

JAKUB CZARNIECKI

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**ERLANG**



SO...

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**WHAT IS ERLANG?**



ERLANG

# ERLANG IS...

- ▶ Functional programming language
- ▶ General-purpose programming language running on top of BEAM (Erlang virtual machine)
- ▶ Open-source programming language designed at the Ericsson Computer Science Laboratory

# A SHORT ERLANG HISTORY

- ▶ First appeared in 1986
- ▶ C-based Erlang VM created in 1991
- ▶ OTP released in 1996
- ▶ Open-sourced in 1998



# ERICSSON



# WHAT ERLANG HAS TO OFFER

- ▶ Concurrency as a built-in feature of the language and virtual machine
- ▶ Distribution built-in as a feature of the language and ecosystem which allows to create High Availability systems
- ▶ Built-in fault tolerance

# BUT THERE IS MORE!

- ▶ Networking is transparent
- ▶ There is no difference if the process is running locally or on remote node
- ▶ Crashes are not something to completely avoid and defend against

**AVOID DEFENSIVE  
PROGRAMMING**

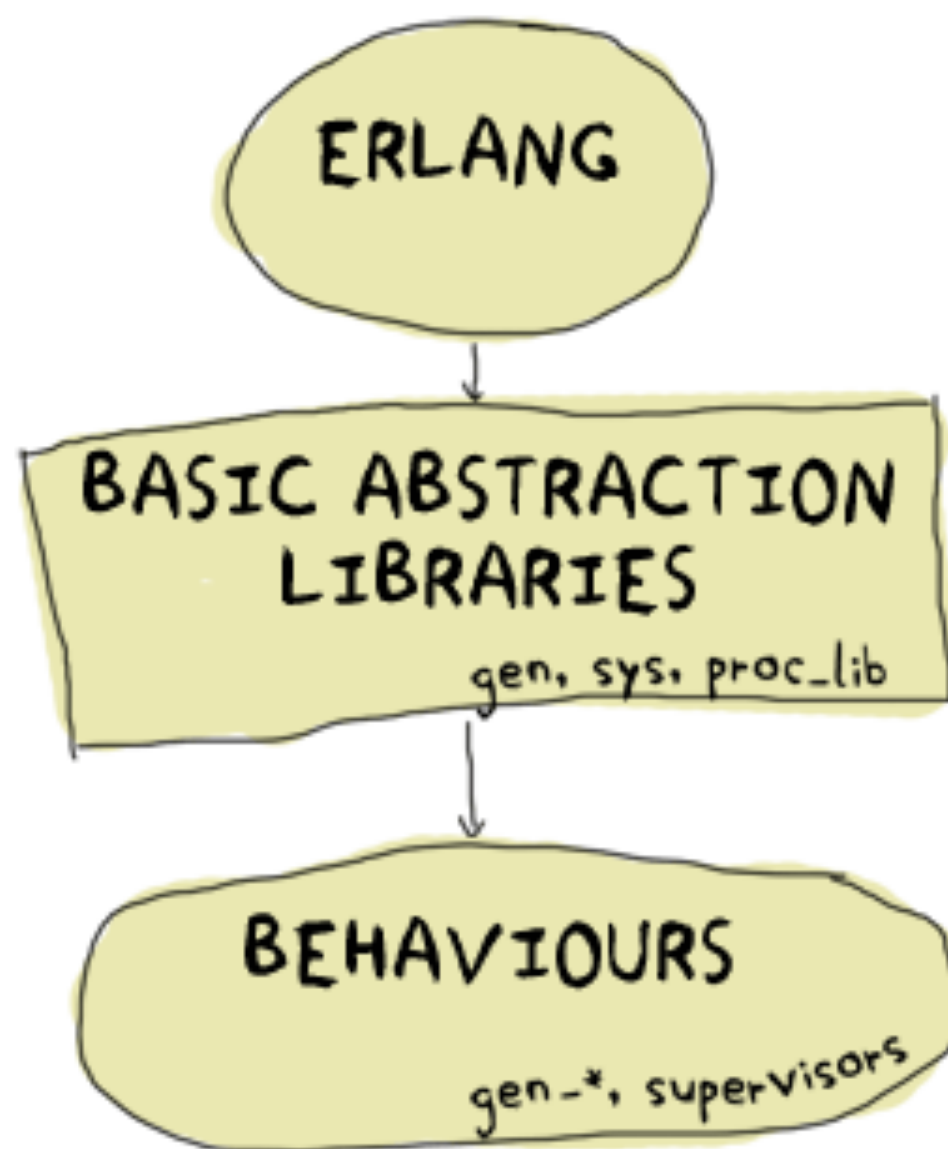




BUT...

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**WHAT IS ERLANG/OTP?**



# ERLANG/OTP IS...

- ▶ Erlang framework
- ▶ Set of basic abstraction libraries
- ▶ Set of generic patterns (behaviours) for processes





BUT WAIT....

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**WHAT IS BEAM?**

# Erlang Processes

(Any number of CPUs)



Garbage collection within ERLANG VM.

# Java Threads

(2 CPUs)



Garbage collection within JVM.

# BEAM IS...

- ▶ Erlang virtual machine
- ▶ Robust and battle-proven virtual machine powering many telecom-grade systems

99.99999999%

SLA



# BEAM HAS TO OFFER

- ▶ Hot-code loading
- ▶ Short, per-process GC pauses
- ▶ Very, very high availability (up to nine nines)  
Example: In 1998 Ericsson announced the AXD301 switch, containing over a million lines of Erlang and reported to achieve a high availability of nine "9"s.

# CONCURRENCY VS PARALLELISM

DEALING WITH LOTS OF THINGS AT  
ONCE

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**CONCURRENCY**

SIMULTANEOUS EXECUTION OF  
(POSSIBLY RELATED) COMPUTATIONS

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**PARALLELISM**

# RECOMMENDED ERLANG LEARNING RESOURCES

- ▶ <http://www.erlang.org/doc/index.html>
- ▶ <http://learnyoussomeerlang.com/content>
- ▶ <http://opensource.erlang-solutions.com/erlang-handbook/>
- ▶ <https://docs.basho.com/riak/latest/dev/taste-of-riak/>

# RECOMMENDED ADVANCED ERLANG LEARNING RESOURCES

- ▶ <http://erldocs.com/>
- ▶ <http://www.erlang-in-anger.com/>
- ▶ <http://ferd.ca/> (BLOG)
- ▶ <http://littleriakbook.com/>

# EXAMPLES OF ERLANG APPLIANCES

- ▶ Riak (NoSQL key-value database)
- ▶ RabbitMQ (AMQP server)
- ▶ ejabberd / MongooseIM (XMPP server)
- ▶ CouchDB (NoSQL document-oriented database)
- ▶ Zotonic (CMS and web framework)
- ▶ Chef (configuration management system)
- ▶ Call of Duty server core (game server)
- ▶ League of Legends chat system (XMPP)



**QUESTIONS?**

**THANK YOU**

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