



# Clojure in the Clouds

Micah Martin, 8th Light







**FREE**  
(to get started)

Java API  
(read Clojure)

Management  
Console  
(web based, powerful)

Easy Deployment  
(command line)

Version Tracking  
(of deployed code)



Google™  
App Engine

Datastore  
(big table)

Blobstore  
(for big stuff)

Transactional  
Email API  
(simple)

Incoming Email  
(very useful)

**HARD LIMITS**  
(makes things interesting)







heroku



slicehost

amazon  
web services™

# LEAN CODERS

*Code-casts for Software Professionals*

Welcome, Micah Martin Sign Out My Stuff My Account My Cart

Uncle Bob presents  
**Clean Code**  
Video Series

[Episode 1 - Clean Code](#)

[Episode 2 - Names++](#)

[Episode 3 - Functions](#)

[Episode 4 - Function Structure](#)

[Episode 5 - Form](#)

[Episode 6 - TDD - Part 1](#)

[Episode 6 - TDD - Part 2](#)

[Episode 7 - Architecture](#)

[Episode 8 - SOLID Foundations](#)



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~~gcv/appengine-magic~~

~~duelinmarker/appengine-clj~~

~~united~~



 Fully Tested

**gaeshi** 

GAE API 

 Highly Testable

Code Generator 

 Web Framework

Leiningen Plugin 

 Model/View/Controller

Dev Environments 

 Screaming Architecture

Dynamic src Reloading 



**gaeshi** 

Dashboard - Gaeshi Sample

**Google App Engine**

gaeshi-sample [High Replication] 0

My Applications

### Charts

Requests/Second

6 hrs 12 hrs 24 hrs 2 days 4 days 7 days 14 days 30 days

Main

- [Dashboard](#)
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Administration

- [Application Settings](#)
- [Permissions](#)
- [Blacklist](#)
- [Admin Logs](#)

Billing

- [Billing Settings](#)

### Instances

Number of Instances - <a href="#">Details</a>	Average QPS	Average Latency	Average Memory
1 total	0.067	5962.5 ms	67.6 MBytes

Billing Status: Free - [Settings](#)

Quotes reset every 24 hours. Next reset: 15 hrs

Resource	Usage
Frontend Instance Hours	3% 0.74 of 28.00 Instance Hours
Backend Instance Hours	0% 0.00 of 9.00 Instance Hours
Datastore Stored Data	0% 0.00 of 1.00 GBytes
Task Queue Stored Task Bytes	0% 0.00 of 0.49 GBytes
Blobstore Stored Data	0% 0.00 of 5.00 GBytes
Datastore Write Operations	0% 0.00 of 0.05 Million Ops
Datastore Read Operations	0% 0.00 of 0.05 Million Ops



# gaeshi

Welcome, Micah Martin Sign Out My Stuff My Account My Cart

## LEAN CODERS

Code-casts for Software Professionals

Uncle Bob presents

### Clean Code

Video Series

- Episode 1 - Clean Code
- Episode 2 - Names++
- Episode 3 - Functions
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- Clean Code, Episode 6 - TDD - Part 1
- Clean Code, Episode 6 - TDD - Part 2
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IN THE NEWS

How Chicago Tech Companies are Helping College Grads

FEATURED CLIENTS

FIDELITYLIFE

**8th Light**  
Software is our *craft*™

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**We are software craftsmen.**

At 8th Light, we craft web applications that are beautiful, durable and free of defects in workmanship.



**gaeshi** 

**gaeshi** 



gaeshi



**FREE**  
(to get started)

**Awesome!**  
(really)

**Beautiful Website**  
(heroku.com)

**Oh So Easy  
Deployment**  
(command line)



**Cedar Stack**  
(supports Java/Clojure)

**All OSS**  
(freedom!)

**Simple Gem  
Admin**  
(very useful)

**Not Full Stack**  
(compared to GAE)



heroku





gaeshi



***jetty://***



**mmcgrana/ring**

(HTTP Simplifications / Middleware,

**joodo** The joodo logo consists of the word 'joodo' in a large, dark font with a black arrow pointing upwards through the letter 'o', followed by a red circular graphic.



