Chapter 1: Quick Start with Java

```
[  
  - {  
      id: 1,  
      name: "Quick start with Java"  
  },  
  - {  
      id: 2,  
      name: "Reactive Web with Spring Boot"  
  },  
  - {  
      id: 3,  
      name: "...and more!"  
  }  
]```
Chapter 2: Reactive Web with Spring Boot
Chapter 3: Reactive Data Access with Spring Boot
# Learning Spring Boot - 2nd Edition

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>learning-spring-boot-cover.jpg</td>
<td><img src="learning-spring-boot-cover.jpg" alt="Image" /></td>
<td>Delete</td>
</tr>
<tr>
<td>3</td>
<td>bazinga.png</td>
<td><img src="bazinga.png" alt="Image" /></td>
<td>Delete</td>
</tr>
<tr>
<td>2</td>
<td>learning-spring-boot-2nd-edition-cover.jpg</td>
<td><img src="learning-spring-boot-2nd-edition-cover.jpg" alt="Image" /></td>
<td>Delete</td>
</tr>
</tbody>
</table>

Choose File: No file chosen

Upload

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>bazinga.png</td>
<td><img src="bazinga.png" alt="Image" /></td>
<td>Delete</td>
</tr>
<tr>
<td>2</td>
<td>learning-spring-boot-2nd-edition-cover.jpg</td>
<td><img src="learning-spring-boot-2nd-edition-cover.jpg" alt="Image" /></td>
<td>Delete</td>
</tr>
</tbody>
</table>

```javascript
// Code snippets demonstrating database operations...
```

```java
// Code snippets demonstrating reactive operations...
```
Chapter 4: Testing with Spring Boot

```java
package com.greglturnquist.learningspringboot;

class ImageTests {
    @Test
    public void imagesManagedByLombokShouldWork() {
        Image image = new Image("id", "file-name.jpg");
        assertEquals(image.getId(), "id");
        assertEquals(image.getName(), "file-name.jpg");
    }
}
```
Learning Spring Boot - 2nd Edition

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>learning-spring-boot-cover.jpg</td>
<td>delete</td>
</tr>
<tr>
<td>2</td>
<td>learning-spring-boot-2nd-edition-cover.jpg</td>
<td>delete</td>
</tr>
<tr>
<td>3</td>
<td>bazinga.png</td>
<td>delete</td>
</tr>
</tbody>
</table>

Choose File No file chosen

Upload
Chapter 5: Developer Tools for Spring Boot Apps

Learning Spring Boot - 2nd Edition

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>57f16c0883a5d2446f27602e</td>
<td>test</td>
<td><img src="image.png" alt="Image" /></td>
<td>Delete</td>
</tr>
<tr>
<td>57f16c0883a5d2446f27602f</td>
<td>test2</td>
<td><img src="image.png" alt="Image" /></td>
<td>Delete</td>
</tr>
<tr>
<td>57f16c0883a5d2446f276030</td>
<td>test3</td>
<td><img src="image.png" alt="Image" /></td>
<td>Delete</td>
</tr>
</tbody>
</table>

Choose File  No file chosen

Upload

Learning Spring Boot - 2nd Edition

Using the LiveReload plugin in your browser will speed up efforts.
Learning Spring Boot - 2nd Edition

Using the LiveReload plugin in your browser will speed up efforts.

