

ErlyWeb

A web development framework for Erlang

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Benefits

- Erlang/OTP
 - Industrial-strength platform built by Ericsson (“better than 5 nines”)
- Functional programming
- Concurrent programming
- MVC
- Component-oriented
- Database abstraction (ErlyDB)
- Protection from SQL injection attacks
- Hot code swapping
- Best platform for Comet applications
- Lots of fun!

ErlyDB: Database Abstraction

DDL:

```
CREATE TABLE painting (  
  id integer auto_increment primary key,  
  title varchar(255))
```

painting.erl:

```
-module(painting).  
-compile(export_all).
```

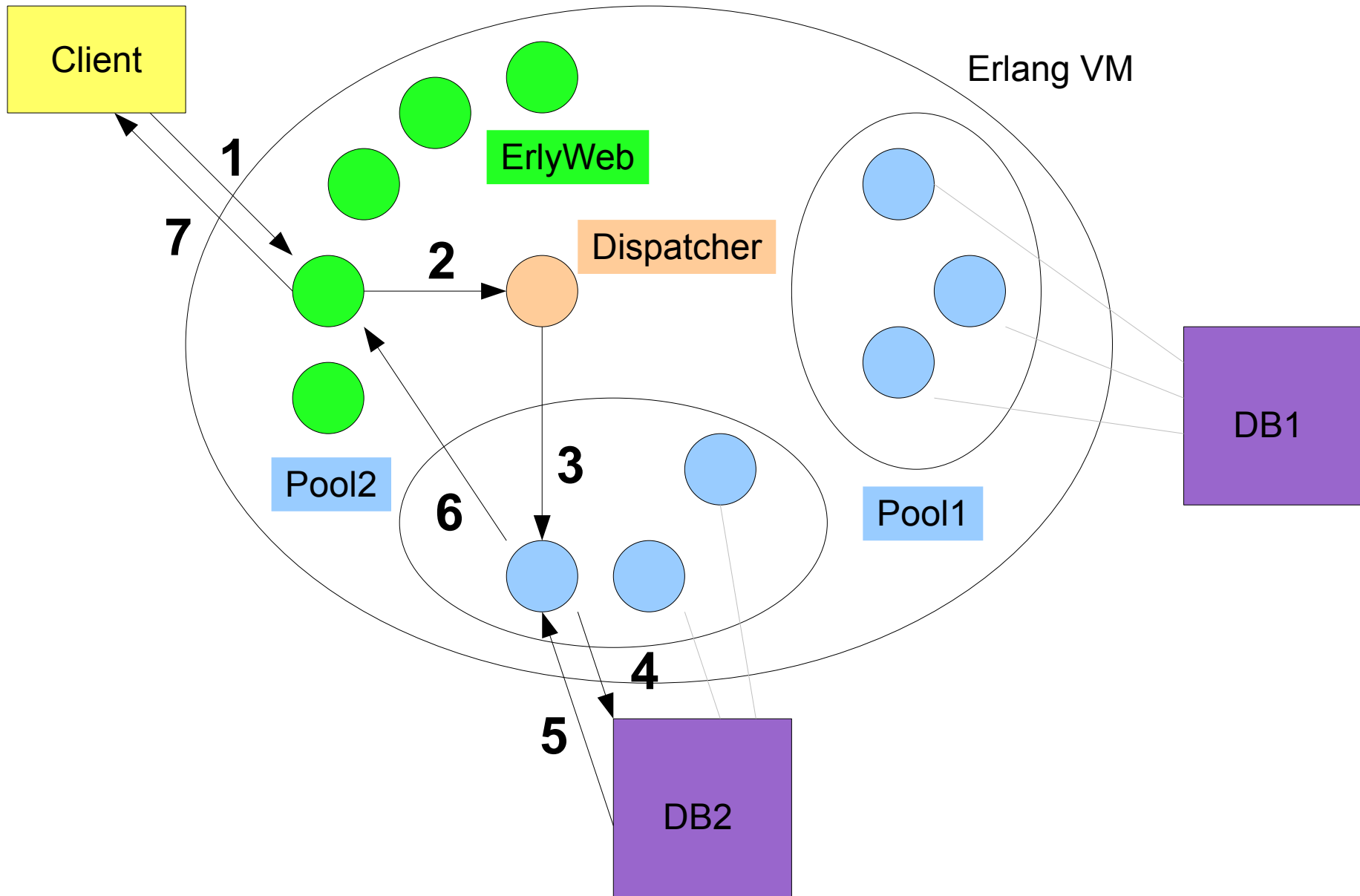
DB Access Code Example

```
Title = "landscape",  
P = painting:new(Title), %% create a new record  
painting:transaction(  
  fun() ->  
    P1 = painting:save(P), %% INSERT  
    P2 = painting:title(P1, "beach"), %% change the title  
    painting:save(P2), %% UPDATE  
    %% SELECT  
    Paintings = painting:find({'or', [{id, '=', 1}, {title, like, "monster%"}]}),  
    painting:delete(P) %% DELETE  
end)
```