**weavejester/compojure**

(routing)



**weavejester/hiccup**

(HTML generation)



joodo



heroku



jodo()

Introducing Google's AI-powered OCR technology for documents you've sent to Gmail using the Google plugin. Follow the links above to learn more about how to use the latest version of the Google Cloud Platform's signature document processing API.



# specclj

*a TDD/BDD framework for Clojure*  
pronounced "speckle" [spec-uhl]

.

# joodo

[Installation](#)  
[Tutorial](#)  
[Documentation](#)  
[Plugins](#)  
[Community](#)  
[Feature Requests](#)

API

SAMPLE APPLICATION

ABOUT

COMMUNITY

[License Info](#) | [Git Repository](#)

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## A WEB APPLICATION FRAMEWORK FOR CLOJURE

Born of a need to build fast, clean web applications, Joodo uniquely satisfies a need of Clojure frameworks. Taking inspiration from the self-discipline of martial arts and the attention to detail of Old World artisans, Joodo is a carefully crafted tool that will aid you in forging the best applications you can imagine.

Joodo is an open-source project, free for all, and constantly updated.

### INSTALLATION

Installing Joodo is as easy as your favorite pie (eating, not baking): all you need is Leiningen and the Joodo plugin. Follow the [latest tutorial](#) on Leiningen's github account to acquire the latest version, then visit your terminal to install the Joodo plugin:



joodo

joodo



joodo

gaeshi



joodo

gaeshi



# A Closer Look



# Development Environment

\$ lein joodo server

```
Reloading...
#<File ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/admin/util.clj>
#<File ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_device.clj>
#<File ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_devices_controller.clj>
#<File ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/controller.clj>
#<File ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/model.clj>

REQUEST 2 =====
{
  :body          org.mortbay.jetty.HttpParser$Input@32bd638e
  :character-encoding nil
  :content-length   nil
  :content-type     nil
  :cookies        {
    :JSESSIONID      {:value "1s9b4cq264xi71iqo5lcruv5qe"}
    :b               {:value "a1120df6-9120-11e0-b2a8-00264afffe00"}
    :dev_appserver_login {:value "test"}
    :l               {:value "administrator5274"}
    :viewer-name     {:value "test@example.com"}
    :visited         {:value true}}
  :form-params    {}
  :headers        {
    accept          /* 
    accept-charset ISO-8859-1,utf-8;q=0.7,*;q=0.3
    accept-encoding gzip,deflate,sdch
    accept-language en-US,en;q=0.8
    connection     keep-alive
    cookie         visited=true; b=a1120df6-9120-11e0-b2a8-00264afffe00; l=administrator5274; viewer-name=test@example.com; dev_appserver_login=test@example.com:18580476422013912411; JSESSIONID=1s9b4cq264xi71iqo5lcruv5qe
    host           localhost:8080
    user-agent     Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_3) AppleWebKit/535.11 (KHTML, like Gecko) Chrome/17.0.963.56 Safari/535.11}
  :multipart-params 0
  :params         0
  :query-params   0
  :query-string   nil
  :remote-addr    0:0:0:0:0:0:1%0
  :request-method :get
  :scheme         :http
  :server-name    localhost
  :server-port    8080
  :servlet        joodo.kake.JoodoServlet@3be48d5
  :servlet-context ServletContext@3aeb283b{/file:/Users/micahmartin/Projects/hosemonster/server/}
  :servlet-response com.google.appengine.api.blobstore.dev.ServeBlobFilter$ResponseWrapper@7fe27dce
  :session        {}
  :uri            /favicon.ico}

RESPONSE 2 =====
{
  :body      624 chars of body
  :headers  {}
  :status   404}
```



