

From TPTP to TSTP: Useful additions we'd like to have

Gernot Stenz
Institut für Informatik der Technischen Universität München
Boltzmannstraße 3
D-85748 Garching
Germany

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In recent years, some researchers have set out and actually started using ATP systems in a variety of settings. However, actually using a theorem prover for any purpose other than just testing its soundness and completeness brings up a number of new issues that will have to be dealt with by the prover developers.

The TPTP syntax, although quite ad-hoc, has become a de facto standard for formulating and exchanging logical problems for automated theorem provers. However, the TPTP has also a number of shortcomings that would have to be dealt with in revised version of the language, whatever the name. The TSTP syntax has been developed largely unnoticed by most of the developers. Now that it is here, but not set in stone yet, we hope to influence the new syntax so we can use it to our benefit.

Complexity. At a first glance, it seems the TSTP has set out to make exactly the same mistakes as were made in the times of the DFG syntax. The BNF appears cluttered, writing a parser for the syntax becomes ever more cumbersome. It is full of concepts that want to encompass anything yet are so generic that they can hardly be of use to more than one person at a time.

Sorts. The use of sorted terms has long been discussed and a facility for representing sorted terms should be present.

Numbers. Proof tasks presented to ATP systems in applications usually contain numbers in one way or other, even though mostly in a trivial setting, such as showing that 32767 is less than 32768. As it does not make sense to represent 32768 as a successor term $s(s(s(\dots)))$, the new syntax should allow the use of numbers and limited numerical expressions in a natural way.

Equality. From the point of view of our users, an infix equality symbol “=” would be nice.

Proof output. Different ATP systems employ different calculi using different inference rules requiring different side conditions. Using a uniform proof output notation does not appear to us as the way to go. Proof representation maybe should be left to a higher order syntax.

As the London meeting will be held in a small circle of people, we hope that progress can be made regarding these and other issues.