

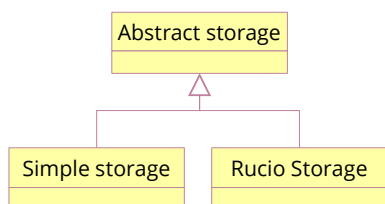


SRC | Net

SKAO Regional Centre Network

Using OpenAPI for IVOA standards

Lessons learned



Dave Morris
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IVOA interop meeting
Valletta, Malta
November 2024

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GWS working group

Developing a new standard for remote execution of software.

Moving the code to the data.



*International
Virtual
Observatory
Alliance*

IVOA Execution Broker

Version 1.0

IVOA Working Draft 2024-11-15

Working Group
GWS

This version

<https://www.ivoa.net/documents/ExecutionBroker/20241115>

Latest version

<https://www.ivoa.net/documents/ExecutionBroker>

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New standard, new document structure.

The Execution Broker service is based on the following IVOA standards :

- *The IVOA REST service framework*
- *The IVOA structured error messages*
- *The IVOA HTTP protocol profile*
- *The IVOA JSON encoding profile*
- *The IVOA YAML encoding profile*

Unless otherwise stated, the Execution Broker service follows the profiles defined in these standards.

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Way back in history ...

IVOA Web Service Basic Profile

<https://www.ivoa.net/documents/WSBasicProfile/>

This document describes rules to take into account when implementing SOAP-based web services.

It can be read as a "Guideline to VO Web Service Interoperability" or a "How to provide interoperable VO web services".



IVOA Web Services Basic Profile Version 1.0

IVOA WG Recommendation 2010 December 16

This version:

<http://www.ivoa.net/Documents/WSBasicProfile/20101216>

Latest version:

<http://www.ivoa.net/Documents/WSBasicProfile/>

Previous versions:

PR: <http://www.ivoa.net/Documents/WSBasicProfile/20102010>

PR: <http://www.ivoa.net/Documents/WSBasicProfile/20100226>

WD: <http://www.ivoa.net/Documents/WSBasicProfile/20080916>

Working Group:

<http://www.ivoa.net/twiki/bin/view/IVOA/IvoaGridAndWebServices>

Author(s):

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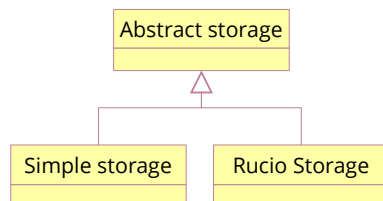
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New standard, new document structure.

“This document explains the reasoning behind the design and uses examples to describe the service behavior.”

“The technical details of the data model and web-service API are defined in the OpenAPI specification published alongside this document.”



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This version
[https://www.ivoa.net/do](https://www.ivoa.net/documents/20240701/1.0/)

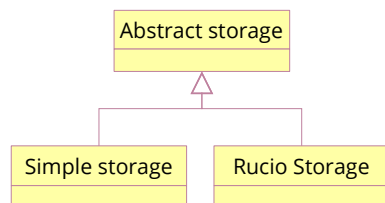
Latest version
[https://www.ivoa.net/do](https://www.ivoa.net/documents/20240701/1.0/)



```
openapi: 3.1.0
info:
  title: IVOA Execution Broker
  version: "1.0"
  description: >
    IVOA Execution Broker web service
  license:
    Name: >
      Creative Commons Attribution
      Share Alike 4.0 International
    identifier: CC-BY-SA-4.0
paths:
  /offersets:
    post:
      requestBody:
        content:
          application/json:
            schema:
              $ref: 'OfferSetRequest'
          application/yaml:
            schema:
              $ref: 'OfferSetRequest'
            required: true
```

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Using OpenAPI to specify the data model and web service API.



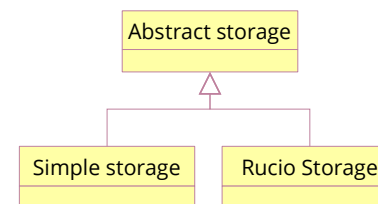
What worked

What didn't work

Would I use it again

What worked

Using OpenAPI to describe the data model and service API

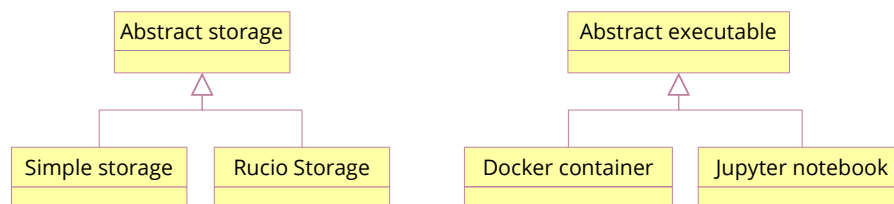


- Shallow learning curve
- Good documentation
- Clear and easy syntax
- Good feature coverage

What worked

Generating Java service code from the OpenAPI specification

Including support for polymorphic types in the message content.



