PROJECT RYVER BANK TEAM 10

```
[INFO] Results:
[INFO]
[INFO] Tests run: 28, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  14.297 s
[INFO] Finished at: 2020-11-03T02:36:12+08:00
[INFO] ------------------------------------------------------------------------
```

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WHY MICROSERVICES?

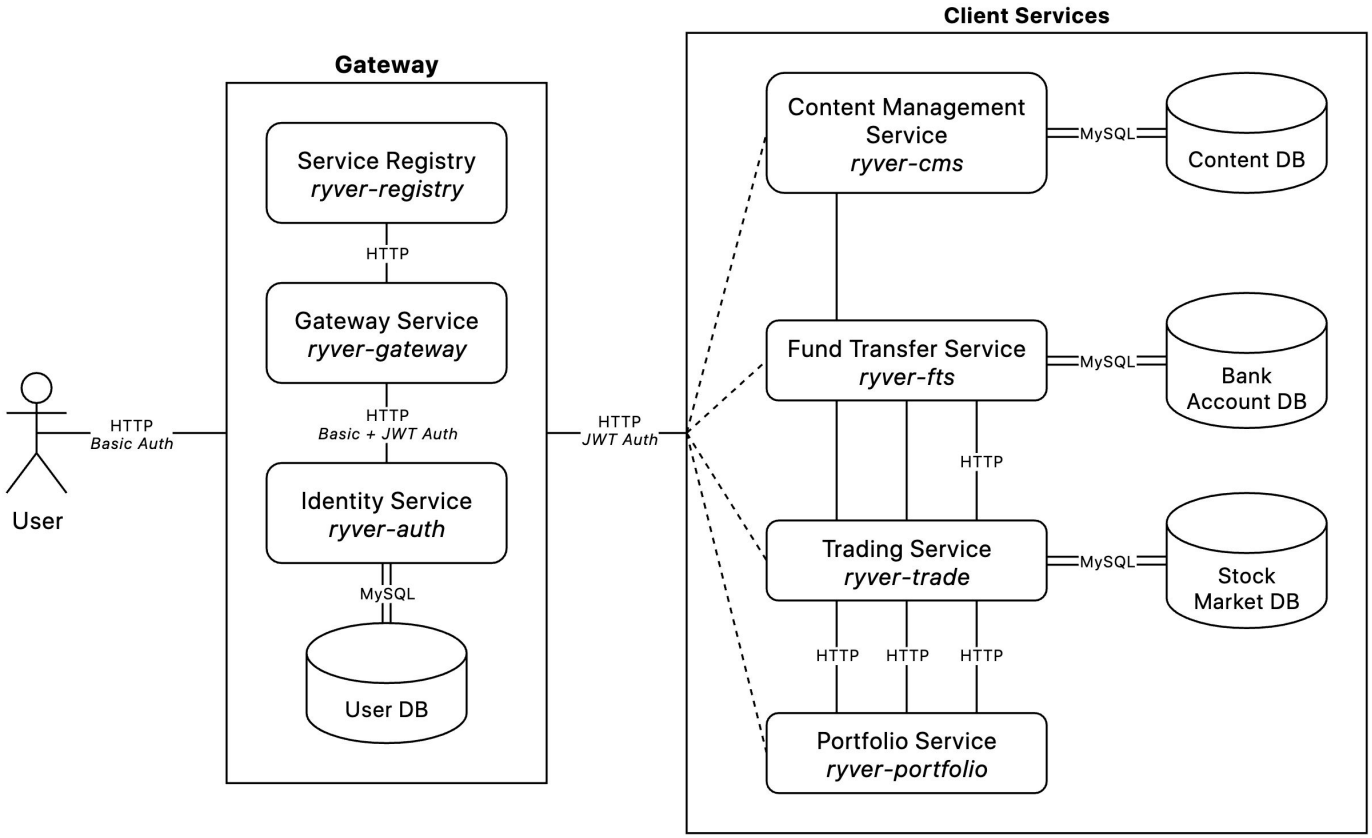
SEPARATION BETWEEN MODULES

- Improves maintainability of codebase
- Codebase for each service is smaller and more digestible - easier for developers to understand
- Able to test each service individually

SEMI-INDEPENDENT SERVICES

- If one service goes offline, it does not affect the availability of other services
- Each service can be easily redeployed in a modular fashion by a containerization service
- Individual services can be scaled up according to usage, and can be horizontally scaled by adding more instances

MICROSERVICE ARCHITECTURE



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JSON WEB TOKEN

To take advantage of a microservice architecture, we identified several key technical requirements.

