Presentation by Michael Hucka at

**COMBINE 2011**

http://co.mbine.org/events/COMBINE_2011

Sunday, 4 September 2011
General updates about SBML and SBML Team activities

Michael Hucka and the rest of the SBML Team

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Outline

1. SBML.org Updates
2. SBML Development
3. SBML Team Software
SBML.org updates
SBML Software Guide changes

SBML Software Guide

The following pages describe SBML-compatible software packages known to us. We offer different ways of viewing the information, all drawn from the same underlying data collected from the systems' developers via our software survey. The Matrix provides a table listing all known software and a variety of their features; the Summary provides general descriptions of most of the software; and the Showcase provides a sequential slideshow of a subset of the software.

Number of software packages listed in the matrix today: 230.

Go to the SBML Software Matrix
Go to the SBML Software Summary
Go to the SBML Software Showcase

Please use the survey form to notify us about additions and suggestions.

[edit] Historical trend

The following graph shows the total number of known SBML-compatible software packages each year, as counted by the SBML Team. The counts shown are for approximately the middle of each year.
New version of the SBML software survey

SBML Software Details Questionnaire

General information about your software

Please fill out this form to tell us about your SBML-compatible software. We will use this information to update the SBML Software Guide. We may also use the information to write papers about SBML software.

What is **your name**? (This is to verify the info you enter in this form; your name will not be put in the SBML Software Guide.)

What is **your email address**? (Again, this is to verify the information you enter; your name will not be put in the Guide.)

What is the public **contact address** for the software? Generally this is an email address (possibly the same as the one above, if you wish), although it can be an online help form instead.
Forthcoming in the SBML Software Guide

More data about SBML software in the world

More accurate data about SBML software in the world

Statistics about SBML software in the world

- Examples: data on 81 software tools reported between May–July

Percentage supporting SBML Level 3

- Supports SBML Level 3: 36%
- Does not yet support Level 3: 64%

Total # tools supporting other standards

- MIRIAM: 16
- SBO: 14
- SBGN: 13
- BioPAX: 6
- CellML: 3
- SED-ML: 3
- MFAML: 1
- PNML: 1
- SBOL: 1

Updated SBML Level 3 package activity table

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3 Core</td>
<td>core</td>
<td>The core portion of SBML Level 3.</td>
<td>sbml-discuss</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td>layout</td>
<td>Support for storing the spatial topology of a model's network diagram. Adjunct to the render package, below.</td>
<td>sbml-layout</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Flux Balance Constraints</td>
<td>fbc</td>
<td>Support for constraint-based (a.k.a. steady-state) models.</td>
<td>sbml-flux</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Rendering</td>
<td>render</td>
<td>Support for defining the graphical symbols and glyphs used in a diagram of the model. Adjunct to the layout package above.</td>
<td>sbml-render</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Hierarchical Model Composition</td>
<td>comp</td>
<td>A means for defining how a model is composed from other models.</td>
<td>sbml-comp</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Qualitative Models</td>
<td>qual</td>
<td>Support for models wherein species don't represent quantity of matter &amp; processes are not reactions per se. (E.g.: Boolean nets.)</td>
<td>sbml-qual</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Annotations</td>
<td>annot</td>
<td>Support for richer annotation syntax than the regular annotations in SBML Level 3 Core.</td>
<td>sbml-annot</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Spatial Processes</td>
<td>spatial</td>
<td>Support for describing processes that involve a spatial component, and describing the geometries involved.</td>
<td>sbml-spatial</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>groups</td>
<td>Support for groups of SBML entities. This partially replaces the Level 2 SpeciesType and CompartmentType constructs with a</td>
<td>sbml-groups</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Required Elements</td>
<td>req</td>
<td>elements that have been changed by the software.</td>
<td>sbml-required</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
</tbody>
</table>

[http://sbml.org/Community/Wiki](http://sbml.org/Community/Wiki)
SBML Development
SBML Development Process Progress

SBML Development Process

An intrinsic aspect of SBML's development has been the adoption of a participative, community-oriented approach. In the early years of SBML, this process was highly informal. The use of SBML has grown to the point where its original, informal approach to development is no longer sufficient to meet the needs of the SBML community and the continued evolution of SBML. Beginning in 2003, the SBML Team and SBML Editors have been working to put into place a more formal organization and systematic process, one that will be less ambiguous and subjective and more responsive to the needs of the SBML community. This page describes the plans for this SBML Development Process, and the current status of its implementation.

