Theory Session II: Theory: future direction

- status of current standard developments
- discussion of and decisions on remaining issues
- Herve Wozniak Where are we ?
- Franck Le Petit Vocabulary
- Miguel Cervino Obervations, simulations and models: different ways to study Nature

Theory status 4 years later...

H. Wozniak

Goals of the presentation

- remind participants
  - where we come from,
  - where we are,
  - where we (hopefully) go
- discuss the roadmap

Current TIG status : the premises

- White Paper 'Theory in the VO', Feb 2004 (G. Lemon & J. Colberg)
- Cambridge US, May 2004
  - creation of TIG
  - early interest by GAVO, NVO, AstroGrid, VO-France and 'some others'
- Pune, Oct 2004
  - poll of VO national projects for representatives
  - start very preliminary UCD definition work (Laurie Shaw)
- Kyoto, May 2005
  - need of use cases
  - access to theoretical spectra issue
  - publication of theoretical datasets issue (data model needed)
  - interoperability of online service/application
- Madrid, Oct 2005
  - extraction of requirements from use cases
  - proposal of a cosmology TIG meeting in Cambridge UK
- Cambridge UK, Feb 2006
  - start of SNAP (Simple Numerical Access Protocol)
  - AstroGrid, DRACO, GAVO, NVO, VO-France

Current TIG status : the SNAP era

- Victoria, May 2006
  - start of Theory semantic vocabulary
  - SNAP
  - use cases discussions
- Moscow, Sep 2006
  - discussions on the DM, SNAP and Semantics
  - decision on an intermediate meeting
- Garching, Apr 2007: Euro-VO DCA SNAP meeting
  - realized the complexity of theoretical queries for discovery
- Beijing, May 2007
  - second version of the SNAP DM
- Cambrige UK, Sep 2007
  - test implementation of SNAP
  - further discussions on Semantics, SNAP DM, SNAP protocol

Current TIG status : the SimDB/μ-physics era

- ❑ Euro-VO DCA workshop 'Theory in the VO', Garching Apr 2008
  - ▪ Proceedings : http://sait.oat.ts.astro.it/MSAIt800209/
  - ▪ use cases, interoperability
- ❑ Trieste, May 2008
  - ▪ semantics and μ-physics simulations session
  - ▪ official splitting of SNAP in SimDB and SimDAP
- ❑ Baltimore, Nov 2008
  - ▪ issue on recommendation path for SimDB
  - ▪ S3 Note issued
- ❑ Strasbourg, May 2009
  - ▪ decision to split SimDB in two parts : DM and Services (TAP extension)
  - ▪ SimDB/DM continues under the auspices of the DM WG (SimDM)
  - ▪ decision to try to merge S3 and SimDAP
- ❑ Garching, Nov 2009
  - ▪ (slide #11… be patient!)

Useful documents

- http://www.ivoa.net/cgi-bin/twiki/bin/view/IVOA/IvoaTheory
  - every effort is linked to this page, even the VOLUTE (google SVN)

www.ivoa.net
Doc. Repository
Events
Projects
XML Schema

Project Pages

SimDB/SimDAP developments (structure table in progress)

Broad Topic	Details (WG-related)	Discussions	Goal	Main Contact (if any)
IVOATheorySimDB			Entry page for SimDB developments	G. Lemson
	IVOATheorySimDBDM		Details of Simulation Data Model	
		IVOATheorySimDBDMDiscussion	Discussions on the Simulation DM	
	IVOATheorySimDBTAP		Details on TAP implementation	
	IVOATheorySimDBRegistry		Relations with Registry	
	etc.		…	…
IVOATheorySimDAP[2]			Entry page for SimDAP developments	C. Gheller and R.Wagner

Other pages with useful information:

- SNAP and why SNAP has been split up in SimDB and SimDAP
- Simulation datamodel Most results of this effort can now be found in the volute SVN repository on GoogleCode, originally set up by Norman Gray.

Other developments

The following links (will) lead to TWiki pages where the results of projects are given

- Use cases
- Semantics
- Data formats
- General requirements
- Microsimulations

Theory Group Meetings

Follow these links to the Theory IG meetings - especially those at the IVOA Inter Op meetings. Here you will find the presentations made at those particular events.

