

# ZOTONIC

*Simple stuff that works*

A modern web framework and CMS

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# Overview

- Yet another CMS?
- Why Erlang?
- Inside Zotonic
- The future

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# Websites: a history

- First generation
  - static text, images
- Second generation
  - Database driven, templates, CMS.
- Now:
  - Highly interactive, realtime, data exchange, personalization

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# Our wish list

- CMS
- Framework
- Connectivity
- Frontender friendly
- Efficient use of hardware

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# Now: <?php ?>

- Slow
  - More code => slower
- Shared nothing
  - Amnesia doesn't make it faster
- Big non threaded web server
  - Forget long living connections...

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# Now: Python, Ruby...

- One process per core
- Multithreading? Better not
- No sharing of state and data
- Memcache is common state
- On failure your server crashes

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# Erlang?

- Website is communication hub
- Many kinds of data streams
- Many Parallel connections
- Lots of short requests
- Long living connections
- ...this looks like a phone switch!

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# Why not Erlang?

- Esoteric language
  - Greater error/failure handling
  - Very compact
  - Mature
- String processing?
  - Data preprocessing, `iolist()`s

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# Demo time!

**ZOTONIC** visit site »

- Dashboard
- Pages
- Media**
- Users
- Comments
- Menu
- Categories
- Predicates
- Backups
- SEO
- Modules
- Config
- API access
- Log
- System
- Log Off

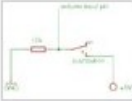





## Media

[make a new media item](#)

Media encompasses all uploaded images, movies and documents. Media can be attached to pages.

« previous [1](#) [2](#) [3](#) [4](#) [5](#) ... [5](#) next »

### Media overview

Preview	Title	Type	Filename	Dimensions	Uploaded	Actions
	Very Complicated Schematic :-)	image/png	2011/8/4/schematic.png	592 x 429	Aug 04, 11:57	<a href="#">delete</a> <a href="#">edit</a>
	Arcade-strength buttons	image/jpeg	2011/8/4/img_20110804_114425.jpg	1152 x 864	Aug 04, 11:56	<a href="#">delete</a> <a href="#">edit</a>
	Arduino with joystick	image/jpeg	2011/8/4/img_20110804_114405.jpg	1152 x 864	Aug 04, 11:55	<a href="#">delete</a> <a href="#">edit</a>
	MiracleThings - Card front	application/pdf	2011/7/9/card_front.pdf	255 x 153	Jul 09, 11:42	<a href="#">delete</a> <a href="#">edit</a>
	Blowup of website detail	image/png	2011/7/9/site.png	900 x 589	Jul 09, 09:06	<a href="#">delete</a> <a href="#">edit</a>
	lkPod parts	image/jpeg	2011/7/5/15549_1500_917.jpg	1500 x 917	Jul 05, 00:58	<a href="#">delete</a> <a href="#">edit</a>