This SBML Development Process is being followed as of mid-2008.

The process described here evolved from previous proposals and discussions, and supercedes all previous SBML Development Process descriptions and proposals. (Previous proposals were presented at the following SBML Forum meetings: the 7th, the 10th, the 11th, and the 12th.) Some readers may recall that previous proposals involved additional components not described here (such as the formation of a SBML Editorial Board). These ideas were dropped in favor of simplifying the SBML Development Process as much as possible.

http://sbml.org/Documents/SBML_Development_Process
Elaboration of process for Level 3 packages

SBML Development Process for SBML Level 3

The overall SBML Development Process is detailed on a separate page. The present page describes specific aspects of the process that concern the development of SBML Level 3.

SBML Level 3 is modular, in the sense of having a defined core set of features and optional packages adding features on top of the core. This modular approach means that models can declare which feature-sets they use, and likewise, software tools can declare which packages they support. It also means that the development of SBML Level 3 can proceed in a modular fashion. The development process for Level 3 is designed around this concept.

Packages take significant time and effort to develop. It would be unreasonable to require the production of a complete specification for a package before the SBML Forum is asked to vote on whether the package is even considered worthwhile and appropriate for SBML Level 3. Therefore, the development of packages is divided into two main stages:

- The proposal development stage
- The specification development stage

This separation means that proposals for packages may be produced at relatively low cost in terms of effort, time and other resources. As explained below, the specification stage requires more effort, including software implementations. Only after the purpose and general outline of a proposed package are accepted does the full specification need to be produced.

[edit] The package proposal development stage

At this time (December 2008), a specification for the core for SBML Level 3 is in development, and no official packages exist yet. The following process is thus only partially specified. The process is summarized in the following flowchart and explained
Further elaboration of package voting criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility</td>
<td>Agree, Disagree, Insufficient information, Abstain</td>
</tr>
<tr>
<td>Biological orientation</td>
<td>Agree, Disagree, Insufficient information, Abstain</td>
</tr>
<tr>
<td>Coherence</td>
<td>Agree, Disagree, Insufficient information, Abstain</td>
</tr>
<tr>
<td>Orthogonality</td>
<td>Agree, Disagree, Insufficient information, Abstain</td>
</tr>
</tbody>
</table>

**Overall assessment of the package proposal:**
- **Accept:** proposal addresses a need that SBML should cover, and the approach clearly follows the stated principles
- **Reject:** proposal does not address a need that SBML should cover
- **Revise:** approach either does not follow the stated principles, or there is insufficient information to tell if it does
- **Abstain:** I cannot fully assess the proposal as given, or do not wish to state an opinion

In addition to the above, the voting form will include comment boxes that allow voters to provide more detailed feedback about the proposal and why they voted the way they did.

**Formula for assessing the outcome**

To assess the outcome of the vote, the SBML Editors will use only the question titled "Overall assessment of the package proposal" in the form described above. The formula to be used is as follows:

1. For the decision to be accept, 50% or more of the non-abstaining voters must have chosen the accept option.
2. For the decision to be reject, more than 50% of the non-abstaining voters must have chosen the reject option.
Writing L3 package specs

Proper draft spec. for Hierarchical Model Composition almost ready

New LaTeX templates for SBML package specifications
SBML Editor vote coming up

One new editor being replaced

- Nominations & voting open to anyone on sbml-discuss mailing list
SBML Editor vote coming up

One new editor being replaced

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libSBML 5.0.0: over 3400 downloads since April

Downloads of all libSBML 5.0.0 distributions since April
Other software news

LibSBML, JSBML, SBML Toolbox, Online SBML Validator, others....

... Listen to Sarah, Frank, Nico & Andreas