toward other people
- Being respectful of differing opinions, viewpoints, and experiences
- · Giving and gracefully accepting constructive feedback
- · Accepting responsibility and apologizing to those affected by our mistakes, and learning from the experience
- Focusing on what is best not just for us as individuals, but for the overall community

Examples of unacceptable behavior include:

- The use of sexualized language or imagery, and sexual attention or advances of any kind
- Trolling, insulting or derogatory comments, and personal or political attacks
- · Public or private harassment
- Publishing others' private information, such as a physical or email address, without their explicit permission
- · Other conduct which could reasonably be considered inappropriate in a professional setting

12.4.3 Enforcement Responsibilities

Community leaders are responsible for clarifying and enforcing our standards of acceptable behavior and will take appropriate and fair corrective action in response to any behavior that they deem inappropriate, threatening, offensive, or harmful.

Community leaders have the right and responsibility to remove, edit, or reject comments, commits, code, wiki edits, issues, and other contributions that are not aligned to this Code of Conduct, and will communicate reasons for moderation decisions when appropriate.

12.4.4 Scope

This Code of Conduct applies within all community spaces, and also applies when an individual is officially representing the community in public spaces. Examples of representing our community include using an official e-mail address, posting via an official social media account, or acting as an appointed representative at an online or offline event.

12.4.5 Enforcement

Instances of abusive, harassing, or otherwise unacceptable behavior may be reported to the community leaders responsible for enforcement at phil@philvarner.com. All complaints will be reviewed and investigated promptly and fairly.

All community leaders are obligated to respect the privacy and security of the reporter of any incident.

12.4.6 Enforcement Guidelines

Community leaders will follow these Community Impact Guidelines in determining the consequences for any action they deem in violation of this Code of Conduct:

1. Correction

Community Impact: Use of inappropriate language or other behavior deemed unprofessional or unwelcome in the community.

Consequence: A private, written warning from community leaders, providing clarity around the nature of the violation and an explanation of why the behavior was inappropriate. A public apology may be requested.

2. Warning

Community Impact: A violation through a single incident or series of actions.

Consequence: A warning with consequences for continued behavior. No interaction with the people involved, including unsolicited interaction with those enforcing the Code of Conduct, for a specified period of time. This includes avoiding interactions in community spaces as well as external channels like social media. Violating these terms may lead to a temporary or permanent ban.

3. Temporary Ban

Community Impact: A serious violation of community standards, including sustained inappropriate behavior.

Consequence: A temporary ban from any sort of interaction or public communication with the community for a specified period of time. No public or private interaction with the people involved, including unsolicited interaction with those enforcing the Code of Conduct, is allowed during this period. Violating these terms may lead to a permanent ban.

4. Permanent Ban

Community Impact: Demonstrating a pattern of violation of community standards, including sustained inappropriate behavior, harassment of an individual, or aggression toward or disparagement of classes of individuals.

Consequence: A permanent ban from any sort of public interaction within the community.

12.4.7 Attribution

This Code of Conduct is adapted from the Contributor Covenant, version 2.1, available at https://www. contributor-covenant.org/version/2/1/code_of_conduct.html.

Community Impact Guidelines were inspired by Mozilla's code of conduct enforcement ladder.

For answers to common questions about this code of conduct, see the FAQ at https://www.contributor-covenant.org/faq. Translations are available at https://www.contributor-covenant.org/translations.

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