Improving the usability of Kenzo, a Common Lisp system for Algebraic Topology

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Symbolic Computation Systems

Traditionally, symbolic computation systems have been oriented to research.

In the area of Computer Algebra Systems.

- Efficiency.
- Extension of the scope of the applications.

In the area of interoperability among symbolic computation systems.

- Universality of the Middleware.

In summary, we are always looking for more powerful systems. However, our systems became so powerful, that we can lose users or interactions.

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Weak Points in Kenzo:

- Usability
- Accessibility

Solution:

Construct an *Intermediary Layer*, allowing us an *intelligent access* to some features of the system.

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Microkernel architecture of the system

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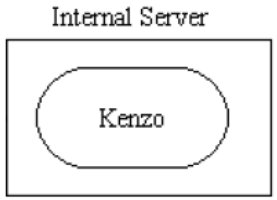

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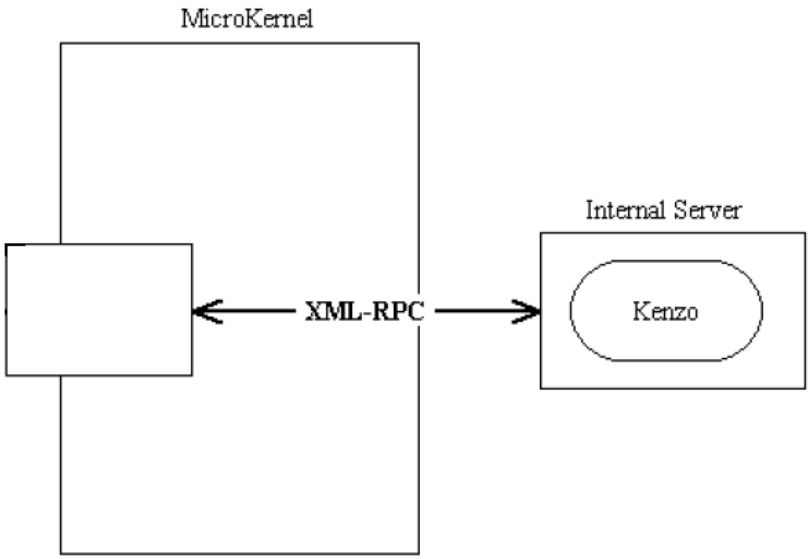

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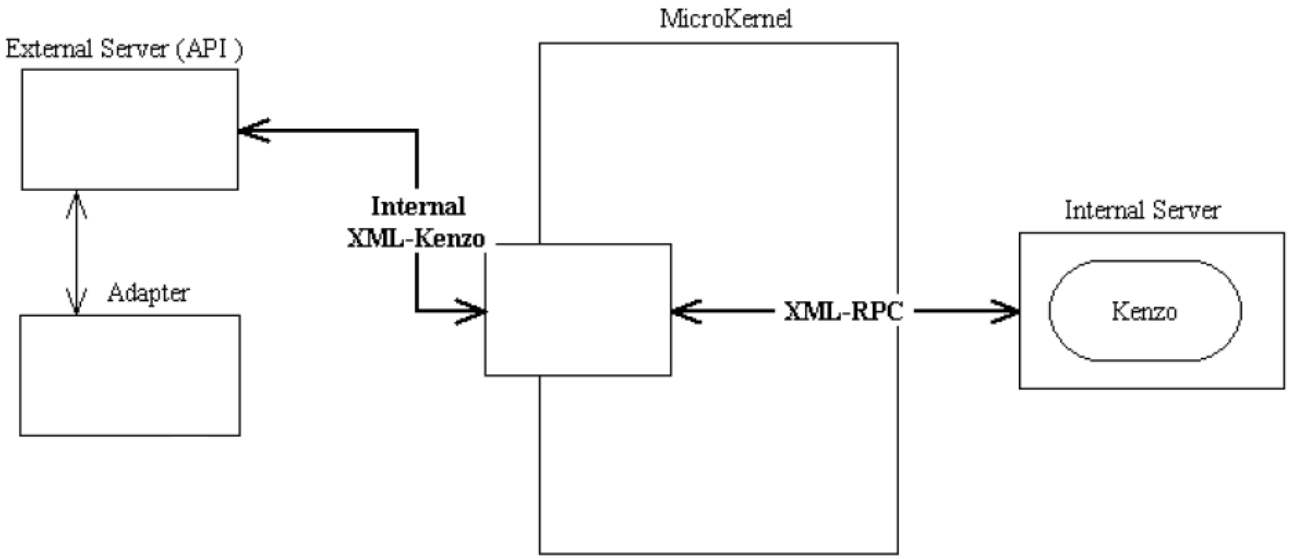

