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Building a Scalable E-commerce Framework



Outlines

- **Introduction**
- Why ...
- Cookie Cart
- Thoughts on Erlang
- Q&A

- Introduction
- Previous Experience
- What is an
“e-commerce framework”?

Introduction

- University of Uppsala in Sweden.
- Project course in computer science
 - 9 students
 - Different countries and cultures
 - Working with a industrial partner, in our case:



UPPSALA
UNIVERSITET



Previous experience - Erlang

One week crash course courtesy of



Erlang Solutions Ltd.

— *formerly Erlang Training and Consulting Ltd.* —

Previous experience – Project management

- Typical university project
 - Four students
 - 3-4 weeks
- Scrum
 - Iterative process
 - One week course courtesy of **C I T E R U S**

What is an “e-commerce framework”?

- A reusable web shop
- All-in-one solution
 - Well designed website for shoppers
 - Administration web interface for shop employees
 - Built-in databases for goods, stock, orders, ...
 - Content management (text, pictures, ...)
 - Payment systems
 - Ready to use in very short time

Demo

Outlines

- Introduction
 - **Why ...**
 - Cookie Cart
 - Thoughts on Erlang
 - Q&A
- Another e-commerce framework
 - Using Erlang is a good idea
 - Nitrogen
 - Distributable
 - Riak

Why another e-commerce framework?

- All code written in Erlang
- Highly Customizable without an IT degree
- Distributable
- Scalable
- Fault-tolerant

Why using Erlang is a good idea

- Hot code upgrade
 - Live upgrades
 - Plugins
- Fault-tolerant
 - Minimum downtime
 - Downtime = lost revenue
- Easy communication between Erlang nodes

Why Nitrogen

- Web 2.0 toolbox written in Erlang
 - Event driven
 - Easy Ajax
 - Push data to browser using comet
- Webserver integration
 - Inets, Mochiweb and Yaws

Why distributable

- Reliability
 - Add a machine and gain reliability
- Scalability almost for free!
 - Add a machine and gain capacity

Why Riak

- Because they told us to...
- Fits the problem: Dynamic scalability
- Brand new (0.4)
- Key/value store, not a “database”.
 - We can store what we want, how we want.
- Distributed, not replication based.
 - Easily scalable

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 - Why ...
 - **Cookie Cart**
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 - Q&A
- Easily customizable
 - Multiple currencies
 - Scales with hardware

 - Synchronization
 - Future work
 - Obstacles
 - Things learnt

Customization - Templates

- Mostly simple HTML
- ErlyDTL for some extra power
 - Django
 - System tags
- Inbuilt editor
 - Quick fixes
 - Updates all webservers

Customization - Plugins

“Something like what mobile apps are today”

- Can do almost anything
- Easy to add
- Easy to remove

- Can break stuff

Languages

- Translation editor

Add new sentence

English

Swedish

Add to translation file

Edit translations

Select language

Swedish

Save translations

"General settings"
"Allmäna inställningar"
"Contact information"
"Kontaktinformation"
"Currency settings"
"Valutainställningar"
|
"Store name"
"Butikens namn"
"Company name"
"Företagets namn"
"Customer default page"
"Standardsida för kunder"
"Admin default language"
"Standardspråk för admin"

Currencies

- Fixed-point number
 - $0.12 * 100 = 12$
 - Exchange rate
 - Scale factor
 - Fixed-point
- One Base Currency
 - Others currencies are calculated
 - $GBP = SEK * \text{exchange rate}$
- Prices handled in the same way

Scalability

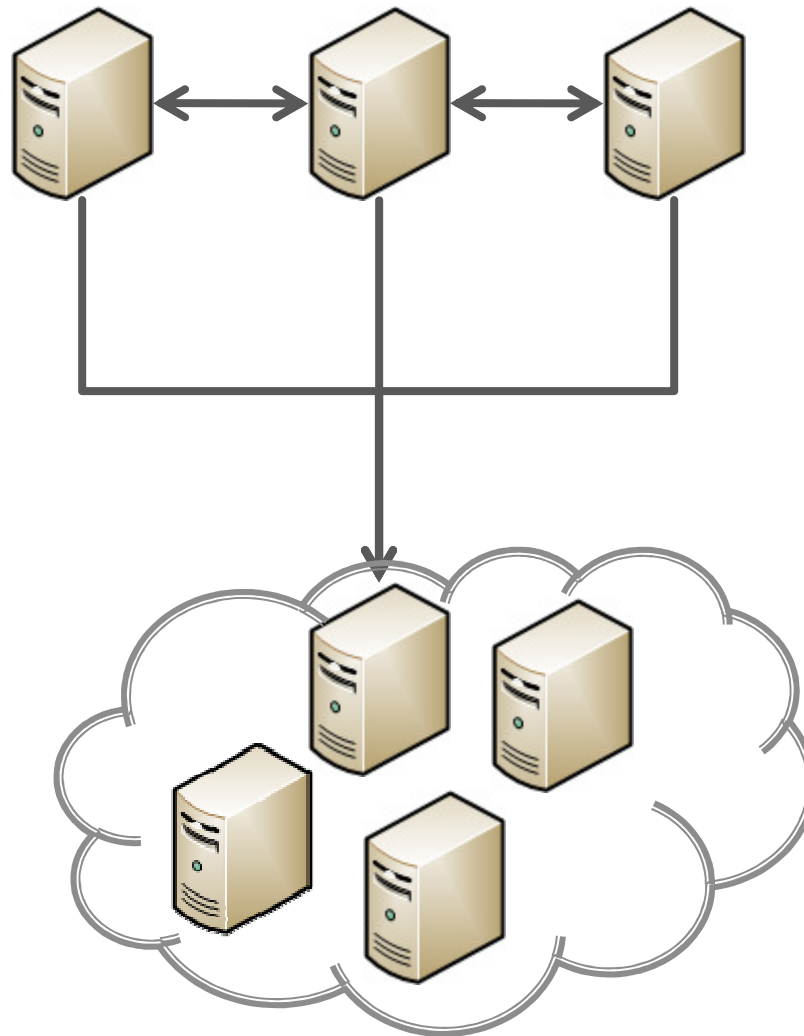
- Web servers
 - Install Cookie Cart package
 - Point to Riak cluster
- Riak
 - Install Cookie Cart Riak package
 - Expanding the cluster is handled by Riak

Synchronization

- A way to keep web servers synchronized
- 'Nsync'
- Broadcasts 'new revision' message
 - Nodes fetches new data
 - Pass-it-forward (extreme redundancy)

Scalability

Web server
Risk



Future work

- Integration of different databases
 - mySql, couchDB ...
- Automatic restock message
- Product recommendations
- Heavy load testing of the system

Obstacles

- Group communication
- Riak
 - New versions
 - New way to design data storage
- Poor documentation
 - From the tools we used
 - But also from us...
- Automated test cases for webpages

Things learnt

- Erlang
- Work in a large project group
- Designing a e-commerce framework
- Working with key-value stores

- Small changes effects more than you think

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- Introduction
 - Why ...
 - Cookie Cart
 - **Thoughts on Erlang**
 - Q&A
- General impressions
 - a lot like Erlang...


Thoughts on Erlang

- Learning curve
- Good API documentation
- Readable code
- Community

Thoughts on Erlang

“Coding on paper has many advantages. No obscure compilation errors, paper is platform independent, you can explain what you want in a few words instead of a few hundred instructions... It’s a lot like Erlang actually.”

Thank you!

- Rusty Klophaus (Basho)
- Richard Carlsson  **klarna**

Cookie Cart 2.0 available on GitHub!

Questions?

