

MMiSS: Repository, Development Graph and Authoring Tools

Christoph Lüth, Dieter Hutter

April 2003

Introducing: the Repository

- What is a **repository**?
 - central database of **all documents** and their **history**

Introducing: the Repository

- What is a **repository**?
 - central database of **all documents** and their **history**

- What does it do?
 - **Version control**
 - **Configuration management**
 - **Management of change**

Introducing: the Repository

- What is a **repository**?
 - central database of **all documents** and their **history**

- What does it do?
 - **Version control**
 - **Configuration management**
 - **Management of change**

- **Well-known** from Software Engineering
 - RCS, CVS, make, . . .

Introducing: the Repository

- What is a **repository**?
 - central database of **all documents** and their **history**
- What does it do?
 - **Version control**
 - **Configuration management**
 - **Management of change**
- **Well-known** from Software Engineering
 - RCS, CVS, make, . . .
- **New**: application to MMiSS documents.

The MMiSS Repository

- Fine-grained approach.
- Objects: **semantic units** and **atoms**
 - sections, definitions, theorems, text fragments . . .
- **Folders** allow grouping of objects.
- **Relations** between objects:
 - Sharing (inclusion)
 - Structural links (explicit or implicit)
- **Aims:**
 - keep track of dependencies
 - maintain consistency

User Interaction with the Repository

- Different versions \rightsquigarrow version graph
- Dependencies between objects \rightsquigarrow structure graph
 - `lives_in`, `is_contained`, ...

User Interaction with the Repository

- Different versions \rightsquigarrow **version graph**
- Dependencies between objects \rightsquigarrow **structure graph**
 - `lives_in`, `is_contained`, ...
- **Visualisation** of repository as a **graph**
 - dag, starting with **root folder**
 - user-defined **views**
- Editing by **direct manipulation**