# Development Environment

## src Automatically Reloaded!

```
Reloading...
#&file ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/admin/util.clj>
#&file ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_device.clj>
#&file ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_devices_controller.clj>
#&file ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/controller.clj>
#&file ./Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/model.clj>

REQUEST 2 =====
{
  :body          org.mortbay.jetty.HttpParser$Input@32bd638e
  :character-encoding nil
  :content-length   nil
  :content-type     nil
  :cookies        {
    :JSESSIONID      {:value "1s9b4cq264xi71iqo5lcruv5qe"}
    :b              {:value "a1120df6-9120-11e0-b2a8-00264afffe00"}
    :dev_appserver_login  {:value "test"}
    :l              {:value "administrator5274"}
    :viewer-name     {:value "test@example.com"}
    :visited         {:value true}}
  :form-params    {}
  :headers        {
    accept          /* 
    accept-charset ISO-8859-1,utf-8;q=0.7,*;q=0.3
    accept-encoding gzip,deflate, sdch
    accept-language en-US,en;q=0.8
    connection     keep-alive
    cookie          visited=true; b=a1120df6-9120-11e0-b2a8-00264afffe00; l=administrator5274; viewer-name=test@example.com; dev_appserver_login=test@example.com:18580476422013912411; JSESSIONID=1s9b4cq264xi71iqo5lcruv5qe
    host           localhost:8080
    user-agent     Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_3) AppleWebKit/535.11 (KHTML, like Gecko) Chrome/17.0.963.56 Safari/535.11}
    :multipart-params  {}
    :params         {}
    :query-params   {}
    :query-string   nil
    :remote-addr    0:0:0:0:0:0:1%0
    :request-method :get
    :scheme         :http
    :server-name    localhost
    :server-port    8080
    :servlet        joodo.kake.JoodoServlet@3be48d5
    :servlet-context ServletContext@3aeb283b{/ ,file:/Users/micahmartin/Projects/hosemonster/server/}
    :servlet-response com.google.appengine.api.blobstore.dev.ServeBlobFilter$ResponseWrapper@7fe27dce
    :session        {}
    :uri            /favicon.ico}

RESPONSE 2 =====
{
  :body      624 chars of body
  :headers  {}
  :status   404}
```



# Development Environment

# Pretty Printed Ring Request

```
Reloading...
#File /Users/micahmartin/Projects/hosemonster/server/src/hosemonster/admin/util.clj>
#File /Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_device.clj>
#File /Users/micahmartin/Projects/hosemonster/server/src/hosemonster/flow_devices/flow_devices_controller.clj>
#File /Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/controller.clj>
#File /Users/micahmartin/Projects/hosemonster/server/src/hosemonster/util/model.clj>

REQUEST 2 =====
{
  :body          org.mortbay.jetty.HttpParser$Input@32bd630e
  :character-encoding nil
  :content-length nil
  :content-type   nil
  :cookies        {
    :JSESSIONID      {:value "1s9b4cq264xi71iqo5lcruw5qe"}
    :b                {:value "a1120df6-9120-11e0-b2a8-00264afffe00"}
    :dev_appserver_login {:value "test"}
    :l                {:value "administrator5274"}
    :viewer-name       {:value "test@example.com"}
    :visited          {:value "true"}}
  :headers        {}
  :method         :get
  :uri             "/FlowDevices"
```



# Development Environment

## ... and Ring Response

```
REQUEST 2 =====
{
  :body          org.mortbay.jetty.HttpParser$Input@32bd630e
  :character-encoding nil
  :content-length   nil
  :content-type     nil
  :cookies        {
    :JSESSIONID      {:value "1s9b4cq264xi71iqo5lcruw5qe"}
    :b               {:value "a1120df6-9120-11e0-b2a8-00264afffe00"}
    :dev_appserver_login {:value "test"}
    :l               {:value "administrator5274"}
    :viewer-name      {:value "test@example.com"}
    :visited         {:value+ "true"}}
  :form-params    {}
  :headers        {
    accept           /* */
    accept-charset  ISO-8859-1,utf-8;q=0.7,*;q=0.3
    accept-encoding gzip,deflate, sdch
    accept-language en-US,en;q=0.8
    connection      keep-alive
    cookie          visited=true; JSESSIONID=1s9b4cq264xi71iqo5lcruw5qe
    host            localhost:8080
    user-agent      Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_3) AppleWebKit/535.11 (KHTML, like Gecko) Chrome/17.0.963.56 Safari/535.11
  :multipart-params {}
  :params         {}
  :query-params   {}}
```