- A token-based authentication architecture to minimise callbacks to the authentication service.
- A service registry architecture to coordinate the multiple services and instances.

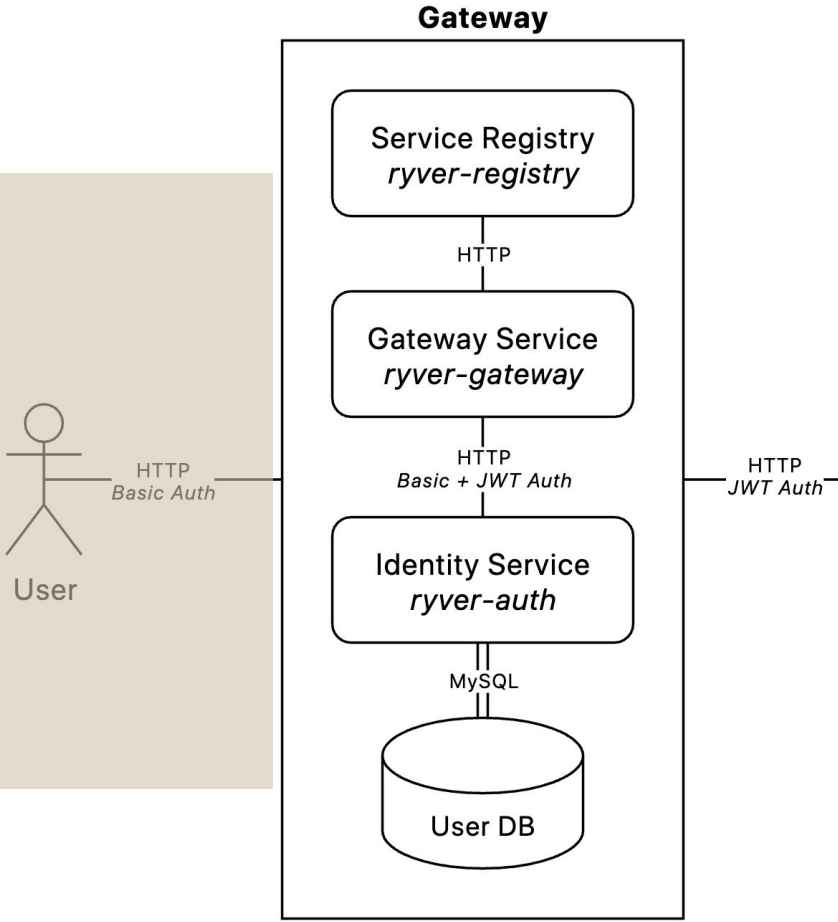
Based on the project requirements, our team decided to use a proxy to route incoming client requests to the appropriate service and transform Basic Authorization requests to use Bearer JWT tokens internally.

PROXY SERVICE

The client will access the API through a proxy, which is built upon three main components.

- Registry**:** Coordinates all client services in the system
- Auth: Stores user information & credentials. This allows authentication of incoming requests and checks user authorities
- Gateway: Handles Actual Routing of incoming client requests. This service communicates with Registry & Auth service to transform Basic Authorization requests into Bearer JWT Token Requests.

JWT Tokens are then parsed to the respectively services.



