RELEASE

Contract number
287510

Project coordinator
Heriot-Watt University

Project website
www.release-project.eu

A HIGH-LEVEL PARADIGM FOR RELIABLE LARGE-SCALABLE SERVER SOFTWARE

Multicores require radically new software development technologies

Key Claim

The project will develop the first ever scalable concurrency-oriented programming infrastructure and its associated tool set, and hence aims to reduce development times of multicore solutions while delivering increased reliability.

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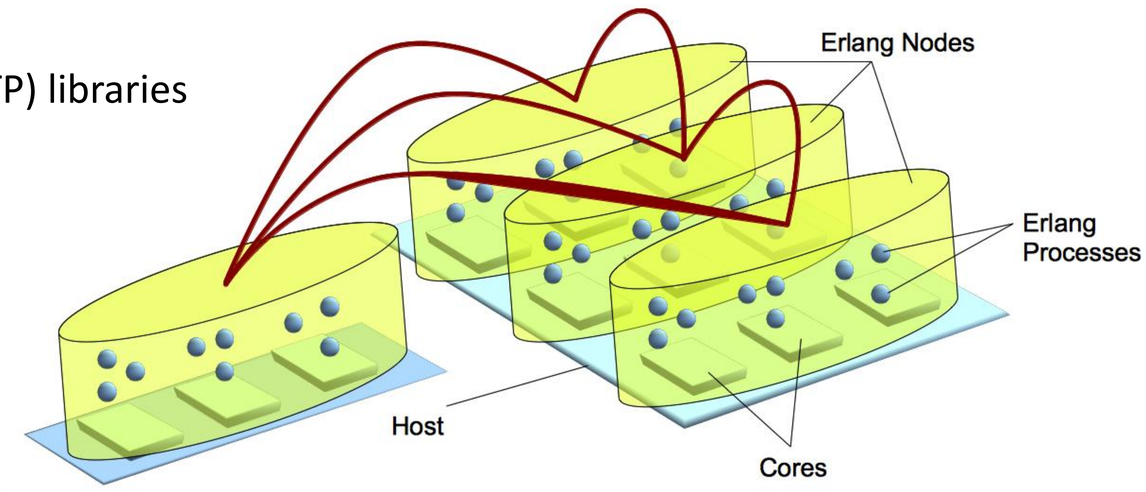
Technical Context

Our platform builds on the Erlang language and Open Telecom Platform (OTP) libraries that have concurrency and robustness designed in.

Currently Erlang/OTP has inherently scalable computation and reliability models, but in practice scalability is constrained:

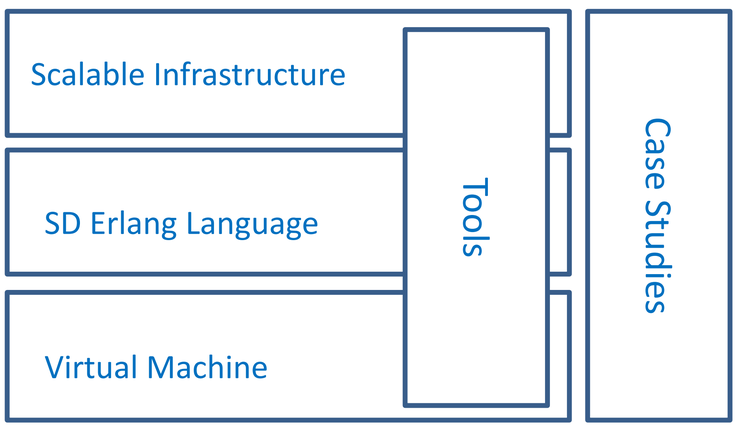
- Transitive sharing of connections between all nodes
- Explicit process placement - makes irregular or dynamic process structures difficult
- Existing profiling/debugging tools do not scale due to the volumes of data.



Conceptual view of Erlang's concurrency

Technical Approach

- Evolve the Erlang virtual machine for large-scale multicore systems
- Evolve the language to Scalable Distributed (SD) Erlang
- Adapt the OTP framework to provide
  - ✓ constructs to control process placement
  - ✓ reusable coordination patterns
- Develop a scalable Erlang infrastructure to integrate multiple heterogeneous clusters
- Design tools to enable programmers to
  - ✓ profile
  - ✓ visualize
  - ✓ refactor
  - ✓ debug SD Erlang systems.



Strategic relationships between the partners

Demonstration and Use

We will demonstrate the effectiveness of the RELEASE approach by case studies

- The Sim-Diasca simulation framework on an IBM Blue Gene
- A heterogeneous cloud-based continuous integration framework service

Key Features

- Improve the programmability of large off-the-shelf architectures by scaling the radical concurrency-oriented programming paradigm
- Facilitate the development of reliable general purpose systems to exploit 10,000 cores or more
- Reduce development times providing state-of-the art tools to profile and control performance on large scale systems
- Provide case studies of highly concurrent simulation on the Blue Gene platform and a heterogeneous cloud-based continuous integration framework.

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