Nikolai Piskunov and all the JRA1-JRA2 workshop participants

Query → VAMDC → Databases → VAMDC → User

JRA1-JRA2 WORKSHOPS

EXPERIENCE, IDEAS, PLANS

YOU ARE A VAMDC USER NOW

- *Give me what I need*:
  - All transitions in this wavelength range
  - Collisional cross-sections between levels A and B
  - Levels of Fe II with energies below 10 eV
- and I would like results as a table with:
  - Level energies in cm^{-1} F10.3
  - Wavelengths in Å in vacuum F10.4
  - Level designations A40
  - References A60

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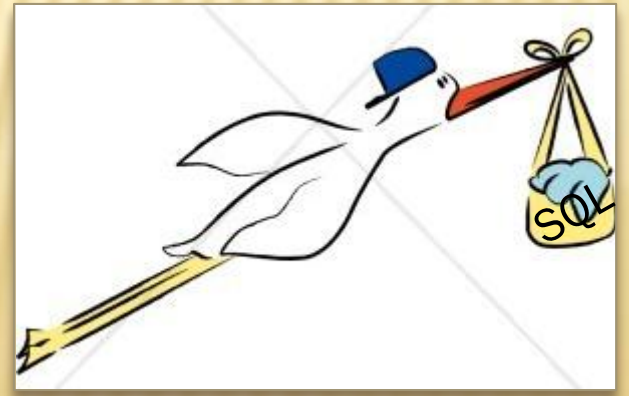
AS A USER YOU DON'T WANT TO KNOW

- exact locations of the requested data
- formats/units in which data is stored
- query languages of various DBs
- communication protocols/interfaces

Next step:



VAMDC
Registry

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AT VAMDC THE REQUEST IS PROCESSED

- Request is interpreted
- Registry is consulted
- Relevant DBs identified
- Requests are prepared for each DB either in **SQL** or in DB specific format
- Derived(?) requests are sent to the corresponding DBs

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AT THE DATABASE LEVEL:

Request from VAMDC

RECEIVER

Request understood by the DB

DB

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DATABASES (AMATEURISH VIEW)

We have 3 kinds of DBs in VAMDC:

1. Transition-oriented (wavelength is present in every record)
2. Level-oriented (level data is complete)
3. Bibliographic (references are complete)

Some are better suitable for table output and some – for an XML structure

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DATABASE DOES ITS THING, NOW THE RESULT

DB

Extracted data

CONVERTER

Results to VAMDC

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WHY THE XSAMS CONVERTERS ARE SO DIFFERENT?

DBs are different: some are structured closer to xSAMS than the others. Examples:

- BASECOL – links and values are similar to xSAMS entries
- VALD – linked lists: transitions, species, references (more like cross-linked tables)
- HITRAN & CDMS – transition-oriented but complex energy level classification and not exactly trivial to map to xSAMS

Is this what makes the performance so different?

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THE CONVERTER

- We discussed if the converter should be at DB or at VAMDC. The arguments for association with DBs:
  - Distribution of work load
  - VAMDC gets unified DB interface
  - Can be used locally for testing/certifying the converter software
  - Maintenance/sustainability pushed to DBs
- What should the converter do? Just present the data in xSAMS?

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THE CONVERTER

- We discussed two options for data format:
  1. xSAMS
  2. xSAMS-based table(s)
- We think that VAMDC should be able to handle both!
- An xSAMS-based table has columns that map precisely to specific places in xSAMS hierarchy.
- Need dictionary: xSAMS entry ↔ keyword

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RELATED ISSUE

- Unique species reference across VAMDC (for internal use only).
- Need a library that can interpret any popular species name convention and convert it to a unique ID and that other way as well.
- Will be a natural part of converter.
- See the work by Ken Smith

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VAMDC ASSEMBLER

- When the secondary request was send to just one DB, the reply is formatted according to user specs and sent back
- When several DBs are involved do we:
  - Multiple replies?
  - **Trivial merger?**
  - Reliable merger based on physics and quality?
  - ?

BIBLIOGRAPHY AND STATISTICS

- Each request should be registered
- The registration info must include:
  - request ID
  - user ID
  - time stamp
  - initial request
  - pointers to references for the extracted data
- Request ID must be returned with the reply to the user (not part of xSAMS)

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WHAT IS ALREADY IN PLACE?

- Query language **No**
- Registry **Yes** but poorly populated
- VAMDC parser **No** (but Asif is working on it)
- Receiver **Yes** for SQL DBs
- Converter **Yes** for BASECOL, CDMS, VALD, HITRAN etc.
- VAMDC assembler **No**

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PRIORITIES

1. xSAMS ↔ keyword dictionary
2. Query language prototype
3. Proper registry population
4. Receivers for several DBs
5. VAMDC assembler prototype
6. xSAMS compatible tables
7. xSAMS converter comparison, standard library

When and where? End of May in Cologne

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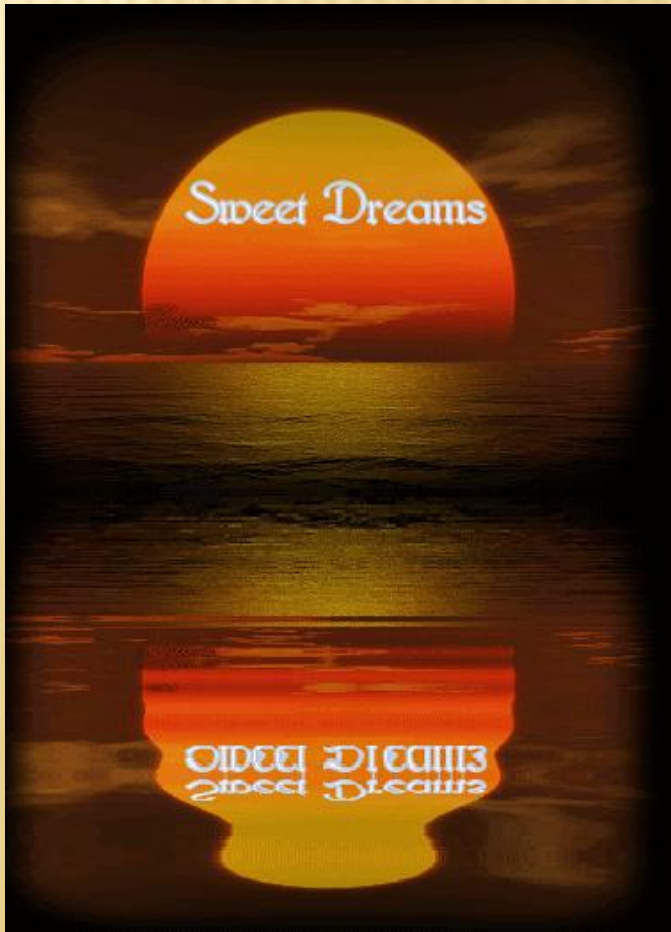
SUSTAINABILITY

- What if VAMDC will work all by itself? We just step aside and let it run
- DBs will handle updates and maintenance
- We can go back to EU and say: *Look at VAMDC – it is self-sustained and here is our next project…*



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