# DAL Running Meeting #21 - Cone Search 1.1

**Date:** 4 September 2025, 1pm UTC

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## "recent" History

- Sep.-Oct. '24
  - text reverted to REC-ConeSearch-1.03 (including Errata - 3x)
  - clarified unique result RESOURCE
  - MAXREC added with SR=0 metadata overlap (see below)
  - RA & Dec decimal flexibility (float []and[] double)
  - UCDs ported to UCD1+
- July '25 (https://github.com/ivoa-std/ConeSearch/pull/64))
  - (Sec.2 main numbered list to subsections)
  - adding RESPONSEFORMAT
  - reworked successful response
  - changed error response to follow DALI behaviour
    - including OVERFLOW
  - RA & Dec decimal degrees response mandated
    - drawbacks?
  - MAXREC & SR metadata enquiries: clarify (see at bottom)
    - the current footnote needs anyway a small tweak, e.g.
      - from: "...MAXREC is optional and thus []SR=0 needs to be accepted[] for metadata probing."
      - to: "...MAXREC is optional while []SR is mandatory, that means that SR=0 must be set[] anyway for metadata probing."

## Issues remaining (and already set in the repo)

- Clear path
  - Resource registration (https://github.com/ivoa-std/ConeSearch/issues/62))
    - move SimpleDALRegExt-1.2 Sec. 3.1 in Cone Search or refer to it?
    - in both cases do minor updates to SimpleDALRegExt be needed?
  - OpenAPI document (https://github.com/ivoa-std/ConeSearch/issues/63)) (move to discussion)
    - add it to a non-normative Section or in Appendix or another, connected document?
  - .xsd & .vor updates (https://github.com/ivoa-std/ConeSearch/issues/38))

    - fix VOTable example (https://github.com/ivoa-std/ConeSearch/issues/18))
- "easy" additions
    - ConeSearch resource IVOID in response (https://github.com/ivoa-std/ConeSearch/issues/59)) - DataOrigin
    - https explicit (https://github.com/ivoa-std/ConeSearch/issues/48))
- Discussion topics
    - custom & optional parameters behaviour (https://github.com/ivoa-std/ConeSearch/issues/17))
        - => add an informative message in the response
    - main ID usage (https://github.com/ivoa-std/ConeSearch/issues/53))
        - "unique" mean unique in the table or dataset collection
        - Issue and text to review ; this should be solved for v1.1
        - [MT] the text is a bit half-baked as it stands: it says the ID "could be used to retrieve that same record again from that same table" but it doesn't say how, so this uniqueness requirement is not very well-motivated.
    - ConeSearch as a TAP profile?
        - currently has not an issue attached, needs some discussion/agreement
        - [MT] I think no. People doing TAP services will figure out how to make a ConeSearch service from them.

# Other "small" things (came up while reworking PR#64)

- missing DALI & SimpleDALRegExt in the architecture schema
    - refer to architecture v.1.2
- VOUnits
    - check services to see what their responses do with RA, Dec datatypes
- what are the constraints for the potential other table response formats? simply undefined?
    - a question for DALI, more general than ConeSearch alone
- VOTable MIME-type prescription order?
- Allowing a 2nd RESOURCE for a datalink service descriptor?
    - Yes, it is allowed.

After the document is WD mature: check implementations and validator(s).

### NOTE: "2.0" & "time" labelled issues should _really_ go to the major revision specification.

(meaning also that, when the ConeSearch-2.0 repo will be created, those issues will move there)

# MAXREC & SR - metadata search

A 1.03 client (app-1.03) can only query metadata using the SR=0 solution (metaquery-1.03).

A 1.1 client (app-1.1) can query metadata:

- with SR=0 only (metaquery-1.1-sr0) - discouraged
- with MAXREC=0&SR=0 (metaquery-1.1-all0) - clear, even if it looks redundant, but SR is a MUST
- with MAXREC=0&SR!=0 (metaquery-1.1-odd) - do you see a use case for this? technically possible, but...