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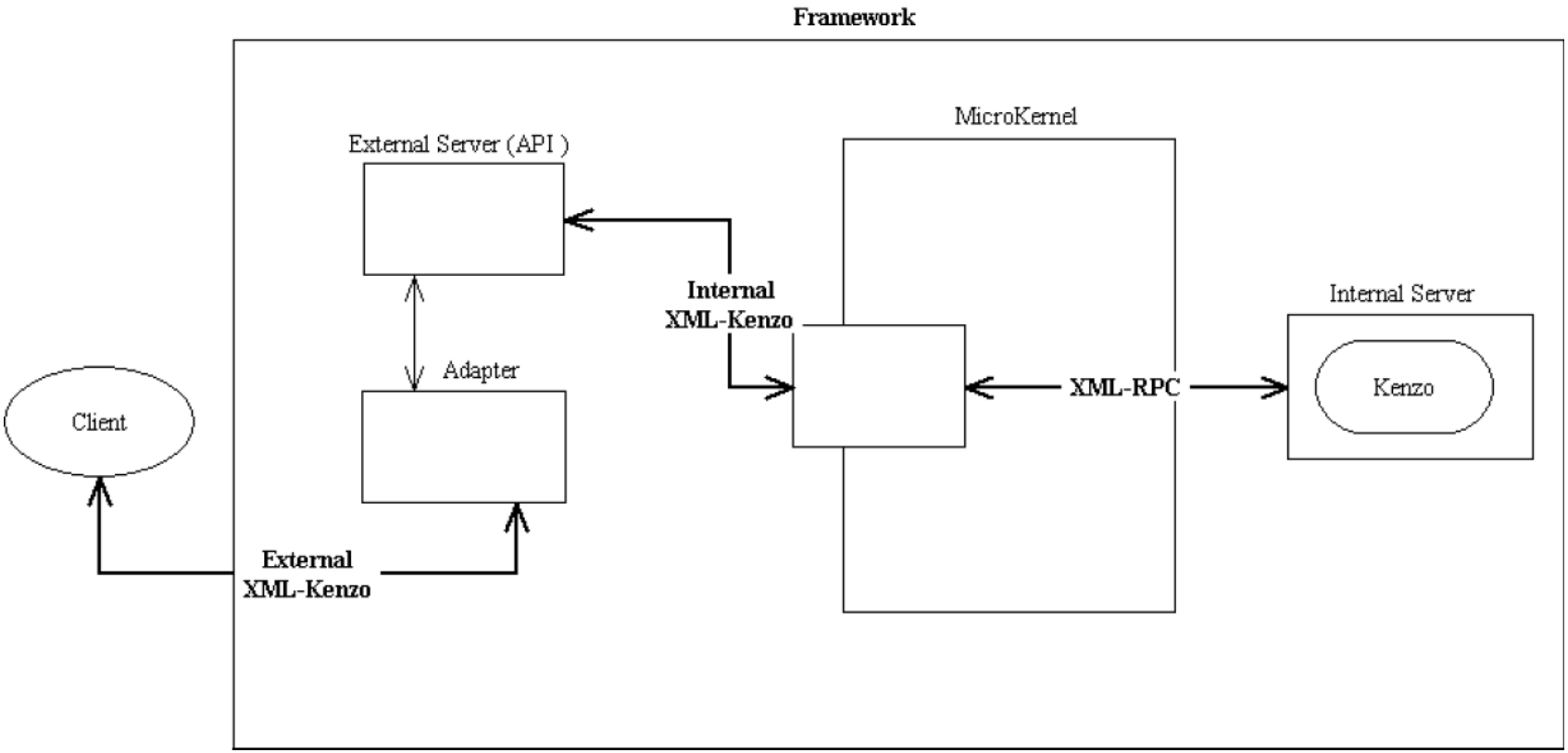

