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New Language Project Formal Report

CS 3210

Brief History

Erlang grew from the need by Ericcson, a telecommunications equipment manufacturer, for a language best suited to program switches used in telecommunications. Were conducted with 20 different existing languages from 1982 – 1985. Those experiments concluded that the language needed to be symbolic and high level to achieve productivity gains. Further experiments from 1985 – 1986 concluded that the language must contain primitives for concurrency and error recovery, the execution model must not be backtracking, and the granularity of concurrency necessary to represent one asynchronous telephony process by one process in the language. These requirements ruled out Lisp, Prolog, Parlog, and other candidates. The conclusion was that Ericcson must develop its own language ultimately culminating in Erlang. Following this line, the first version was released in 1988 for Ericcson internal use programming Private Automatic Batch Exchanges, a networking hardware component.

From 1989 to 1997 Erlang went from a small project of Joe Armstrong, Robert Virding, and Mike Williams to hundreds of people being involved. Following presentation at a conference in 1989, researchers at Bellcore expressed interest and the first external release was delivered to them by mid-1990. With interest growing, a C emulator, a considerably improved compiler, and the addition of libraries were produced by the end of 1990. Between 1990 and 1993 implementation additions included garbage collection, copying data between processes, records, included files, and macros. The language continued to grow to over 30 sites. In 1993 the first official book was published on Erlang following the decision to commercialize the language. Also in 1993 the addition of the BEAM compiler allowed Erlang to be compiled to C, adding cross-platform use and a large increase in speed at the cost of increased code volume.

The pivotal moment for Erlang came in 1995 when the collapse of a large Ellementel project called AXE-N, a large hardware platform with system software written in C++. When the project was reorganized, Erlang was chosen as the development language, and the project became the first large scales use of the language. This proved the value of Erlang and convinced Ericcson to invest significant resources to support the language.

In 1998, however, Ericcson banned the use of Erlang internally arguing that globally used languages offered more long-term value. Concurrent with this decision Jane Walerud convinced the management team that selling Erlang was not viable given the growing availability of open source alternatives. Management agreed, and the project was released as open-source in 1998. These two events convinced a large portion of the Erlang development team to resign and form their own company. These three events together greatly contributed to growth in Erlang use.

Since the late ‘90s, the growth in multiprocessor architectures has made Erlang an excellent choice for parallel processing. In 2006 the open-source language group released Erlang for symmetric multiprocessing. This was the most significant recent release.

Language Overview

* Variables must start with a capital letter. Variables can only be given a value once.
* Atoms start with a small letter. Atoms are simply names, nothing else.
* Tuples are comma separated list of any valid Erlang term between {…}. Tuples have a fixed number of things (elements) in them.
* Lists are surrounded by […]. Lists have varying sizes unlike tuples.
* Comments from % to end of line.
* Functions with the same name but different argument number are treated as completely separate functions.
* Syntax for guard: function\_name() *guard* -> … For example

list\_max([Head|Rest], Var) when Head > Var -> …

* If conditions: run-time failure if no condition matches

Standard References

* “History of Erlang.” Wikipedia, 12 Mar. 2018, https://www.erlang.org/course/history.
* Joe Armstrong. “A History of Erlang.” Wikipedia, 19 Mar. 2018, http://webcem01.cem.itesm.mx:8005/erlang/cd/downloads/hopl\_erlang.pdf.
* “Erlang (programming language).” Wikipedia, 11 Mar. 2018, https://en.wikipedia.org/wiki/Erlang\_(programming\_language).