What should be servers (1.03 and 1.1) responses?

- metaquery-1.03
  - server-1.03: OK, metadata response
  - server-1.1: OK, metadata response with version alert? (an INFO?)
- metaquery-1.1-sr0
  - server-1.03: OK, metadata response
  - server-1.1: OK, metadata response with deprecated alert? (an INFO?)
- metaquery-1.1-all0
  - server-1.03: OK, ignore MAXREC, metadata response
  - server-1.1: OK, metadata response
- metaquery-1.1-odd
  - server-1.03: OK, ignore MAXREC, but data response
  - server-1.1: syntactically OK, useless?, but behaviour undefined and metadata response

Note: unless apps claim their version compliance, there's no way for a server to distinguish among metaquery-1.03 and metaquery-1.1-sr0, thus a "version alert" might be unfeasible (use "deprecate alert" in both?).

In conclusion, to close the client-server-client roundtrip, we need a solution for the metaquery-1.1-odd case:

- forbid: server-1.1 returns an error: should both app-1.03 & app-1.1 need to be able to read it?
- allow: server-1.1 returns a data response with QUERY_STATUS=OK and an INFO alert? aligns app-1.03 and app-1.1 responses but overrides MAXREC=0 and OVERFLOW behaviour from DALI (unclear to MM the "server may try to execute and MAXREC=0 fails" situation described in DALI)

Note: reminder, MAXREC is optional (a SHOULD in 1.1) and will not be applied by server-1.03 anyway.

# General notes

- > RA & Dec decimal degrees response mandated
  - > drawbacks?
    - MM has checked several services from the registry and it seems to be fine : most services use decimal degrees
  - MAXREC & SR

        - [GM]: any parameter is 0 => returns metadata ; discourage SR=0
        - [TJ]:
            - In SIA1, multiple functions are covered by the size parameter including searching for ‘matching’ images or constructing images of that size.  The standard explicitly states:
    - *A special case is SIZE=0. For an atlas or pointed image archive this tests whether the given point is in any image. For a cutout or mosaic service this will cause a default sized image to be returned. The default image size is service-defined and may be a value considered appropriate for the service, for the given image or data collection being accessed, or for the object (if any) at the given position.*
        - So for SIA1, size=0 cannot be used in place of MAXREC=0 to ask only for metadata. So do we want to have cone use SR=0 in that way?  Personally, I’d prefer that MAXREC=0 be used to fetch metadata in all cases to avoid confusion.  (What does a cone search do when SR=0?  TBD.  Input coordinates within the uncertainty to catalog point coordinates, i.e., the closest you can get to an exact match?  Another question.)
        -
        - [MT]: If clients ask for MAXREC=0 and SR<>0 they're asking a weird question - I don't think it matters much if they get a weird answer.
        - Conclusion: change the concerned paragraph into: any of MAXREC and SR is equal 0 should return metadata
    - OpenAPI:
        - Discussion to have about case folding for parameters (RA; DEC; ...):
            - should we set upper or lower case?
            - In 1.03, all parameters are in upper case but one has to check the text into details to see if there is any constraint about it.
            - check to do with validators?
            - [MT] As far as I can see the text only uses RA, DEC, SR in upper case so (unlike DALI-compliant standards) we don't have a case-folding issue here, upper case is mandatory.  That should make the OpenAPI authoring straightforward in this respect.
- [TJ] (from chat): Drat, I have to go.  I added something I wanted to ask about, namely the fact that the current standard (unless I’ve missed an update) doesn’t allow a service descriptor to be added to cone results because it allows only one RESOURCE.  Can we change that? HEASARC’s cones are all failing because of this.
    - [MT] Answer: in PR#64 this is explicitly allowed: *'There must be a single RESOURCE with type="results" in the VOTable, and that RESOURCE must contain a single TABLE. Additional RESOURCE(s) are allowed to enable, e.g., DataLink service descriptors.'*