# So, what's in the box?

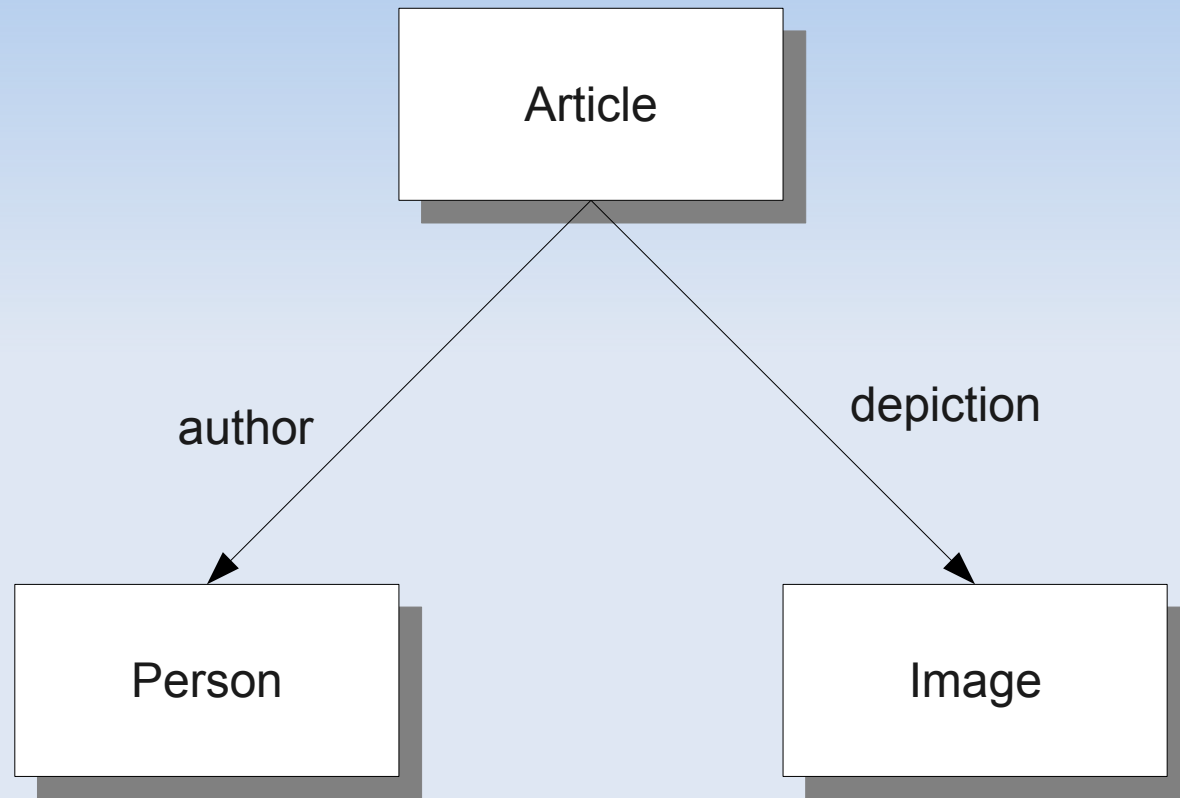
- Multiple sites
- Admin interface
- Member administration
- Page management
- Menu creator
- Commenting
- Image scaling / preview
- Video embedding
- Integrated e-mail sending + receiving (!)
- API OAuth
- i18n
- Atom feeds
- Import CSV / Wordpress
- Mailinglist

# Getting technical

- Where we started
- Our data model
- Open source puzzle
- OTP hierarchy
- Modules
- URL dispatching
- The building blocks

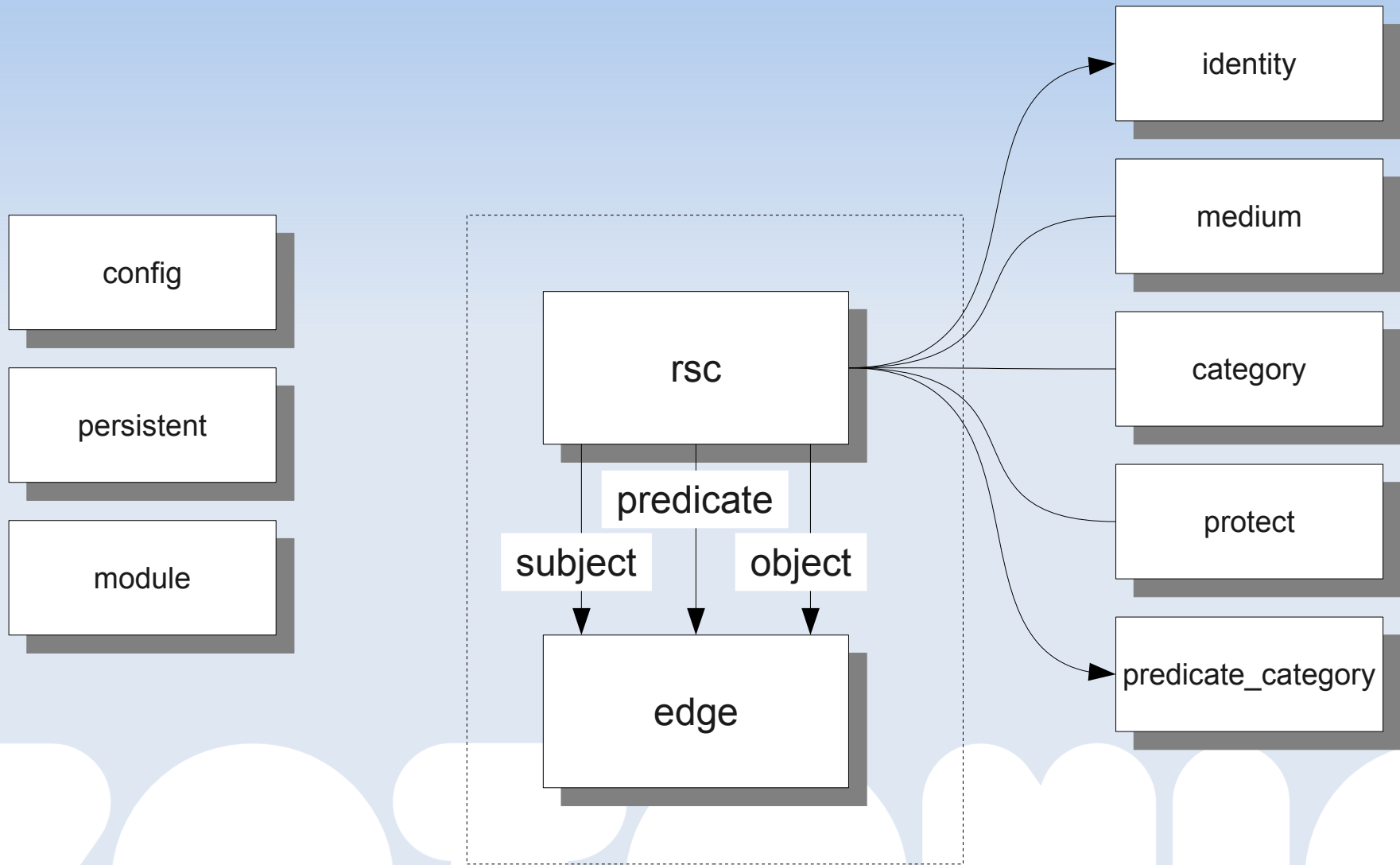
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# Data model: *everything is a thing*



