Proof of Concept of MMT SCSCP Server

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1 Concept

The idea behind an MMT SCSCP server is abstraction of abstract algebra systems from the users in order to make the use of those systems more accessible. In order to prove the possibility of this concept, we are developing a system consisting of the following parts:

- Central MMT SCSCP server that acts as an interface between a user and advanced algebra systems

- GAP SCSCP server that specializes on group theory

- Singular SCSCP server that specializes on polynomial calculations

- Python client that uses the SCSCP package

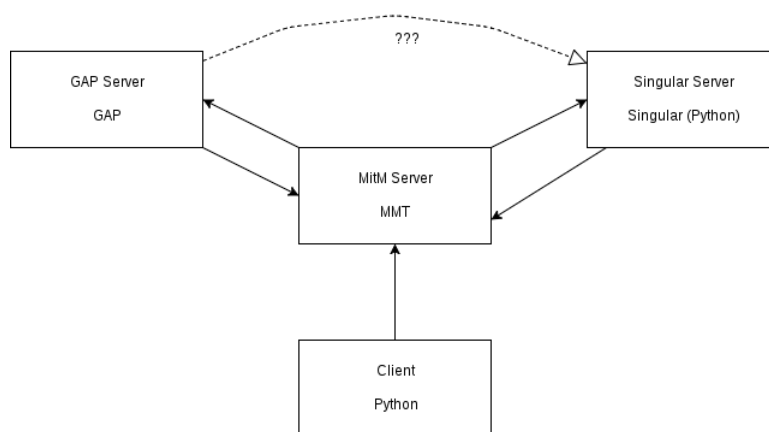*Figure 1: Structure of the Proof of Concept System*

Figure 1 illustrates the structure of the system. The dotted arrow indicates potential interaction between GAP and Singular that bypasses the MMT server for efficiency.

2 Development

2.1 Formalization of Group Theory Concepts

In order to ensure smooth interaction between different algebra systems, the MMT server must have access to formalized concepts represented by them. The first step was thus to formalize the concepts of group theory available in the GAP system in MMT. The resulting code can be seen in MitM/groups repository on Mathhub[1].

2.2 Establishing a GAP Server and a Python Client

To familiarize myself with the Python client API, I ran a GAP server with minimal functionality[2] and queried it using the Python client.

3 References

1. MitM/groups repository

2. Example GAP SCSCP server