Theory IG Session	At Meeting	When	Comments
IVOA.InterOpMay2010Theory	IVOA.InterOpMay2010	May 2010	Victoria
IVOA.InterOpNov2009Theory	IVOA.InterOpNov2009	Nov 2009	Garching
IVOA.InterOpMay2009Theory	IVOA.InterOpMay2009	May 2009	Strasbourg
IVOA.InterOpOct2008Theory	IVOA.InterOpOct2008	Oct 2008	Baltimore
IVOA.InterOpMay2008Theory	IVOA.InterOpMay2008	May 2008	Trieste
IVOA.InterOpSep2007Theory	IVOA.InterOpSep2007	Sep 2007	Cambridge, UK
IVOA.InterOpMay2007Theory	IVOA.InterOpMay2007	May 2007	Beijing
SNAP Workshop, Garching	Theory-IG meeting	Apr 2007	Garching, Germany
IVOA.InterOpMay2006Theory	IVOA.InterOpMay2006	May 2006	Victoria
Cambridge Theory Workshop	Theory-IG meeting	Feb 2006	Cambridge, UK
IVOA.InterOpOct2005Theory	IVOA.InterOpOct2005	Oct 2005	Spain
InterOpMay2005Theory	IVOA.InterOpMay2005	May 2005	Kyoto
InterOpSep2004Theory	IVOA.InterOpSep2004	Sep 2004	Pune
InterOpMay2004Theory	IVOA.InterOpMay2004	May 2004	CfA, Boston: Kick off meeting

Useful documents

- http://www.ivoa.net/cgi-bin/twiki/bin/view/IVOA/IvoaTheory
  - every effort is linked to this page, even the VOLUTE (google SVN)
- Theory in the VO (G. Lemson & J. Colberg)
  - http://ivoa.net/pub/papers/TheoryInTheVO.pdf
- Euro-VO DCA workshop 'Theory in the VO', Garching Apr 2008
  - Proceedings : http://sait.oat.ts.astro.it/MSAIt800209/
- Euro-VO DCA White Paper, Dec 2008
  - http://cds.u-strasbg.fr/twikiDCA/pub/EuroVODCA/Deliverables/EuroVO-DCA_D11_MPG_Final.pdf
  - theory requirements (12 pages of recommendations)
  - who has read this ?
  - Points addressed : VO framework, Participation, Standardisation, Implementation, Data formats, Resource allocation
  - recommendations for : Scientists (producers, publishers, users, institutes) ; IVOA ; National VO

Euro-VO DCA White Paper

- Participation (**Scientist**).
    - Publication: Scientific results MUST be made available online. (**Publisher**)
    - Usage: Online resources SHOULD be used by scientists. (**User**)
- Standardisation
    - Definition: Interoperability standards MUST be defined. (**IVOA**)
    - Participation: The scientific community MUST be involved in the standardisation process. (**Scientist**)
- Implementation
    - Mapping: metadata SHOULD be assigned to published data sets and services according to IVOA data model standards. (**Publisher**)
    - Protocols: services SHOULD implement IVOA standard protocols. (**Publisher**)
    - Data formats: Services SHOULD provide results in an IVOA-standard data format. (**Publisher**)
    - Applications: VObs aware client tools SHOULD be written. (**national VOs**)
    - Registration: Online resources MUST be registered in an IVOA compatible resource registry. (**Publisher**)
- Resource allocation
    - Standardisation efforts MUST be supported. (**Institute, national VOs**)
    - Implementation efforts MUST be supported. (**Institute, national VOs**)
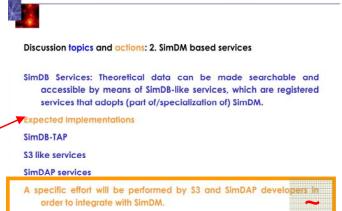   - Outreach SHOULD be supported. (**Institute, national VOs**)

Current TIG status : the last INTEROP

□ **Garching, Nov 2009**

Discussion **topics** and **actions**: 1. Simulation Data Model, SimDM

The model is mature to be moved to a working draft to be submitted
the DM WG (to become finally a recommendation). **+**
Two documents (description and UML representation) + XML schema
almost ready
Some issues are still to be solved
• Reference implementations (almost solved, see next slides) **+**
• Adoption of a vocabulary (SKOS) **-**
• Registration issues **~**
• ...

Garching, November 2009

Discussion **topics** and **actions**: 2. SimDM based services

SimDB Services: Theoretical data can be made searchable and
accessible by means of SimDB-like services, which are registered
services that adopts (part of/specialization of) SimDM.
Expected implementations
SimDB-TAP
S3 like services
SimDAP services
A specific effort will be performed by S3 and SimDAP developers in
order to integrate with SimDM. **~**

Garching, November 2009

Discussion **topics** and **actions**: 3. Theory compliant applications

S3 developers pointed out how few VO-compliant applications can
discover and handle theoretical data and services (like those
provided by VOSA or BASTI)
S3 group will lead the effort to "fill the gap" between theory and other
IVOA WGs (as APPs or DAL) **-**