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# Full data model

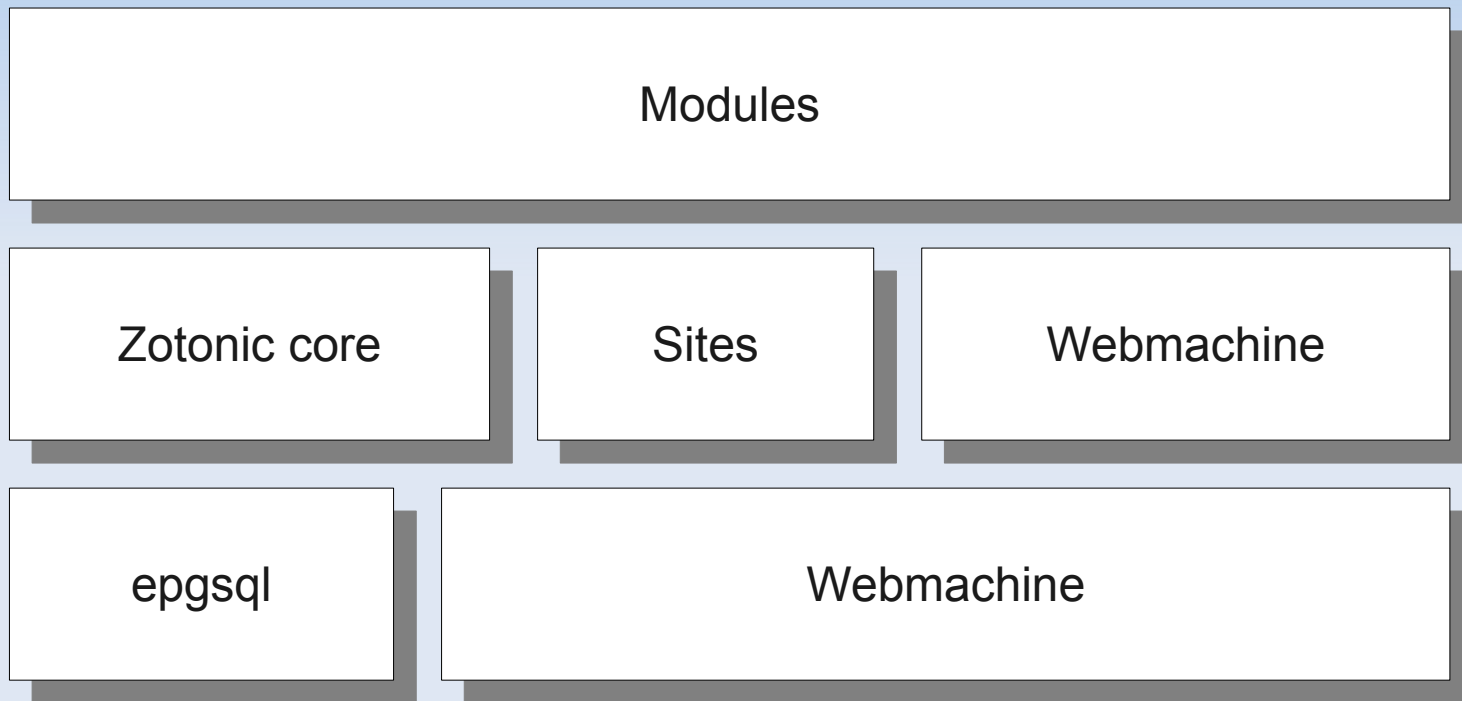


# Open source puzzle

- Webmachine
  - Forked to webzmachine
- Nitrogen
- ErlyDTL
- Mochiweb, erlang-gettext, erlang-oauth, gen\_smtp
- PostgreSQL driver: epgsq
- Imagemagick (cli)