DevTools can also detect code changes too

Run/Debug Configurations

- Main class: com.gregturnquist.learningspringboot.LearningSpringBootApplication
- Program arguments: --debug

Log:

2016-09-30 14:57:52.106 DEBUG 50763 --- [ restartedMain] o.s.b.a.e.jmx.EndpointMBean #50764
2016-09-30 14:57:52.128 DEBUG 50763 --- [ restartedMain] autoConfigurationReporter

AUTO-CONFIGURATION REPORT

Positive matches:

- AuditAutoConfiguration#auditListener matched
  - @ConditionalOnMissingBean (types: org.springframework.boot.actuate.autoconfigure
- AuditAutoConfiguration.AuditEventRepositoryConfiguration matched
  - @ConditionalOnMissingBean (types: org.springframework.boot.actuate.autoconfigure
```json
{
   "_links": {
      "self": {
         "href": "http://localhost:8080/application",
         "templated": false
      },
      "auditevents": {
         "href": "http://localhost:8080/application/auditevents",
         "templated": false
      },
      "beans": {
         "href": "http://localhost:8080/application/beans",
         "templated": false
      },
      "autoconfig": {
         "href": "http://localhost:8080/application/autoconfig",
         "templated": false
      },
      "configprops": {
         "href": "http://localhost:8080/application/configprops",
         "templated": false
      },
      "env": {
         "href": "http://localhost:8080/application/env",
         "templated": false
      },
      "env-toMatch": {
         "href": "http://localhost:8080/application/env/{toMatch}",
         "templated": true
      },
      "health": {
         "href": "http://localhost:8080/application/health",
         "templated": false
      },
      "status": {
         "href": "http://localhost:8080/application/status",
         "templated": false
      }
   }
}
```
"positiveMatches": {
  "AuditAutoConfiguration#AuditListener": [
    {
      "condition": "OnBeanCondition",
      "message": "@ConditionalOnMissingBean (types: org.springframework.boot.actuate.listener.AuditListener; SearchStrategy: all) did not find any beans"
    }
  ],
  "AuditAutoConfiguration.AuditEventRepositoryConfiguration": [
    {
      "condition": "OnBeanCondition",
      "message": "@ConditionalOnMissingBean (types: org.springframework.boot.actuate.audit.AuditEventRepository; SearchStrategy: all) did not find any beans"
    }
  ],
  "AuditEventEndpointAutoConfiguration#AuditEventsEndpoint": [
    {
      "condition": "OnBeanCondition",
      "message": "@ConditionalOnMissingBean (types: org.springframework.boot.actuate.audit.AuditEventRepository; SearchStrategy: all) found bean 'auditEventRepository'; @ConditionalOnMissingBean (types: org.springframework.boot.actuate.audit.AuditEventsEndpoint; SearchStrategy: all) did not find any beans"
    }
  ]
}
Learning Spring Boot - 2nd Edition

It's really handy to make local edits and watch them go out to the cloud automatically.
{
    "status": "DOWN",
    "details": {
        "mongo": {
            "status": "UP",
            "details": {
                "version": "3.4.6"
            }
        },
        "diskSpace": {
            "status": "UP",
            "details": {
                "total": 498937626624,
                "free": 43624402944,
                "threshold": 10485760
            }
        },
        "learningSpringBoot": {
            "status": "DOWN",
            "details": {
                "HTTP Status Code": 404
            }
        }
    }
}
<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>57f07b6c8dd1b00a1c3cee4a</td>
<td>B05771_MockupCover_Normal.jpg</td>
<td></td>
</tr>
<tr>
<td>57f07b788dd1b00a1c3cee4b</td>
<td>spring-boot-project-logo.png</td>
<td></td>
</tr>
<tr>
<td>57f07ba48dd1b00a1c3cee4d</td>
<td>bazinga.png</td>
<td></td>
</tr>
</tbody>
</table>
Starting LearningSpringBootApplication in 6.655 seconds.
## Learning Spring Boot - 2nd Edition

### Table of Images

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Delete</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 57f8641e83a5d272b18d4ce1 | B05771_MockupCover_Normal.jpg | ![Cover](image) | ![Delete](image) | - I love the cover!  