## Flow Devices

Name	K-Factor	Min PSI	Max PSI	Category
2" Pitotless Nozzle + 2 1/2"	164.8	10	80	Pitot
2" Pitotless Nozzle + Little Hose Monster	156.0	10	70	Noz



# Testing Support

\$lein spec

```
.....  
6 .....[cleancoders.model.cart :only (get-open-cart-for cart-pric-  
7 .....[cleancoders.model.order :only (order add-payment add-order-  
8 .....[cleancoders.model.gift-card-payment :only (gift-card-paymen-  
9 .....[cleancoders.model.license :only (activate! cost-of)]  
.....
```

Finished in 1.77502 seconds  
128 examples, 0 failures

## Spec Helpers:

- view
- controller

## Gaeshi only:

- datastore
- mail
- users





# Testing Support

\$ lein spec -a

```
----- Thu Mar 15 23:27:48 UTC 2012 -----
took 0.00969 seconds to determine file statuses
reloading files:
common.clj
    /Users/micahmartin/Projects/hosemonster/server
ft.clj
    /Users/micahmartin/Projects/hosemonster/server
movie_controller.clj
    /Users/micahmartin/Projects/hosemonster/server
permission_controller.clj

API_Controller.clj
- failed login
newer_controller.clj
- valid login
n_controller.clj
- won't allow call without valid api token
y_controller.clj
- will allow call with valid token
controller.clj
- unrecognized api called are denied
- includes user and account for given account
coder_controller.clj
- pulls controller data for a given account
updating_controller.clj
- saves a new record
- updates an existing record
e_validation.clj
invalid record
_controller.clj
validates valid record
_controller.clj
- deletes an existing record
_controller.clj

StreamController.clj
saves all the fields
options_controller.clj
validations
r_controller.clj
- on test point key
- on flow device
- on nozzle pressure
cout.clj

Finished in 0.20609 seconds
16 examples, 0 failures
```

```
18 :amount (* -1) :adjustment withdraw
19 :transaction-id (:transaction-id wi
20 :gift-card-code (:code withdrawal))
spec/hosemonster/api/api_controller_spec.clj
spec/hosemonster/stream_spec.clj withdrawal! [order withdrawal]
src/hosemonster/api/api_controller.clj
src/hosemonster/stream.clj order (save (withdrawal)
25 (add-order-error order (str (:reason
26
27 (defn calculate-gift-card-application [
28   (let [cards (map balance codes)
29     cards (filter :ok? cards)
30     cards (filter #(> (:balance %)
31     balances (map #(max 0 %) (reduce
32     cards (map assoc cards (repeat
33     applications (map #(min (:remain
34     (map assoc cards (repeat :applied-b
35
36   (fn [apply-gift-card!] [order cart-to-
37   (let [cards (process-gift-card-applications
38     cards (take-while #(> (:applied-
39     withdrawals (map #(withdraw (:amount
40     (reduce process-withdrawal! order w
41
42 (defn- send-receipt-emails [order cart]
43   (let [viewer (find-by-key (:viewer-key
44     cart-items (cart-contents cart)
45     items (map #(hash-map :description
46     payments (find-by-keys (:payments
47     payment-total (reduce + (map :a
48     amount-due (- (:total order) na
```

# AutoTest!



# Controllers

## Conventionally named Var/Handler

```
1 (ns cleancoders.controller.cleancoders-controller
2   (:use
3     [compojure.core]
4     [gaeshi.views :only (render-template)])
5     [gaeshi.datastore :only (string->key find-by-key)]))
6
7 (defroutes cleancoders-controller
8   (GET "/cleancoders/contact" []
9     (render-template "cleancoders/contact")))
10  (GET "/cleancoders/license-levels" [])
11    (render-template "cleancoders/license_levels")))
```



