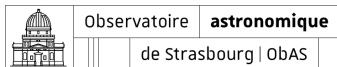


New Simbad ConeSearch implementation

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□ Implementation - Why new?

What was “wrong” with the previous implementation?

- Slow query responses
- No other output formats than VOTable
- No sorting options (by default on distance from target)
- Deprecated UCD1 (instead of UCD1+)
- Old code: Java Servlets



□ Implementation - Why fast?

- To make a quick interrogation of Simbad on a given sky position
 - Simbad data daily changes => not possible to have a cache or snapshot.
 - Filter by number of references instead of distance
 - *e.g. Simbad pointer in Aladin returns the source with the max. number of ref.*
- So, should be as fast as possible which was not the case..



□ Implementation - Evolution

- **Programming:**
 - Java 11
 - Web API framework: [Quarkus](#)
 - [Gradle](#) for dependencies management
- **Columns metadata:**
 - TAP_SCHEMA
 - Use same tables and columns as with Simbad-TAP
- **Performance improvement:**
 - Reactive programming
 - Native compilation



□ Features - Formats

- **Multiple response formats**
 - Parameter RESPONSEFORMAT (*defined by DALI*)
 - HTTP header Accept
 - VOTable (*last version: 1.4*)
 - JSON
 - FITS
 - CSV



□ Features - Size

- **Response size limit**
 - Parameter MAXREC (*defined by DALI*)
 - 0 to get only metadata
 - Upper limit defined by the server



□ Features - Sort

- **Sorting options**

- 2 parameters: ORDER_BY and ORDER_DIR
- ORDER_BY with the name of one of the output columns
(*default: distance*)
- ORDER_DIR: ASC (*default*), DESC



□ Features - Links

- **Columns link:**
 - Object name/identifier: link to the Simbad Web page of the object (e.g. *M1*)
 - Object type: link to the online object type description (e.g. *SNR*)
 - Available only in VOTable (*LINK* element) and JSON formats
 - Compatible with Aladin



□ Features - Parameters

SCS-1.03, sec. 2.:

*If a query includes an optional parameter, either one specified by this document or not, that is not supported by the service implementation, **the service must ignore that parameter.***

In this implementation:

- Incorrect parameter => ERROR
 - e.g. ORDER_BY or SORT_BY ; if SORT_BY is used, we want an error
- Incorrect parameter value => ERROR
 - e.g. unknown column name when ordering rows
- In both case, we need to see the error. Otherwise we will get a result which does not match our expectations.



Features - Data origin

- **Extra response metadata:**

Inspired from [DALI-1.1](#) and [draft note about data origin](#) from DCP.

INFO name	Value	Description
standardID	ivo://ivoa.net/std/conesearch	IVOID of the service specification
service_protocol	Simple Cone Search 1.03-extended	Used access protocol and version
publisher	CDS/SIMBAD	Data publisher
request	https://simbad.cds.unistra.fr/cone/?RA=0.0&DEC=0.0&SR=5.0&VERB=1&MAXREC=10&ORDER_BY=distance&ORDER_DIR=ASC&RESPONSEFORMAT=votable	HTTP request URL
request_date	2023-04-17T15:30:54.431033294+02:00	Query execution date
contact	cds-question@unistra.fr	Publisher email address
QUERY_STATUS	OK	Successful query



□ Features - UCD

- Use **UCD1+**
 - ID column: `meta.id;meta.main` instead of `ID_MAIN`
 - RA: `pos.eq.ra;meta.main` instead of `POS_EQ_RA_MAIN`
 - DEC: `pos.eq.dec;meta.main` instead of `POS_EQ_DEC_MAIN`



Features - Extra

- **Health**
 - /availability to do
- **Capability**
 - /capabilities to do
- **OpenAPI**
 - Document describing the Web API (e.g. parameters, HTTP response codes)
- **Online documentation**
 - Generated with Swagger
 - Generated from the OpenAPI document
 - Lets interactively run queries

Swagger UI | /openapi | Explore | simbad-conesearch 2.0 SWAGSHOT (powered by Quixia 2.3.1 Final)

Simbad ConeSearch API (development) 0.0 OAS3

Simple REST service implementing the IVOA protocol named ConeSearch.

CDS - Website
Send email to CDS

Servers
<http://simbad.cds.unistra.fr/cone>

ConeSearch

Run ConeSearch queries.

GET / Submit a ConeSearch query on the Simbad database.

Parameters

Name	Description
DEC * <small>required</small> number (float) <small>(query)</small>	The declination of the search cone's center in decimal degrees. It must be between -90 and 90. Example: 0 <input type="text" value="0"/>
MAXREC integer (int32) <small>(query)</small>	Maximum number of rows to return. 0 to only get metadata. Example: 2000 <input type="text" value="2000"/>
ORDER_BY string <small>(query)</small>	Available values : B, D, H, L, J, K, R, U, V, coord, dm, distance, main_id, morph_type, nb_ref, oids, oidsref, otype, otype_label, gid, gis, is, isolved, sp_type Default value : distance Examples: Distance from cone center <input type="text" value="distance"/>
ORDER_DIR <small>(query)</small>	Available values : ASC, DESC Default value : ASC Examples: Ascending order <input type="text" value="ASC"/>
RA * <small>required</small> number (float) <small>(query)</small>	The right ascension of the search cone's center in decimal degrees. It must be between 0 and 360. Example: 0 <input type="text" value="0"/>
RESPONSEFORMAT string <small>(query)</small>	Desired output format. It should be a MIME-type or a shortcut. Examples: VOTable shortcut <input type="text" value="VOTable shortcut"/>

Link: ... /cone/help/



□ Status

- **Old service:** *online (but closed at sometime)*
- **New service:** *online*
- **Registry:** *in progress*
- **Fallback parameter (v1.03):** *in progress*
- **Aladin & Topcat with new version:** *compatible*



□ Availability

- Service: <https://simbad.cds.unistra.fr/cone>
- OpenAPI:
<https://simbad.cds.unistra.fr/cone/openapi/>
- Documentation:
<https://simbad.cds.unistra.fr/cone/help/>