Inspired by the *MicroKernel* architectural pattern

XML

- XML-RPC: is a simple remote procedure call which uses XML to encode its calls.
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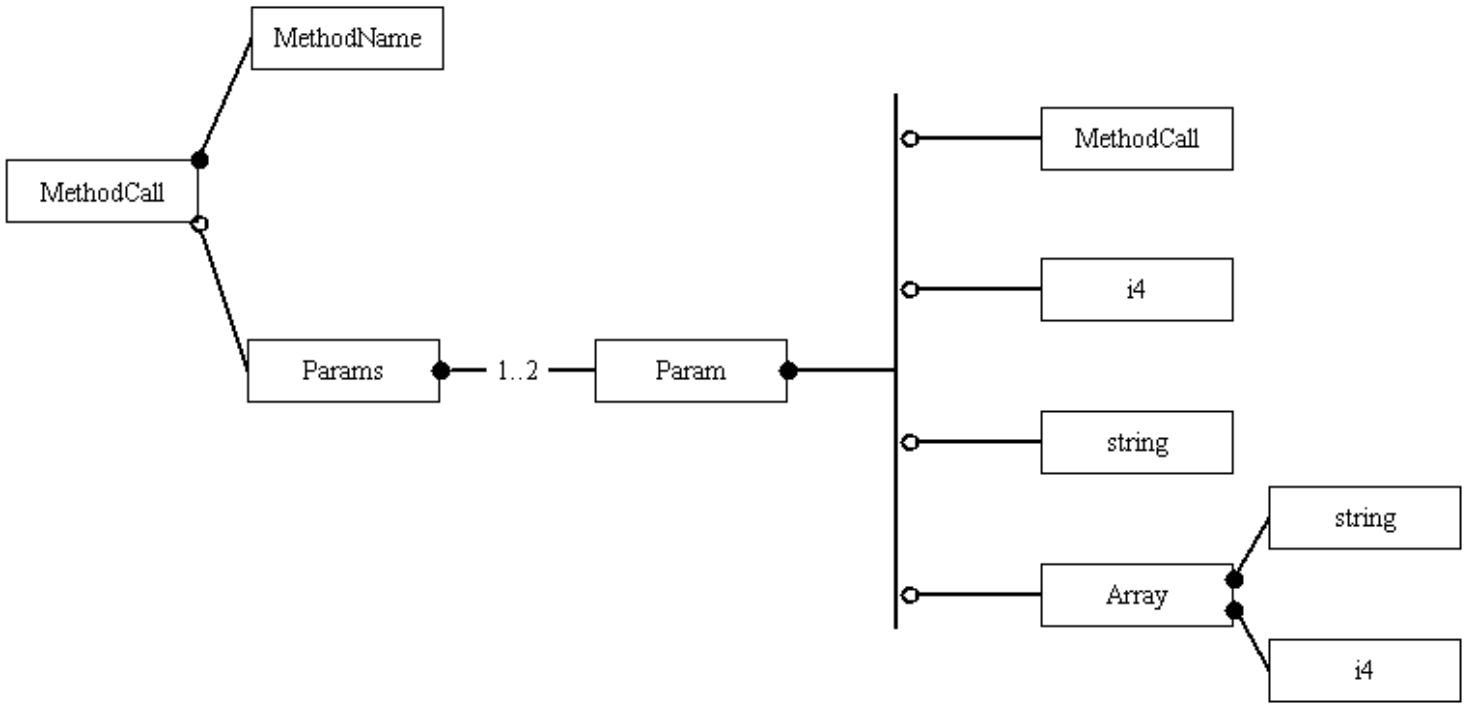

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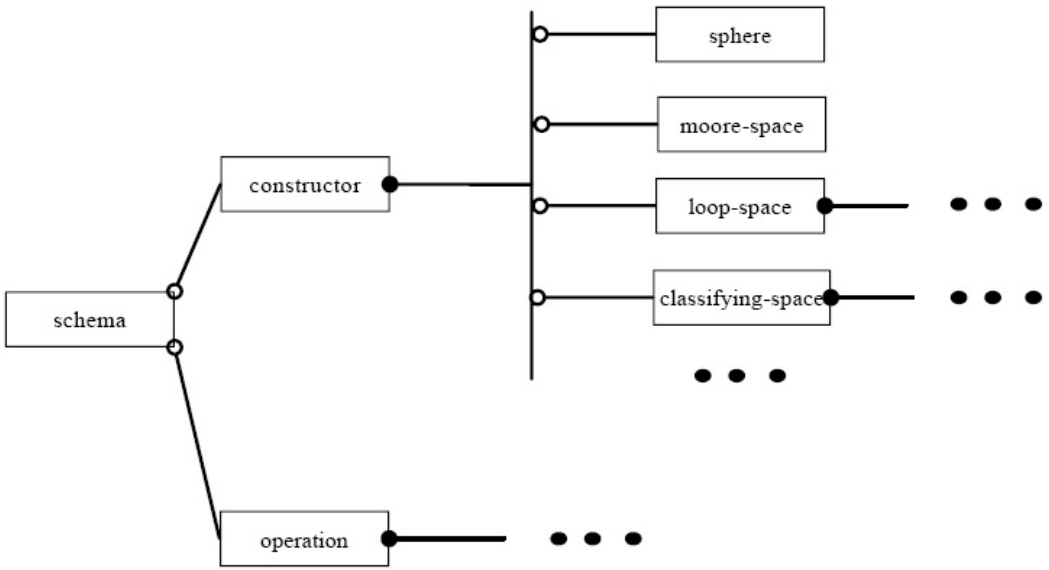

Intelligent Enhancements

The system includes the following "intelligent" enhancements:

1. Controlling the input specifications on constructors.
2. Avoiding some operations on objects which will raise errors.
3. Chaining methods in order to provide the user with new tools.
4. Determining if a calculation can be done in a local computer or should be derived to a remote server.

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This reusing has two aspects:

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Kenzo Interface

Local or Remote?

When a calculation should be derived to a remote server?

Two kinds of state:

- The state of session.
- The state of space.

We should solve problems of distributed system in order to enable our intermediary layer as an intelligent assistant with respect to the classification of calculations.

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Conclusions

We have showed how some intelligent guidance can be achieved in the field of CAT, without using standard Artificial Intelligence techniques.

$$\left.\begin{array}{l}\text{Kenzo}\\ \text{Intermediary Layer}\end{array}\right\} \Rightarrow \text{A Framework}$$

With this framework the interaction with Kenzo is easier and enriched.

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