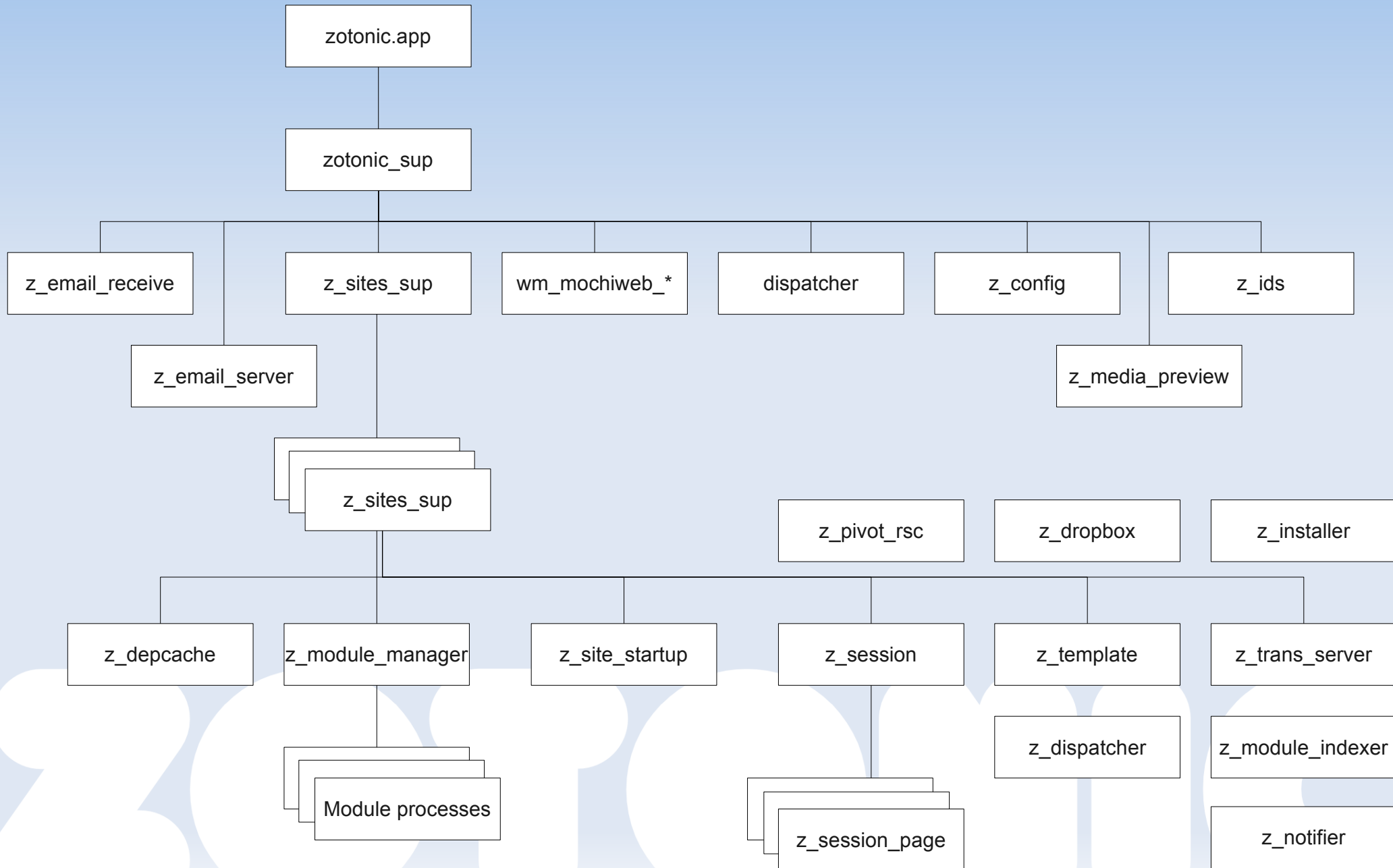
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# Diagram



