

# Lattice Core

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<https://github.com/drhuffman12/presentations/tree/master/lattice-core>

**IdeaBytes 2017**

# Lattice Core

Realtime-first web framework  
Based on  
Crystal, Kemal, WebSockets,  
Baked File System, etc.

**Jason Landry**

<https://github.com/jasonl99>

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# Lattice Core

Realtime-first web framework

## Server-side:

- **Ruby-like** developer-friendly source code syntax
- **C-like speed**
- **Single compiled application binary**
- **Web assets bundled**
- **Browser session connected to server WebSocket**

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## Client-side:

- Multiple **users**
- Multiple **content subscriptions** per user session
- **Sessions/WebSockets** tied to content subscribers
- All subscribers' content areas **dynamically updated**

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# Lattice Core

Realtime-first web framework

## Lattice Core

<https://github.com/jasonl99/lattice-core>

## Crystal-lang

<https://crystal-lang.org/>

## Kemal

<http://kemalcr.com/>

## Baked File System

[https://github.com/schovi/baked\\_file\\_system](https://github.com/schovi/baked_file_system)

## Card Game (Example Lattice Core App)

[https://github.com/jasonl99/card\\_game](https://github.com/jasonl99/card_game)

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# Lattice Core

Realtime-first web framework

## Install Git

<https://git-scm.com/>

## Install Crystal

<https://crystal-lang.org/docs/installation/index.html>

## Clone Card Game

`git clone https://github.com/jasonl99/card_game.git`

## Update dependencies

`shards update`

## Compile App

`crystal build --release src/card_game.cr`

## [Optional] Deploy only binary

```
mkdir -p ../elsewhere  
cp card_game ../elsewhere  
cd ../elsewhere  
# ... or to AWS or etc.
```

## Run server binary

`./card_game`

## Browse Web App

`http://0.0.0.0:3000/cardgame/<game_room>`

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# Lattice Core

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<https://github.com/drhuffman12/presentations/blob/master/lattice-core/>

LatticeCore.CardGame.mp4

The image displays two browser windows side-by-side, both showing a card game interface. The left window is Google Chrome, and the right is Mozilla Firefox. Both show a card game in progress with five cards visible: Ace of Hearts, King of Diamonds, 3 of Spades, 10 of Clubs, and 4 of Hearts. A chat log shows Rico saying 'hi' at 00:43:51 am. A sidebar on the right of each window shows game statistics: Games: 1, Maximum Subs: 2, Empty Games: 0, Total Subs: 2, Total Events: 18, Users: 2. Below the chat, a 'GameObserver (events from server's perspective)' table is visible. The table has columns: In/Out, User, WebObject, DOM Target, and Action. The right window also shows a 'Cards Remaining in deck: 47' and a 'GameObserver' table with more detailed events. At the bottom of the right window, a terminal-like log shows network activity and game state updates.

In/Out	User	WebObject	DOM Target	Action
Out	[Se...	CardGam...		["dom" => ["id" => "CardGame-3hrUhJXJM-chatname", "attribute" => "value...
In	Mo...	CardGam...	CardGame-3hr...	
Out	[Se...	CardGam...		["dom" => ["id" => "ChatRoom-3d0Jqaze-chatname", "attribute" => "value",...
Out	[Se...	CardGam...		["dom" => ["id" => "ChatRoom-3d0Jqaze-items", "attribute" => "data-max-c...
In	Mo...	CardGam...	ChatRoom-3d0...	
In	Rico	CardGam...	ChatRoom-3d0...	["value" => "hi"]
In	Rico	CardGam...	ChatRoom-3d0...	["value" => "hi"]
In	Rico	CardGam...	ChatRoom-3d0...	["value" => "hi"]

```
Sending class Hash(String, Hash(String, String))
Lattice::Connected::OutgoingEvent: new OutgoingEvent: {"dom" => ["id" => "MasterObserver-NoRyFyp9-total-events", "value" => "18", "action" => "update"]} for 2 sockets sending to hand
ler
Sending {"dom" => ["id" => "MasterObserver-NoRyFyp9-total-events", "value" => "18", "action"
" => "update"]} to 2 sockets
```

```
ffman 4096 Mar 6 23:53 ..
ffman 7844288 Mar 6 23:53 card_game
ffman 4096 Mar 7 00:40 card_game.db
ffman 0 Mar 7 00:40 connected.log
drhuffman-MacBookPro:~/summit_2017/github/jason199/elsewhere/B:
http://0.0.0.0:3000/cardgame/mb_summit_2017/
```

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# Lattice Core

## Realtime-first web framework

<https://github.com/drhuffman12/presentations/blob/master/lattice-core/>

LatticeCore.CardGame.mp4

The screenshot displays two browser windows side-by-side. The left window is Google Chrome, and the right is Mozilla Firefox. Both show a card game interface with five cards (Ace of Hearts, King of Hearts, 3 of Spades, 10 of Spades, 4 of Hearts) and a chat log. The chat log shows Rico saying 'hi' at 00:43:51 am and Morris saying 'there' at 00:44:19 am. Below the chat, there is a 'say something!' button and a 'game: mb summit 2017' label. The 'Cards Remaining in deck: 47' is also displayed. Below the game interface, a 'GameObserver (events from server's perspective)' table is visible, showing a list of events with columns for In/Out, User, WebObject, DOM Target, and Action. The table contains several rows of data, including events for Rico and Morris. The right window shows the same interface but with a 'say something!' button and a 'game: mb summit 2017' label. Below the game interface, a 'GameObserver (events from server's perspective)' table is visible, showing a list of events with columns for In/Out, User, WebObject, DOM Target, and Action. The table contains several rows of data, including events for Rico and Morris. The bottom of the image shows a blurred 'IdeaBytes 2017' logo.