# Controllers

Glue and magic to quick initial response

```
26  (defroutes cleancoders-wrapped
27    cleancoders-root
28    (controller-router 'cleancoders.controller)
29    (not-found (render-template "not_found"
30                           :template-root "cleancoders/view"
31                           :ns `cleancoders.views))))
```



# Views

## .hiccup files

```
1 (let [destination (:destination *view-context*)]
2   (list
3     [:form {:id "redirect-form"
4       :action (:uri destination)
5       :method (name (:request-method destination))
6       :accept-charset "utf-8"}
7     (for [[key value] (seq (:params destination))]
8       [:input {:type "hidden"
9         :name (name key)
10        :value value}])
11     [:div {:style "text-align: center; margin: 20px;"}
12       [:h1 (or (:message *view-context*) "One moment please.")]]
13     [:div {:style "text-align: center; margin: 20px;"}
14       [:img {:src "/images/spinner.gif"}]]
15     (javascript-tag
16       "setTimeout(function(){$('#redirect-form').submit();},
170);))))
```



# Middleware

Provided for your convenience

- **session:** provides user sessions
- **cookie:** convenience cookie access
- **flash:** single request session data
- **keyword-cookie:** uniform cookie access
- **params:** get your form data
- **multipart-params:** for uploads and such
- **keyword-params:** uniform param access
- **bind-request:** ubiquitous \*request\* var

joodo



Noir



joodo

gaeshi

<http://joodoweb.com>

Micah Martin

@slagyr

Google Reader × Java Platform S × slagyr's Profile × Google Apps × Hosemonster: × Logs - Clean C × Google Apps × Dashboard - C × File:Google Ap

← → ⌂ Google Inc [US] https://appengine.google.com/dashboard?&app\_id=cleancoders&version\_id=20120212.356772919278672540

personal code 8thLight CleanCoders fla EW rss groupon braintree enova

# Google app engine

micah@cleancoders.com

cleancoders 20120212

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Resources

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- [Developer Forum](#)

**Charts** [?](#)

Requests/Second [▼](#) 6 hrs 12 hrs 24 hrs 2 days 4 days 7 days 14 days 30 days

**Instances** [?](#)

Number of Instances - <a href="#">Details</a>	Average QPS	Average Latency	Average Memory
6 total (3 Resident)	0.028	358.3 ms	88.6 MBytes

**Billing Status:** Enabled ( Daily budget: \$100.30 ) - [Settings](#) Quotas reset every 24 hours

Resource	Usage	Billable	Price	Cost
Frontend Instance Hours	115.91 Instance Hours	87.91	\$0.08/ Hour	\$7.04
Backend Instance Hours	0.00 Instance Hours	0.00	\$0.08/ Hour	\$0.00
Datastore Stored Data	0.17 GBytes	0.00	\$0.008/ GByte-day	\$0.00
Task Queue Stored Task Bytes	0.00 GBytes	0.00	\$0.008/ GByte-day	\$0.00
Blobstore Stored Data	18.58 GBytes	13.58	\$0.0043/ GByte-day	\$0.06
Datastore Write Operations	0.03 Million Ops	0.00	\$1.00/ Million Ops	\$0.00
Datastore Read Operations	0.02 Million Ops	0.00	\$0.70/ Million Ops	\$0.00
Datastore Small Operations	0.00 Million Ops	0.00	\$0.10/ Million Ops	\$0.00
Outgoing Bandwidth	15.35 GBytes	14.35	\$0.12/ GByte	\$1.73
Recipients Emailed	8	0	\$0.01/ 100 Recipients	\$0.00
Stanzas Sent	0	0	\$0.10/ 100K Stanzas	\$0.00
Channels Created	0% 0 of 95,040	0	\$0.01/ 100 Opens	\$0.00

Estimated cost for the last 21 hours: \$8.75\*