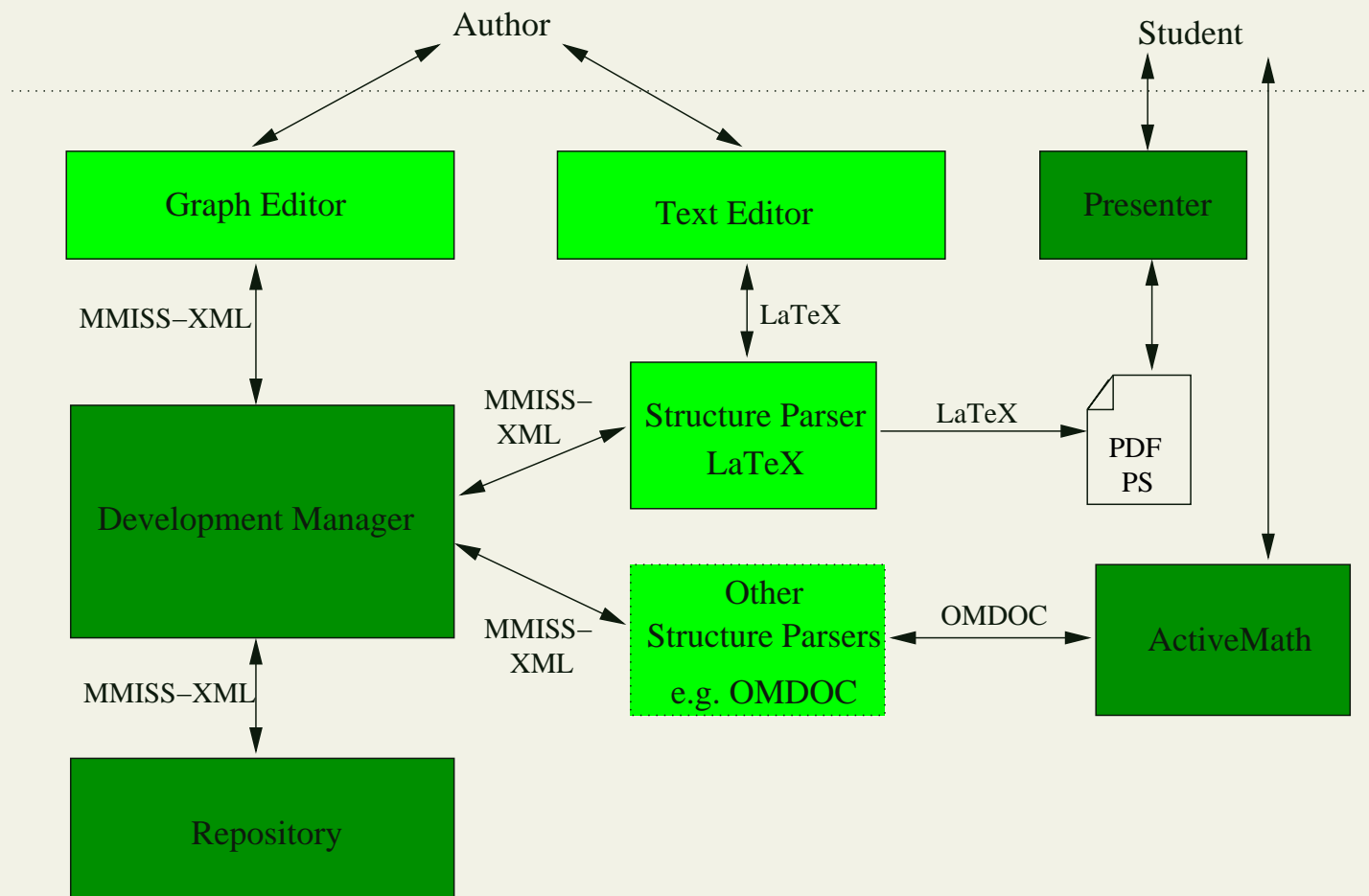
Tool Interaction with the Repository

- Repository exchange format: MMiSS-XML
 - XML format based on “MMiSS Document Structuring Facilities”
- User does not want to read XML but:
 - L^AT_EX with text editor
 - WYSIWYG tools
 - Method-specific tools

Tool Interaction with the Repository

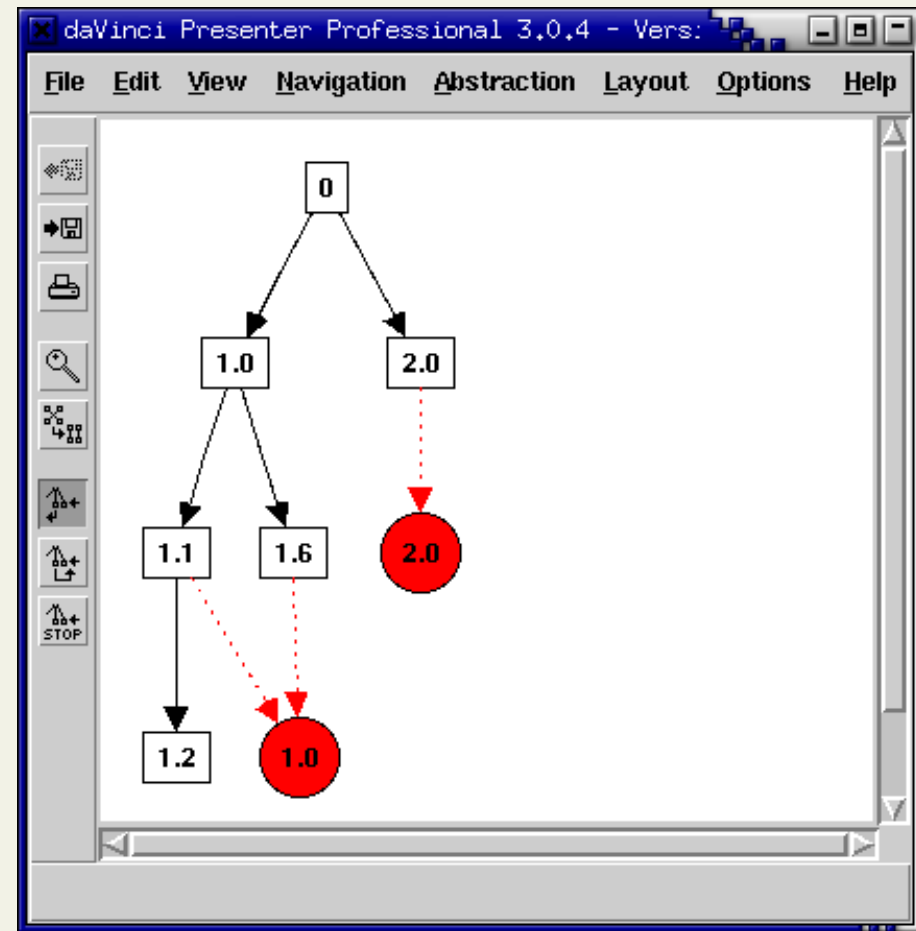
- Repository exchange format: MMiSS-XML
 - XML format based on “MMiSS Document Structuring Facilities”
- User does not want to read XML but:
 - L^AT_EX with text editor
 - WYSIWYG tools
 - Method-specific tools
- Structure parser for external exchange formats.
- External exchange formats:
 - L^AT_EX, OMDOC (planned), . . .