Garching, November 2009

Discussion **topics** and **actions**: 4. Data Access Applications

Simulation Data Access protocol has not evolved too much, but it is not
far from being specified in all details. Main open issues are
• Metadata and Query (TAP-like) services → SimDB/TAP? S3 like?
• Cutout/Download response → specify the format
• What kind of preview?
S3 express the interest for a selection function similar to the Cutout (but
on general variables)
SimDAP could be similar to S3 for metadata access and data discovery.
SimDAP and S3 groups will coordinate the effort in order to produce a
single protocol **-**
Some differences in preview vs. summary…

Garching, November 2009

Discussion **topics** and **actions**: 5. Existing services

SimDB implementation @ VO Paris Data Center (France VO)
• PDR database (photodissociation regions)
• Starformat (MHD simulations if ISM) → Reference implementations for SimDM
• DEUVO (Dark Energy Virtual Observatory)
VOSA, a VO Spectral Energy Distribution Analyzer (Spanish VO)
Asteroseismology service (Spanish VO)
Basti for stellar model simulations (Italian VO)
VisIVO web/server for visualizing cosmological simulations (Italian VO)

Garching, November 2009

Current TIG status

- Actions in progress
  - Simulation Data Model: SimDM
    - the DM part of the SimDB proposal
  - SimDB services part
    - TAP interface, VOSI, Registry, etc.
  - Semantic
    - permanent action to improve, update, increase,… the vocabulary
    - extremely important for DM

Current TIG status

- Services/applications implementation/development
  - many DB of simulations
    - 3D+Time: CADAC, CINECA, StarFormat
    - non-spatial: PDRDB
    - several scientific cases: cosmology, cluster of galaxies, star formation, cloud collapse, photodissociation,...
    - several physical scenarios: pure dark matter, hydrodynamics, chemistry, ...
  - many 'computing' or 'data access' services
    - stellar isochrones/evolutionary tracks
    - synthetic photometry
    - astrosismology models
    - ...
  - a few implementations of standard under developments
    - SimDB/DM : GAVO, VO-France, NVO?, VObs.It (in the future?)
- we have enough services to play with and test preliminary standards (Sim*)

Future direction

- ❑ **SimDB/DM (SimDM)**
  - ▪ write the specification in IVOA document format with DM collaboration
  - ▪ entrust SimDM to DM WG
  - ▪ timeline :
    - ❑ specification finalization on end of June
    - ❑ recommendation pathline during summer
    - ❑ REC by EXEC in Nara
- ❑ **SimDB Service**
  - ▪ need to query on a SimDB service
  - ▪ rely on several others IVOA standards
    - ❑ semantics vocabulary
    - ❑ TAP
    - ❑ VOSI
    - ❑ what else ?

To Do List & Questions

- SimDB:
  - TAP async required for SimDB?
  - REST+XML?
  - VO-URP in spec?
  - Vocabulary
  - Need comments on simulation data model from TIG to finalize it
- SimDAP/S3
  - Standard operations?
  - Description of custom operations
  - Response format
  - Prototype services to test using service description for interface generation
  - Needs to pick a name
- Registry harvesting using VOSI GetCapabilities is critical for SimDAP/S3

R. Wagner   Theory Interest Group Summary

Future direction

- SimDAL (SimDAP+S3)
  - becomes very urgent !
  - Claudio leads the effort (with Rick shared time)
  - need test implementations
    - CINECA (Claudio et al.)
    - CADAC (Rick)
    - StarFormat, PDRDB ?
  - write the specifications
    - current version on volute
  - list of issues:

To Do List & Questions

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  - TAP async required for SimDB?
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  - Vocabulary
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R. Wagner   Theory Interest Group Summary

Actions and Roadmap

- Actions
  - Semantics   Franck & Fabrice
  - SimDM to REC   Gerard & Mireille
    - finalize specification document
    - finalize implementation notes
  - mapping of all theory services (SVO, CINECA)
    to SimDM   Miguel, Carlos, Patrizia, VO-Paris
  - SimDAL prototyping and specification writing Claudio & Rick
  - SimDB/service (TAP etc.)   Gerard & 'Baltimore' team

Actions and Roadmap

- Roadmap
  - Next INTEROP (7-13 Dec 2010 @ Nara, Japan)
  - BEFORE :
    - regular telecon of core TIG + DM (Louys, Wozniak, Gheller, Cervino, Lemson, Le Petit, Ooghe, Rodrigo Blanco, Wagner, Bourgès) on writing SimDM specification
    - who is writing what (TBD DM+TIG session)
    - an intermediate meeting ?
      - when ? September ?
      - what ? SimDB/SimDAL if in September
      - where ? Strasbourg ? (central wrt Bologna-Madrid-Munich-Paris)
  - At Nara INTEROP
    - Top priorities : SimDAL, SimDB, Semantics