0.0.0.0:3000/cardgame/mb\_summit\_2017 - Google Chrome

0.0.0.0:3000/cardgame/mb\_summit\_2017

Games: 1  
Maximum Subs: 2  
Empty Games: 0  
Total Subs: 2  
Total Events: 25  
Users: 2

Rico 00:43:51 am hi  
Morris 00:44:19 am there

say something!

game: mb summit 2017

Cards Remaining in deck: 47

GameObserver (events from server's perspective)

In/Out	User	WebObject	DOM Target	Action
Out	[Se...	CardGa...		{ "dom" => {"id" => "CardGame-3hrUhJXJM-chatname", "attribute" => "value..."
In	Mo...	CardGa...	CardGame-3hr...	{}
Out	[Se...	CardGa...		{ "dom" => {"id" => "ChatRoom-3d0Jqaze-chatname", "attribute" => "value..."
Out	[Se...	CardGa...		{ "dom" => {"id" => "ChatRoom-3d0Jqaze-items", "attribute" => "data-max-c..."
In	Mo...	CardGa...	ChatRoom-3d0...	{}
In	Rico	CardGa...	ChatRoom-3d0...	{ "value" => "hi" }
In	Rico	CardGa...	ChatRoom-3d0...	{ "value" => "hi" }
In	Rico	CardGa...	ChatRoom-3d0...	{ "value" => "hi" }

0.0.0.0:3000/cardgame/mb\_summit\_2017

Games: 1  
Maximum Subs: 2  
Empty Games: 0  
Total Subs: 2  
Total Events: 25  
Users: 2

Rico 00:43:51 am hi  
Morris 00:44:19 am there

say something!

game: mb summit 2017

Cards Remaining in deck: 47

GameObserver (events from server's perspective)

In/Out	User	WebObject	DOM Target	Action
Out	[S...	CardGa...		{ "dom" => {"id" => "CardGame-3hrUhJXJM-chatname", "attribute" => "valu..."
In	Rico	CardGa...	CardGame-3hr...	{}
Out	[S...	CardGa...		{ "dom" => {"id" => "ChatRoom-3d0Jqaze-chatname", "attribute" => "value..."
Out	[S...	CardGa...		{ "dom" => {"id" => "ChatRoom-3d0Jqaze-items", "attribute" => "data-max-..."
In	Rico	CardGa...	ChatRoom-3d...	{}
In	Rico	CardGa...	ChatRoom-3d...	{ "value" => "hi" }
In	Rico	CardGa...	ChatRoom-3d...	{ "value" => "hi" }
Out	[S...	CardGa...		{ "dom" => {"id" => "ChatRoom-3d0Jqaze-items", "value" => "<div class="..."

4096 Mar 6 23:53 ..  
7844288 Mar 6 23:53 card\_game  
4096 Mar 7 00:40 card\_game.db  
0 Mar 7 00:40 connected.log

dhuffman-MacBookPro:~/summit\_2017/github/jasonl99/elsewhere/B:  
http://0.0.0.0:3000/cardgame/mb\_summit\_2017

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# Lattice Core

## Realtime-first web framework

<https://github.com/drhuffman12/presentations/blob/master/lattice-core/>

LatticeCore.CardGame.mp4

The screenshot displays a web browser window showing a card game interface. The interface includes a header with the game name "mb\_summit\_2017" and a sidebar with statistics: Games: 1, Maximum Subs: 2, Empty Games: 0, Total Subs: 2, Total Events: 14499, and Users: 7266. The main area shows a chat log with messages from Rico and Morris, and a section for the game state, including "Cards Remaining in deck: 47". Below the chat is a "GameObserver (events from server's perspective)" table.

In/Out	User	WebObject	DOM Target	Action
Out	[Se... CardGa...		["dom" => {"id" => "CardGame-3hrUhJXJM-chatname", "attribute" => "value...	
In	Mo... CardGa...	CardGame-3hr...		
Out	[Se... CardGa...		["dom" => {"id" => "ChatRoom-3d0Jqaze-chatname", "attribute" => "value...	
Out	[Se... CardGa...		["dom" => {"id" => "ChatRoom-3d0Jqaze-items", "attribute" => "data-max...	
In	Mo... CardGa...	ChatRoom-3d0...		
In	Rico CardGa...	ChatRoom-3d0...	["value" => "hi"]	
In	Rico CardGa...	ChatRoom-3d0...	["value" => "hi"]	
Out	[S... CardGa...		["dom" => {"id" => "ChatRoom-3d0Jqaze-items", "value" => "<div class='...	

Below the browser window, a terminal window shows network logs and a command prompt. The logs include a "connected.log" entry and a "Running in test" message. The command prompt shows the command "wrk -c 100 -t 100 -d 60 http://0.0.0.0:3000/cardgame/mb\_summit\_2017" and the output "Running in test @ http://0.0.0.0:3000/cardgame/mb\_summit\_2017".

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# Lattice Core

Realtime-first web framework

Therefore, I think we should take a deeper look at new technologies that are **developer friendly** and **highly performant** like **Lattice-core**, **Kemal**, **Crystal**, and **WebSockets**, so that we can keep our **developers productive** and our **customers' experience zippy**.

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