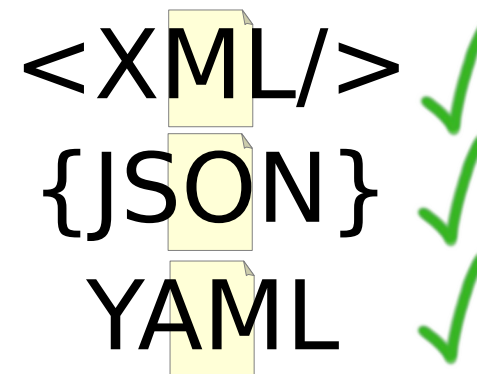
What worked

Generating Java service code from the OpenAPI specification

Including support for HTTP content type negotiation.



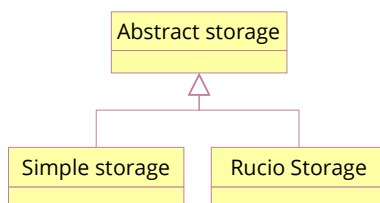
Content-type:
Accept:



What didn't work

Generating Python service code from the OpenAPI specification

Issues with both polymorphic types and content negotiation.



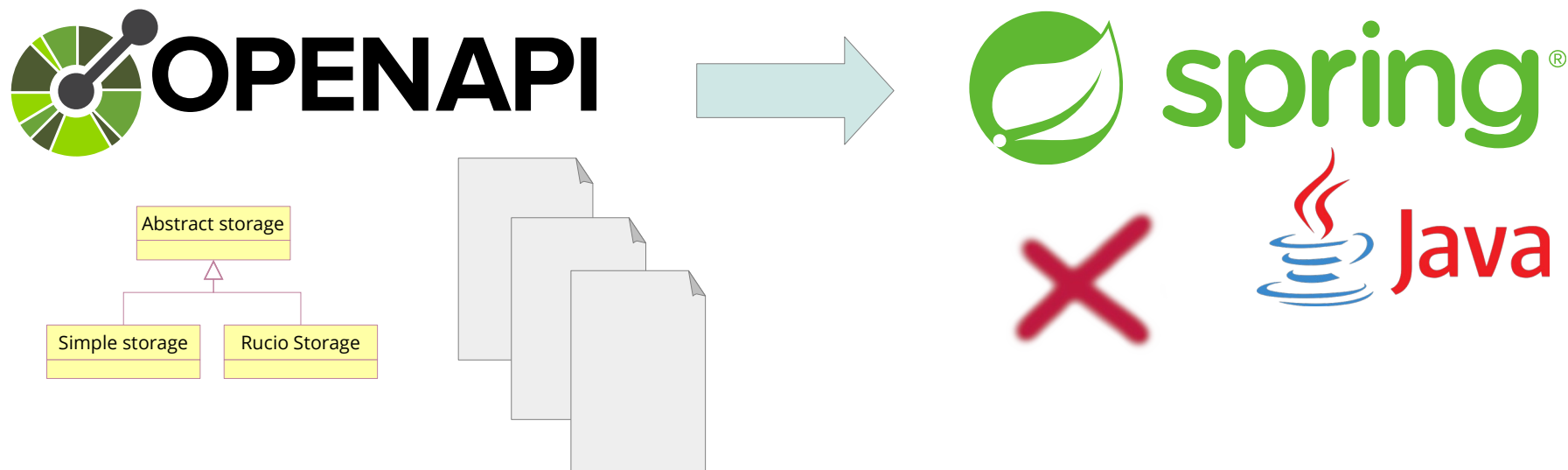
Content - type :

Accept :

What didn't work

Splitting the OpenAPI specification into separate files.

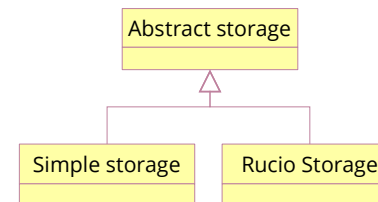
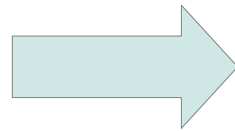
Java code generator loses the polymorphic inheritance links.



Would I use it again ? YES

Using a structured schema to define the service API is a huge benefit.

Writing clear and precise technical specifications in text is hard.



- Shallow learning curve
- Good documentation

- Clear and easy syntax
- Good feature coverage