- Can I order a copy yet? |
| 57f86436b83a5d272b18d4ce3 | bazinga.png | ![Bazinga](image) | ![Delete](image) |  |
| 57f8645883a5d272b18d4ce5 | spring-boot-project-logo.png | ![Spring Boot Logo](image) | ![Delete](image) | - Spring Boot is awesome! |

Choose File: No file chosen

Upload

---

**Configuration**

- **Main class:** com.greglturnquist.learningspringboot.LearningSpringBootApplication
- **VM options:**
- **Program arguments:**
- **Working directory:**
- **Environment variables:**
- **Use classpath of module:** 6_part2_main
- **JRE:** Default (1.8 – SDK of ’6_part2_main’ module)
- **Spring Boot Settings**
  - [ ] Enable debug output  
  - [ ] Hide Banner
- **Active Profiles:** simulator
integration.channel.output.errorRate.mean: 0,
integration.channel.output.errorRate.max: 0,
integration.channel.output.errorRate.min: 0,
integration.channel.output.errorRate.stdev: 0,
integration.channel.output.errorRate.count: 0,
integration.channel.output.sendCount: 1080,
integration.channel.output.sendRate.mean: 33.2953175275134,
integration.channel.output.sendRate.max: 0.10356745398044587,
integration.channel.output.sendRate.min: 0.00007268595695495606,
integration.channel.output.sendRate.stdev: 127.44592804513556,
integration.channel.output.sendRate.count: 1080,
integration.channel.output.receiveCount: -1,
integration.channel.input.errorRate.mean: 0,
integration.channel.input.errorRate.max: 0,
integration.channel.input.errorRate.min: 0,
integration.channel.input.errorRate.stdev: 0,
integration.channel.input.errorRate.count: 0,
integration.channel.input.sendCount: 1080,
integration.channel.input.sendRate.mean: 30.60592083415993,
integration.channel.input.sendRate.max: 0.10221006900072098,
integration.channel.input.sendRate.min: 0.000672169029712677,
integration.channel.input.sendRate.stdev: 20.733646866079425,
integration.channel.input.sendRate.count: 1080,
integration.channel.input.receiveCount: -1,
{
  "status": "UP",
  "learningSpringBoot": {
    "status": "UP"
  },
  "diskSpace": {
    "status": "UP",
    "total": 498937626624,
    "free": 89344151552,
    "threshold": 10485760
  },
  "rabbit": {
    "status": "UP",
    "version": "3.6.4"
  },
  "mongo": {
    "status": "UP",
    "version": "3.2.6"
  },
  "binders": {
    "status": "UP",
    "rabbit": {
      "status": "UP",
      "binderHealthIndicator": {
        "status": "UP",
        "version": "3.6.4"
      }
    }
  }
}

Created new connection: rabbitConnectionFactory=147897b38f/SimpleConnection@31792ab
Channel 'unknown.channel.name' has 1 subscriber(s).
Binding outputs for :interface org.springframework.cloud.stream.messaging.Processor output
Channel 'application.output' has 1 subscriber(s).
Channel 'application.errorChannel' has 1 subscriber(s).
Starting beans in phase 0
Adding (logging-channel-adapter::org.springframework.cloud.stream.errorLogger) as a Channel 'application.errorChannel' has 1 subscriber(s).
Starting beans in phase 3147483647
Binding inputs for interface org.springframework.cloud.stream.messaging.Source
Binding inputs for interface org.springframework.cloud.stream.messaging.Processor
Binding inputs for interface org.springframework.cloud.stream.messaging.Processor
Assigning queue for inbound: learning-spring-boot-comments,learning-spring-boot, bx
autoBindDLQ=false for: learning-spring-boot-comments,learning-spring-boot
started inbound,learning-spring-boot
Adding (message-handler:inbound,learning-spring-boot-comments,learning-spring-boot)
started inbound,learning-spring-boot
Chapter 7: Microservices with Spring Boot

Generate a Gradle Project with Java and Spring Boot 2.0.0 (SNAPSHOT)

Project Metadata
Artifact coordinates
Group
com.greglturnquist.learnspringboot
Artifact
learning-spring-boot-eureka-server

Dependencies
Add Spring Boot Starters and dependencies to your application
Search for dependencies
Web, Security, JPA, Actuator, Devtools...
Selected Dependencies
Eureka Server

Generate Project
System Status

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>test</td>
</tr>
<tr>
<td>Data center</td>
<td>default</td>
</tr>
<tr>
<td>Current time</td>
<td>2016-10-20T22:42:53 -0500</td>
</tr>
<tr>
<td>Uptime</td>
<td>00:19</td>
</tr>
<tr>
<td>Lease expiration enabled</td>
<td>false</td>
</tr>
<tr>
<td>Renews threshold</td>
<td>5</td>
</tr>
<tr>
<td>Renews (last min)</td>
<td>4</td>
</tr>
</tbody>
</table>

DS Replicas

Instances currently registered with Eureka

<table>
<thead>
<tr>
<th>Application</th>
<th>AMIs</th>