More ErlyDB Features

- Relations (many-to-one, one-to-many, many-to-many)
 - `artist:add_painting(Artist, Painting)`.
 - `artist:paintings(Artist, {title, '=', 'beach'})`.
- Drivers for MySQL, Postgres and Mnesia
- Supports multiple DB's
- DB connection pooling
 - Uses Erlang concurrency
 - Dispatcher process + one process per connection
 - Transactions “Just Work”

DB Connection Pooling (MySQL)



Uses for Concurrency in Webapps

- Connection pooling (with transactions)
- Parallelizing DB queries, component renderings, web service calls, etc. (faster page loads!)
- Performing background tasks
 - Updating counters, processing data/assets, communicating with backend services, etc.
- Storing shared (session) data in memory for fast access
- Comet

Components

- Component = Controller + View
- Components can be embedded in other components
 - Controllers decide what to embed, views decide where
- Phased rendering
 - First, render requested component
 - Pass the result (if any) to the enclosing component

Controller Example

```
-module(artist_controller).
```

```
-export([show/2]).
```

```
show(A, Id) ->
```

```
%% look up the artist and related paintings
```

```
Artist = artist:find_id(Id),
```

```
Paintings = artist:paintings_with(Artist, [{order_by, {created_on, desc}}, {limit, 10}],
```

```
%% pass the artist name and a list of rendered 'painting' subcomponents
```

```
%% to the view function
```

```
[{data, artist:name(Artist)},
```

```
{ewc, painting, [A, Painting]} || Painting <- Paintings]].
```

Views

- Views are Erlang modules (benefits: speed, reusability)
- Each controller has a view
- View function names map to controller function names
- View functions return iolists (nested lists of strings and/or binaries)
 - [“what”, [\$a, <<“great”>>, [<<“painting”>>]]]
- Can be implemented in Erlang or ErI TL
- More template languages can be plugged in.

ErITL Example

```
<%@ index({ok, {Username, Painting}}) %>
```

```
Hi <% Username %>!<br/>
```

```
Here's today's top painting: <% Painting %>
```

```
<%@ index({error, Msgs}) %>
```

```
Oops, the following errors occurred:
```

```
<% [err(Msg) || Msg <- Msgs] %>
```

```
<%@ err(Msg) %><div class="error"><% Msg %></div>
```

Components Are Composable

The screenshot shows a web browser window titled "Vimagi | home" with the URL "http://vimagi.com/". The page features the Vimagi logo and navigation links: [gallery](#), [tags](#), [people](#), [my page](#), [feed](#), and [inbox](#). The user is logged in as "Yariv" with links for [my account](#) and [logout](#).

On the left, there is an "online friends" widget showing "you're offline" and a toggle for "I'm offline".

The main content area includes a "Welcome to Vimagi!" message and a prompt to "Feel inspired? [Create a painting.](#)". A sidebar on the right offers a [quick tour](#) for new users and a link to the [gallery](#) for inspiration.

The "latest paintings" section displays two items:

- pirates on the ocean**: A painting of a sailboat on a blue sea under a yellow sun. Metadata: tags: none, 2 days ago, 6 views | 0 comments, 0 votes. Author: [zak](#).
- desert island**: A painting of a palm tree on a desert island. Metadata: tags: none, 3 days ago, 9 views | 1 comments, 0 votes.

Red boxes highlight the following components: the navigation menu, the online friends widget, the welcome message and sidebar, the "latest paintings" header, and the individual painting entries.

Components Are Reusable

The screenshot shows a web browser window with the address bar displaying `http://vimagi.com/gallery/top_rated`. The page title is "Vimagi | gallery | top rated". The browser's search bar contains "Google".

The website header includes the "Vimagi" logo and navigation links: [gallery](#), [tags](#), [people](#), [my page](#), [feed](#), and [inbox](#). The user is logged in as "Yariv" with links for [my account](#) and [logout](#).

On the left, there is an "online friends" section showing "you're offline" and a button to "I'm offline".

The main content area is titled "paintings" and includes sub-navigation for "top rated", "most popular", and "most rated". Below this, it says "paintings 1 to 21".

