Abstract

This project is initiated by Ericsson Infotech AB, Department of Test, Support and Simulated Platforms (TSP) in Karlstad. At TSP, simulation of telephone switches is performed. When simulating, gotos are used in the simulation language (C). Newer versions of the C compiler, GCC, do not support the use of gotos between functions. Ericsson needs to develop support for a technique called "tail calls" in order to replace the code using gotos. This project involves investigating the requirements for GCC to support the mechanism for handling tail calls. As a background, the authors will describe in general terms, the function and phases of a compiler, and in particular those of GCC.

We have found some related projects that suffer from the lack of tail call elimination. A person involved in one of these projects has worked together with us trying to solve the common problem.

A single user can make a difference to the development of GCC. This project has awoken the interest for a tail call solution. We assert that such a solution has emerged much earlier due to our actions, than it would have done else.

When a solution was published, our project changed direction from designing a solution to evaluating an already implemented solution.

Ericsson's goal was not achieved one hundred percent. However, this project has brought Ericsson much closer to a solution that would handle a related problem, that of indirect tail calls. While finalizing this report, we conferred with our knowledgeable contacts in order to investigate how much work that remains in order to adjust the existing GCC version, (with the Cygnus/Jelinek patches committed) to solve Ericsson's tail call problem.

The authors recommend Ericsson to use the outcome of this report as a springboard for further investigations and development, if Ericsson intends to develop an in-house solution.

or

to purchase a solution from one of the various companies that supplies GCC support and hence are possible contractors for the remaining work.