<th>Availability Zones</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMENTS</td>
<td>n/a (1)</td>
<td>(1)</td>
<td>UP (1) - retina:comments:9000</td>
</tr>
<tr>
<td>IMAGES</td>
<td>n/a (1)</td>
<td>(1)</td>
<td>UP (1) - retina:images</td>
</tr>
</tbody>
</table>

{ }
## Learning Spring Boot - 2nd Edition

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>589914283a5d2ac3e0e0a0f6</td>
<td>platform-spring-boot.png</td>
<td>![Image]</td>
<td>Delete</td>
</tr>
<tr>
<td>589916283a5d2ac3e0e0a0f7</td>
<td>B05771_MockupCover_Normal.jpg</td>
<td>![Image]</td>
<td>Delete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose File: No file chosen

Upload

## DS Replicas

### Instances currently registered with Eureka

<table>
<thead>
<tr>
<th>Application</th>
<th>AMIs</th>
<th>Availability Zones</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMENTS</td>
<td>n/a  (2)</td>
<td>(2)</td>
<td>UP (2) - retina:comments:9001, retina:comments:9000</td>
</tr>
<tr>
<td>IMAGES</td>
<td>n/a  (1)</td>
<td>(1)</td>
<td>UP (1) - retina:images</td>
</tr>
</tbody>
</table>
Hystrix Dashboard

http://localhost:8080/hystrix.stream


Delay: 2000 ms Title: images

Monitor Stream

Hystrix Stream: http://localhost:8080/hystrix.stream

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Sort: Error then Volume</th>
<th>Alphabetic</th>
<th>Volume</th>
<th>Error</th>
<th>Mean</th>
<th>Median</th>
<th>90</th>
<th>99</th>
<th>99.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>getComments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host: 0.0/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster: 0.0/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuit Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hosts</td>
<td>Median</td>
<td>Mean</td>
<td>90th</td>
<td>99th</td>
<td>0ms</td>
<td>0ms</td>
<td>66.5th</td>
<td>0ms</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>90th</td>
<td>0ms</td>
<td>0ms</td>
<td>0ms</td>
<td>66.5th</td>
<td>0ms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thread Pools Sort: Alphabetic | Volume

<table>
<thead>
<tr>
<th>CommentHelper</th>
<th>Host: 0.0/s</th>
<th>Cluster: 0.0/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>0</td>
<td>Max Active</td>
</tr>
<tr>
<td>Queued</td>
<td>0</td>
<td>Executions</td>
</tr>
<tr>
<td>Pool Size</td>
<td>3</td>
<td>Queue Size</td>
</tr>
</tbody>
</table>
getComments

<table>
<thead>
<tr>
<th>57</th>
<th>0</th>
<th>0</th>
<th>0.0 %</th>
</tr>
</thead>
</table>

Host: 6.0/s
Cluster: 6.0/s
Circuit: Closed

Hosts: 1
Median: 15ms
Mean: 21ms
90th: 99th: 24ms
99.5th: 338ms

```
// 20170813194344
// http://localhost:8888/eureka/default

  
  {  
      "name": "eureka",
      "profiles": [
        "default"
      ],
      "label": "null",
      "version": "a69475c0e47bc91949e76c79d2df39728967a21",
      "state": "null",
      "propertySources": [  
          {  
              "name": "https://github.com/gregturn/learning-spring-boot-config-repo/eureka.yml",
              "source": {  
                  "server.port": 8761,
                  "eureka.instance.hostname": "localhost",
                  "eureka.client.registerWithEureka": false,
                  "eureka.client.fetchRegistry": false,
                  "eureka.client.serviceUrl.defaultZone": "http://$eureka.instance.hostname:$[server.port]/eureka/"
              }
          }
      ]
  }
```
F:

or: Fetching config from server at: http://localhost:8888

or: Located environment: name=comments, profiles=[default], label=master, 

ion: Located property source: CompositePropertySource [name='configService', 

ion: No active profile set, falling back to default profiles: default
## Chapter 8: WebSockets with Spring Boot

<table>
<thead>
<tr>
<th>Name</th>
<th>Image</th>
<th>Action</th>
<th>Comment</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>B05771_MockupCover_Normal_.jpg</td>
<td><img src="image1.png" alt="Image" /></td>
<td>Delete</td>
<td>Nice cover!</td>
<td>Submit</td>
</tr>
<tr>
<td>bazinga.png</td>
<td><img src="image2.png" alt="Image" /></td>
<td>Delete</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Received `{"id":"599b90ce4d95697c2b2a888b","imageId":"0c84bee9-f44f-48bf-9c6a-558dab29c9d2","comment":"Nice cover!"}`
Greetings!

2f05fa8e: Do you like the new cover?
298b3bdf: You bet! Wish I could get it in a t-shirt
2f05fa8e: Me too. Did you get e-book, or print?
298b3bdf: Both
298b3bdf: I always get both

Publishing "Do you like the new cover?"
Received 2f05fa8e: Do you like the new cover?