The gallery displays six artworks in a grid:

- sunset** by [echiu](#)
tags: [beach](#) [sunset](#)
★★★★★ (6 votes)
222 views | 5 comments
- Lola** by [Yariv](#)
tags: [dog](#) [field](#) [sky](#) [grass](#) [white](#)
★★★★★ (4 votes)
95 views | 4 comments
- horror flicks** by [rivka](#)
tags: [late night](#) [tv](#)
★★★★★ (2 votes)
1934 views | 2 comments
- redhead** by [rivka](#)
tags: [woman](#) [red hair](#)
★★★★★ (2 votes)
68 views | 1 comments
- Orb** by [rivka](#)
tags: none
★★★★★ (2 votes)
50 views | 1 comments
- The Distant Shore is Greener** by [msandin](#)
tags: [beach](#) [water](#) [pretentious](#)
★★★★★ (1 vote)
63 views | 3 comments

Components Are Reusable (continued)

The screenshot shows a web browser window displaying a Facebook gallery page for 'Vimagi'. The browser's address bar shows the URL 'http://apps.facebook.com/vimagi-paint/gallery'. The page features a navigation bar with 'Profile', 'Friends', 'Networks', and 'Inbox (2)'. A search bar and a list of applications (Photos, Groups, Events, Marketplace, Superlatives, Pandora) are visible on the left. The main content area is titled 'Vimagi' and includes a 'Feel inspired? Create a painting' button. Below this, there are tabs for 'latest', 'gallery', and 'tags'. The gallery is sorted by 'top rated' and displays six paintings in a grid. Each painting has a title, author, tags, and a star rating. The paintings are: 'sunset' by echiu (5 stars, 157 views), 'My Dog Lola' by Yariv (4 stars, 69 views), 'redhead' by rivka (2 stars, 52 views), 'The Distant Shore is Greener' by msandin (1 star, 44 views), 'horror flicks' by rivka (1 star, 1184 views), and 'Orb' by rivka (2 stars, 36 views). The page footer includes 'Page built by Vimagi' and links for 'Advertisers', 'Businesses', 'Developers', 'About Facebook', 'Terms', 'Privacy', and 'Help'. The browser's status bar at the bottom shows 'Done' and 'YSlow'.

Facebook | Vimagi | gallery | top rated

http://apps.facebook.com/vimagi-paint/gallery

facebook Profile edit Friends Networks Inbox (2) home account privacy logout

Search

Applications edit

- Photos
- Groups
- Events
- Marketplace
- Superlatives
- Pandora
- more

Vimagi Feel inspired? Create a painting

latest gallery tags

top rated most popular most rated

paintings 1 to 6

sunset
by echiu
tags: [beach](#) [sunset](#)
★★★★★ (5 votes)
157 views | 5 comments

My Dog Lola
by Yariv
tags: [dog](#) [field](#) [sky](#) [grass](#) [white](#)
★★★★★ (4 votes)
69 views | 4 comments

redhead
by rivka
tags: [woman](#) [red](#) [hair](#)
★★★★★ (2 votes)
52 views | 1 comments

The Distant Shore is Greener
by msandin
tags: [beach](#) [water](#) [pretentious](#)
★★★★★ (1 vote)
44 views | 2 comments
page 1 next >

horror flicks
by rivka
tags: [late](#) [night](#) [tv](#)
★★★★★ (1 vote)
1184 views | 1 comments

Orb
by rivka
tags: none
★★★★★ (2 votes)
36 views | 1 comments

Page built by Vimagi Advertisers Businesses Developers About Facebook Terms Privacy Help

Done YSlow

Phased Rendering Example

hook(A) ->

```
{phased,
```

```
{ewc, A}, %% first, render the requested component
```

```
fun({ewc, Controller, _View, _Func, _Params}, Data, _PhasedVars) ->
```

```
  case Controller of
```

```
    ajax_controller ->
```

```
      %% if the client requested the 'ajax' component, return rendered result unchanged
```

```
      {data, Data};
```

```
    _ ->
```

```
      %% otherwise, embed the result in html_container before returning
```

```
      {ewc, html_container, [A, {data, Data}]}
```