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# OTP hierarchy





# Modules

- Modules are self-contained:
  - Dispatch rules, resources, templates, css, javascript, images, translations, template filters, actions, validators, API services, models, ...
- Prioritized list
- File lookup mechanism
- Every module can be a gen\_server

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# Notification system

- Is how modules extend and offer functionality
- gen\_event-like
- Listen to notifications
- Send notifications:
  - notify, notify1, fold, map, first
  - Both sync and async

```
% @doc Check if the recipient is a known user, if so redirect the received e-mail
observe_email_received(#email_received{localpart=Recipient} = Received,
Context) ->
  case m_identity:lookup_by_username(Recipient, Context) of
  undefined ->
    undefined;
  Props ->
    case proplists:get_value(is_verified, Props) of
    true ->
```

# URL dispatching

- Dispatch rules per site
  - (and per module)
- Dispatch rules have names

```
{contact, ["contact"], resource_template, [ {template,  
"contact.tpl"} ]},
```

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# The page controller

- Webmachine entrypoint for pages
- 404 check
- Authorization check + logon redirect
- Template selection

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# Template system

- Extended ErlyDTL
  - Expressions: `{% if a + b > c %}`
  - Tuple and list data types
  - Data access through *models*: `{{ m.rsc[id].title }}`
- Templates can be made more specific by category and/or unique page name
- Templates with the same name override each other
  - Uses module priority

# Template ex.: page.page\_projects.tpl

```
{% extends "page.tpl" %}

{% block content_body %}
{% cache 7200 %}

{% for r in m.search[{archive_year cat='project'}] %}
  <div class="grid_9 alpha omega">
    <h2 class="year">{{ r.year }}</h2>
  </div>

  {% for group in m.search[{query publication_year=r.year|append:""
                           cat='project'
                           sort="-publication_start"}]|chunk:3 %}

    <div class="grid_9 alpha omega">

      {% for id in group %}
      {% catinclude "inc/listitem.tpl" id alpha=forloop.first
omega=forloop.last%}
      {% endfor %}

    </div>
  {% endfor %}

{% endfor %}

{% endcache %}
{% endblock %}
```

# Scomps — screen components

- For when you need more logic than a template can handle
- Erlang module
- Cacheable
- Example: `{% menu id=id %}`

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# Javascript — Event handling

- Ajax postbacks
- Form submits
- Calls event/2 function
- Communicates back to browser by sending javascript
  - Inspired by Nitrogen

```
{% button postback={click foo="bar"} text="click me" %}
```

```
event({postback, {click, Args}, _Trigger, _Target}, Context) ->  
z_render:wire({alert, [{text,"hello"}]}, Context).
```



# Javascript — Push connections

- Uses either Comet or WebSockets
- Attaches to the page process
- Transports Javascript to the UA

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# API services

- API method is an Erlang module
- /api/mymodule/mymethod
- In /services module directory
- JSON input / output
- Process GET and POST

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# Performance optimizations

- Caching (don't hit the database)
- Prevent data copying
- Memo-caching in process dict
- Pre-computed HTML
- Share computations between requests

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# Compute less

- Parallel requests have similar computations
- Only one time calculated
- Lightweight and simple optimization against /. effect
- Uses memo functionality of depcache
- Kind of caching, with 0 expire.

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# Future directions

- Information exchange hub
  - PubSub (XMPP, pubsubhubub)
  - Push & pull (feeds, atom, email)
- Scaling up.... Elastic Zotonic
  - Distributed
  - Fault tolerant
  - Buzzword compliancy :-)

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# Elastic Zotonic goals

- Scalable
- Robust
- Fault tolerant
- Low maintainance
- Easy to setup
- KISS
- Time scale: first release Q4 2011

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# The community

- [www.zotonic.com](http://www.zotonic.com) — always improving with latest documentation
- Great mailing list with helpful people
  - [zotonic-users@groups.google.com](mailto:zotonic-users@groups.google.com)
- XMPP chat room
  - [zotonic@conference.zotonic.com](mailto:zotonic@conference.zotonic.com)

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# Thank you!

- Online resources:
  - MiracleThings website  
[http://miraclethings.nl/media/attachment/2011/8/13/arjan\\_miraclethings\\_789d763.zip](http://miraclethings.nl/media/attachment/2011/8/13/arjan_miraclethings_789d763.zip)  
Presentation slides  
[http://miraclethings.nl/media/attachment/2011/8/13/20110813\\_erlangcamp.pdf](http://miraclethings.nl/media/attachment/2011/8/13/20110813_erlangcamp.pdf)
- ... any questions?

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