Putting Bernina on the Web
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Mathematics on the Semantic Web
The \textsc{Berina} package
(e.g. Interfacing with OpenMath, handling SOAP messages)

- No support for building (web) Aldor services
- External format of objects: Lisp, Maple, or LaTeX
- Standard IO for communication (stdin, stdout, sockets)

Bernina Internals
Play with the Berntina demo web site:

- communicate through files (e.g., with Maple)
- use Berntina interactively
- download Berntina locally

How to use Berntina?
Use of a broker/planner to perform computations

Discovery of Bernina through MONET brokers

Standard languages (MSDL, PDL, and so on)

Increase Bernina's accessibility and visibility

Exporting Bernina functions as (MONET) web services

Bernina as a MONET web service
Example with a Darboux service:

Bernina in the MONET context
Service description: WSDL file
Problem description: PDL file
Service description: MSDL file
<definitions>
  ...
</definitions>

<service/>
</broker-interface>
</service-metadata>
<service-binding/>

</message-part="darkboxResponse">
  <message-name="darkboxResponse">
    <to-ref="dretun">
      <message-configuration>
        </message-name="darkboxRequest">
          <message-part="tne0">
            <map-operation="darkbox" problem-ref="Darkbox">

<service-binding/>
Web services layer: Axis, Glue, ...

Web servers: Tomcat, Apache, ...

What about Maple, Mathematica, Aldor, ...

Specific environments:

Programming languages: Java, .NET, Perl

Web services: SOAP and WSDL

Technologies
Both worlds

Solution: We create an adapter that will fill the gap between

Problem: How to link the Bernina back-end program

We choose Java as it is multiplatform

Linking Bernina to MONET
Implementation
We also need richer ontologies to describe mathematical objects (e.g., OpenMath).

Like the ones solved by Bermina (e.g., Darboux),

Currently, there is no classification for problems.

Bermina to experiment with the MONEF framework.

It would be useful to have other examples such as

... (as a web service using a simple software adapter)

Bermina does not have to be modified to be exposed.

Comments on this experiment
Future work

• Towards registration of Bernina in a broker as web services

• Write a user guide to expose mathematical software can be used from inside Maple

• Finalize implementation and show that Bernina