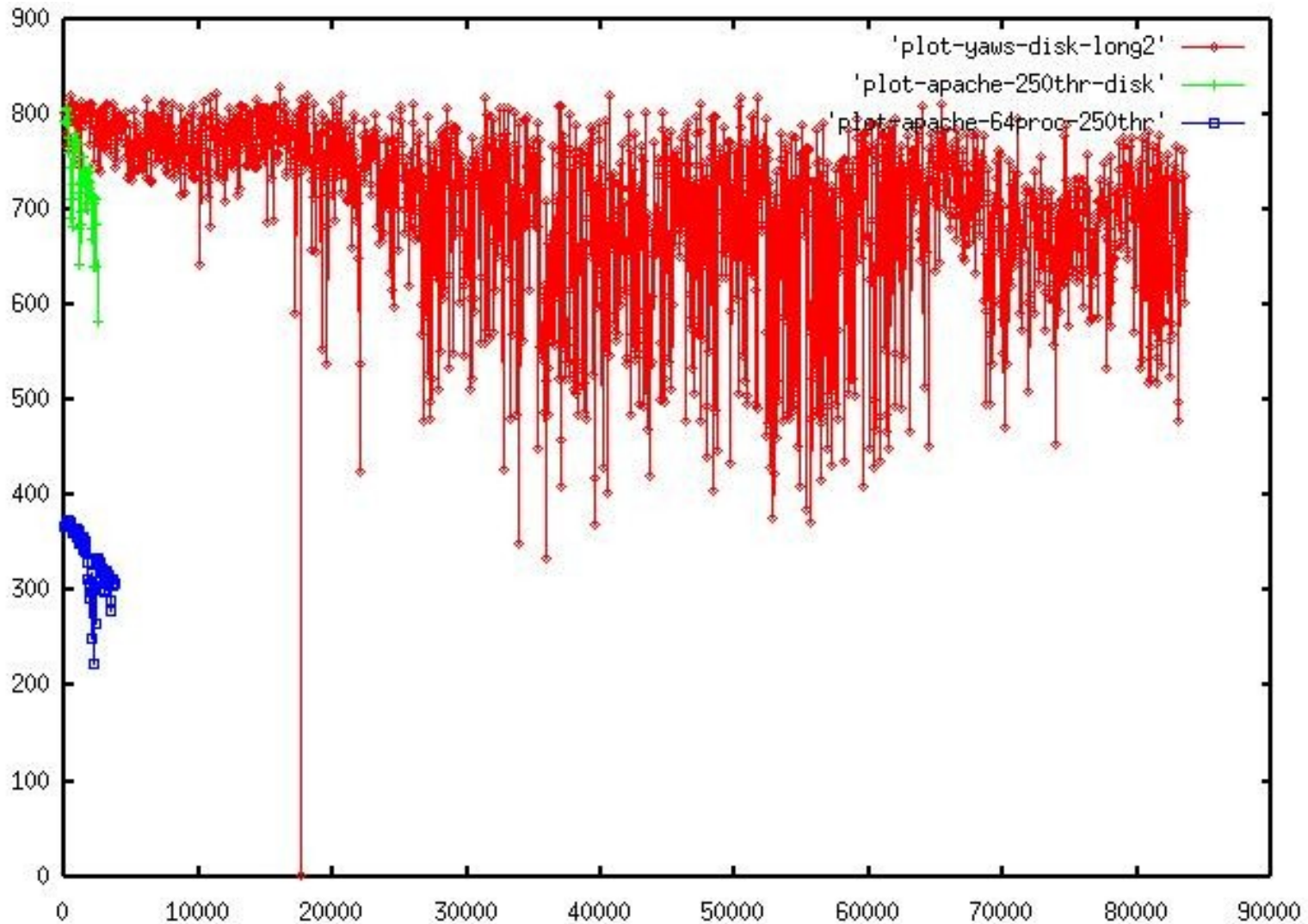
```
  end
```

```
end}
```

ErlyWeb is Comet-Ready

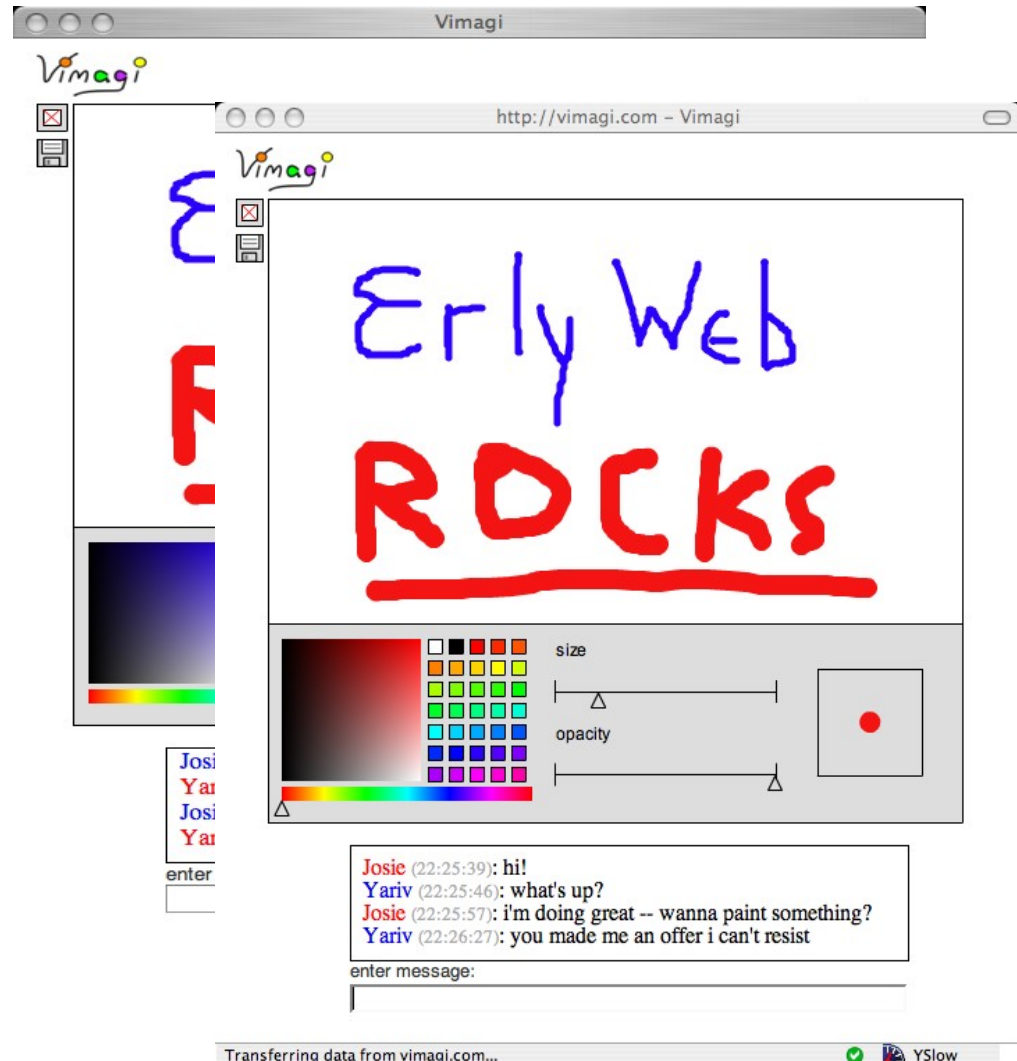
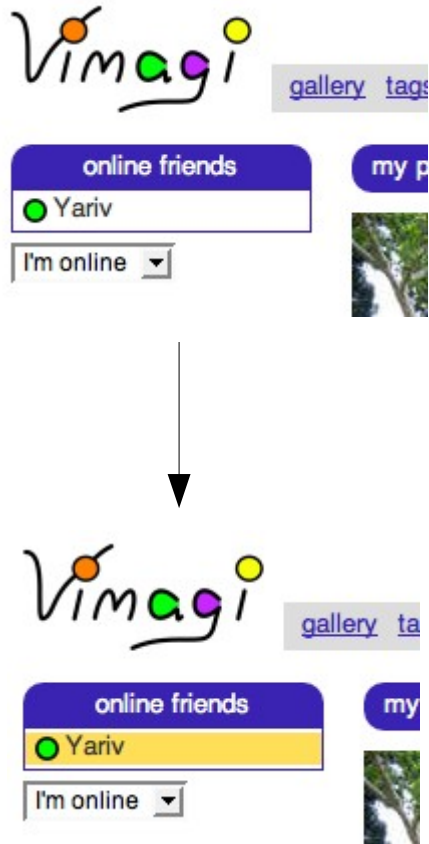
- Erlang was designed for building scalable, highly available (soft) real-time systems
 - Message passing primitives
 - Lightweight processes (location transparent)
 - Preemptive scheduling
 - Per-process heaps
 - Immutable data
 - Port-based interface to native code
 - Mnesia (distributed store for shared data)
 - Hot code swapping.
 - It scales (both vertically and horizontally)

Apache vs. Yaws



- Source: <http://www.sics.se/~joe/apachevsyaws.html>

Comet in Vimagi (Experimental)



Comet Implementation in Vimagi

- Users are permanently connected (except for during page transitions)
- One process per user
- Use Mnesia to look up PIDs by user names.
- Built a lightweight IM backend

Thank you

Links

- ErlyWeb (<http://erlyweb.org>)
- Erlang (<http://erlang.org>)
- Yaws (<http://yaws.hyber.org>)
- Vimagi (<http://vimagi.com>)
- BeerRiot (<http://beerriot.com>)