Received 298b3bdf: You bet! Wish I could get it in a t-shirt
Publishing "Me too. Did you get e-book, or print?"
Received 2f05fa8e: Me too. Did you get e-book, or print?
Received 298b3bdf: Both
Received 298b3bdf: I always get both

Publishing "You bet! Wish I could get it in a t-shirt"
Received 298b3bdf: You bet! Wish I could get it in a t-shirt
Received 2f05fa8e: Me too. Did you get e-book, or print?
Publishing "Both"
Received 298b3bdf: Both
Publishing "I always get both"
Received 298b3bdf: I always get both

>
Greetings!

(greg)(all): Do you like the cover?

Greetings!

(greg)(all): Do you like the cover?
(oliver)(all): I sure do
Greetings!

(greg)(all): Do you like the cover?
(oliver)(all): I sure do

@greg Are you going to offer it in a t-shirt?

Greetings!

(greg)(all): Do you like the cover?
(oliver)(all): I sure do
(phil): @greg Are you going to offer it in a t-shirt?

Greetings!

(greg)(all): Do you like the cover?
(oliver)(all): I sure do
Publishing "Do you like the new cover?"

Received (greg)(all): Do you like the new cover?

Received (oliver)(all): I sure do.

Received (phil): @greg Are you going to offer it in a t-shirt?
Chapter 9: Securing Your App with Spring Boot

Authentication Required

http://localhost:8080 requires a username and password.

User Name: greg

Password: **********
<table>
<thead>
<tr>
<th>Name</th>
<th>Image</th>
<th>Owner</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>bazinga.png</td>
<td>![Bazinga Image]</td>
<td>greg</td>
<td></td>
</tr>
<tr>
<td>B05771_MockupCover_Normal.png</td>
<td>![Mockup Cover Image]</td>
<td>phil</td>
<td></td>
</tr>
</tbody>
</table>

greg has [ROLE_ADMIN, ROLE_USER]

**Learning Spring Boot**
<table>
<thead>
<tr>
<th>Image</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Zinga" /></td>
<td>greg</td>
</tr>
<tr>
<td><img src="image2.png" alt="Learning Spring Boot" /></td>
<td>phil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Image</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Zinga" /></td>
<td>greg</td>
</tr>
<tr>
<td><img src="image2.png" alt="Learning Spring Boot" /></td>
<td>phil</td>
</tr>
</tbody>
</table>
### General
- **Request URL:** http://localhost:8080/images/bazinga.png/raw
- **Request Method:** GET
- **Status Code:** 200
- **Remote Address:** [::1]:8080

### Response Headers
- **Content-Type:** image/jpeg
- **Date:** Thu, 24 Nov 2016 06:18:44 GMT
- **Transfer-Encoding:** chunked
- **X-Application-Context:** chat:8080

### Request Headers
- **Accept:** image/webp, image/*,*/*;q=0.8
- **Accept-Encoding:** gzip, deflate, sdch, br
- **Accept-Language:** en-US,en;q=0.8
- **Authorization:** Basic Z3JlZzp0dXJucXVpc3Q=
- **Cache-Control:** no-cache
- **Connection:** keep-alive
- **Cookie:** SESSION=8ab12c94-dd78-438e-a483-b75e8f37629f
- **Host:** localhost:8080
- **Pragma:** no-cache
- **Referer:** http://localhost:8080/
- **User-Agent:** Mozilla/5.0 (Macintosh; Intel Mac OS X 10_11_5) Ap
Chapter 10: Taking Your App to Production with Spring Boot
# Learning Spring Boot - 2nd Edition

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Image</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>8d22f555-f830-4d38-aff0-4d11562013eb</td>
<td>B05771_MockupCover_Normal.png</td>
<td><img src="image1.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>37f6c64e-7be3-4bba-9e6d-82271822d4b4</td>
<td>bazinga.png</td>
<td><img src="image2.png" alt="Image" /></td>
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</tr>
<tr>
<td>d1459c17-e0f6-4a2a-82f9-b7243e47bab4</td>
<td>platform-spring-boot.png</td>
<td><img src="image3.png" alt="Image" /></td>
<td></td>
</tr>
</tbody>
</table>

**Choose File**  No file chosen

**Upload**
Greetings!

greg(channel): Wow! Are we really in production?
phil(channel): We sure are.

Cool. Can't wait to work on the next feature
Send