MMiSS Workbench System Architecture



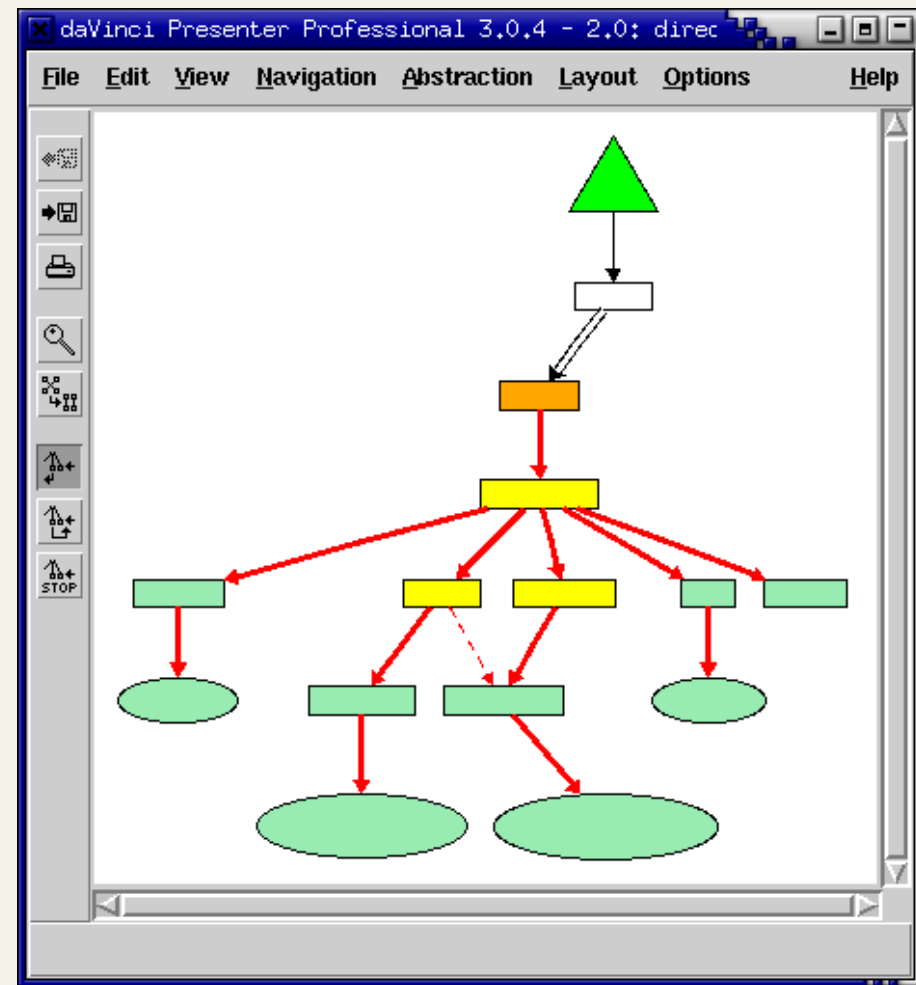
MMiSS Version Graph

- Checkout to edit
- Commit back to repository
- Merge
- Shared View



MMiSS Structure Graph

- **Folders** contain other objects
- Operations per **object menu**
 - **Create** folders & objects
 - **Edit** objects
 - Display and select **variants**
 - Export and preview
- **Private** View
- One per checked-out version



Authoring Tools: XEmacs

- M μ SS \LaTeX mode
 - Insert M μ SS \LaTeX elements, commands, etc.
 - cf. AuCT \LaTeX
 - Parsing on-the-fly
 - Driven from workbench
- Active buttons for elements
- Synthesis of structured and textual editing

```

emacs: IntroAlgSpec
File Edit View Cnds Tools Options Buffers Command LaTeX MμSSTeX I
IntroAlgSpec
[IntroAlgSpec:
\begin{Section}
[Label={IntroAlgSpec},
Title={Signatures,
Terms and Algebras}]
[Abstract]
[Intro:
\begin{Introduction}
[Label={Intro},
Title={Why Formal Specification?}]
[Reasons]
\end{Introduction}]
[Signatures]
[Algebra]
[Summary]
\end{Section}]
IS08--*-XEmacs: IntroAlgSpec (MμSSTeX Fill)---
Not over a window.
  
```

Outlook

- Authorisation & Authentifikation
- Access Control
- Intelligent Merging

The Implementation

- Implemented in **Haskell** (80 Kloc)
- Based on **events** as central notion of interaction
- Provides **encapsulations** for
 - daVinci,
 - Tcl/Tk (HTk),
 - XEmacs
- **Generic** content model (other XML formats)
- Uses
 - BerkeleyDB (<http://www.sleepycat.com>) as database
 - HaXML for generic content model

Summary

- repository holds all **documents** and their **history**.
- Provides
 - configuration management and version control,
 - management of change,
 - conversion between different formats.
- XEmacs with M_MiS_SL_AT_EX mode
 - Textual **and** structural editing
 - Closely coupled to repository
- Please **download** it at <http://www.mmis.de>.
- Wanted: **user feedback**.

Roll Of Honour

George Russell
Achim Mahnke
Arne Lindow
Markus Roggenbach
Serge Autexier
Carsten Ullrich