

libsbml Developer's Manual

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1.1 Linux, Solaris, Cygwin or MacOS X

1 Quick Start

libsbml requires a separate XML library for low-level XML tokenizing and Unicode support. It currently supports the Xerces-C++ and Expat XML libraries on Linux, Solaris, Windows and MacOS X. You will first need to make sure one of these libraries is installed on your system. Many Linux systems provide one or both of these libraries either as part of their standard distribution or as an optional RPM or Debian package. For more information, see <http://xml.apache.org/xerces-c/> for Xerces and <http://expat.sf.net>



```
./configure --with-xerces=/sw
```

During the installation phase (i.e., during `make install`, discussed below), the `libsbml` installation commands will copy header files to `/usr/local/include/sbml` and (shared and static) library files to `/usr/local/lib`, by default. To specify a different installation location, use the `--prefix` argument to `configure`. For example,

```
./configure --prefix=/my/favorite/path
```

Of course, you can combine the flags to `configure`, giving both `--prefix` and `--with-expat` or `--with-xerces`

3.3.2 Memory Tracing

In addition to the unit tests, a custom memory tracing facility is available. It is disabled by


```

typedef struct
{
    SBASE_FIELDS;
    char    *id;
    char    *name;
    char    *compartment;
    union
    {
        double Amount;
        double Concentration;
    } initial;
    char    *substanceUnits;
    char    *spatialSizeUnits;
    int     hasOnlySubstanceUnits;
    int     boundaryCondition;
    int     charge;
    int     constant;
} Species_t;

```

Figure 1: Example: the definition of SBML's Species in UML (left) and the corresponding Species_t C struct (right) in libsbml. SBASE_FIELDS is part of the OOP-liOe style used to implement objects in C; it is a macro that expands into the fields defined by SBase. The use of a union for amount and concentration reflects that these two fields are mutually exclusive in the SBML Species definition.

To instantiate (create) an object use either the XXX_create() or XXX_createWith() constructor. To destroy (free) an object use XXX_free().

4.3 Accessing Fields


```
int Species.isSetCharge (const Species_t *s)
```

Returns 1 if the charge of this Species has been set, 0 otherwise.

4.4 Lists

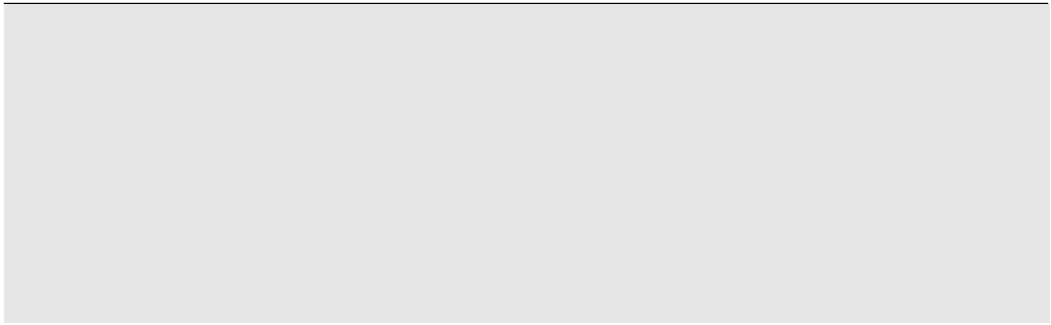
The last item in the enumeration, `UNIT_KIND_INVALID`

void SBBase_setNotes (SBBase_t *sb, const char *notes)

Sets the notes field of the given SBML object to a copy of notes. If object already has notes, the existing string is freed before the new one is copied.

void SBBase_setAnnotation (S

not have a direct correspondence in SBML Level 1. (But, it is created by `libsbml`



5.2 XML Schema Validation

To have libsbml validate an SBML document against an SBML (XML) Schema when using a Schema-aware parser such as Xerces requires creating an SBMLReader object and setting the

Many software packages provide users with the ability to express formulas for such things as reaction rate expressions, and these packages' interfaces often let users type in the formulas directly as strings. `libsbml` provides two high-level functions for working with mathematical

Section 6.4 describes some additional points that are worth knowing about the mathematical formula handling in `latex`. For example, Level 1 formula strings and Level 2 MathML expressions can be interconverted.

to set the level to 2, the model structure at that moment is translated internally so that such things as object names are converted to i d's (which do not exist in Level 1).

```
1 #include <stdio.h>
2 #include "sc5#SdBdMdLdTdydpdes#(.)-105h)-105>
```

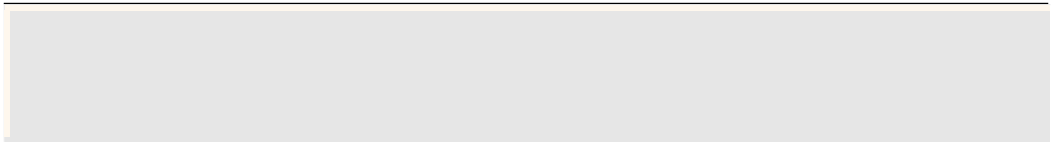
10 Acknowledgments

Thanks to Mike Hucka for updating and editing this manual for version 2.0 of I ibsbml

AST.PLUS	AST_FUNCTION_ARCCOTH	AST_FUNCTION_POWER
AST.MINUS	AST_FUNCTION_ARCCSC	AST_FUNCTION_ROOT
AST.TIMES	AST_FUNCTION_ARCCSCH	AST_FUNCTION_SEC
AST.DIVIDE	AST_FUNCTION	



Programs manipulating AST node structures should check the type of a given node before calling



References

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Bornstein, B. J. (2004). LibSBML API reference manual. Available on the Internet at <http://www.sbml.org/software/libsbml>.

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