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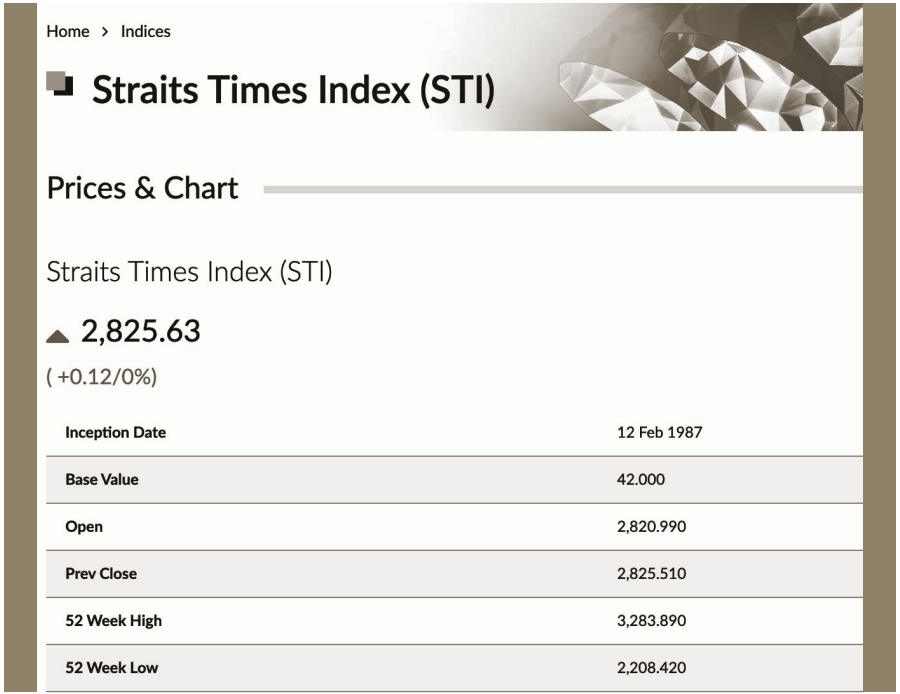
Stock Exchange



Web Crawling Service

Uses Selenium Java to load and crawl the website via a headless Chrome browser.

Pre-loaded CSV

Since we recognise that site crawling is prone to breaking, we also used a pre-loaded CSV as back-up.

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HTTPS

SSL Report: www.ryver.life (54.255.146.38)

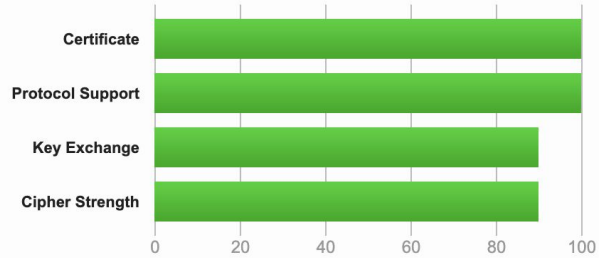
Assessed on: Tue, 03 Nov 2020 06:14:09 UTC | Clear cache

Scan Another »

Summary

Overall Rating

A



Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

This site works only in browsers with SNI support.

HTTPS

To receive an A rating for our SSL report, we had to ensure a few requirements:

1. Our certificates are strongly encrypted, trusted, and transparent.
2. HTTP requests are redirected to HTTPS.
3. We implemented support for TLS 1.2 with Secure Renegotiation and Forward Secrecy.

Hosted an Apache service, which acts as a proxy for our main Ryver API.

1. Separate our transport security and application concerns
2. Faster development of our application without worrying about handling SSL
3. Benefit from first-class security support

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Methodology

1. A customer's portfolio can be used as an indicator for the type of articles they would be interested in
2. Associate the types of stocks owned to the type of articles normally viewed

Implementation

Classify articles by their related stock option

Use a CountVectorizer to represent articles and a Logistic Regression model to classify articles probabilistically with a one-vs-rest scheme.

- *An artificial data set was used to train the model as a proof-of-concept.*

Integrate the recommendation microservice into the suite

Register the new microservice into the service registry.

- Use the registry to interact with other necessary services for customer information.

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Handling complexity...

In the complex market

Database: Handles data processing and filtering of best market or limit trade

Application: Handles complex market matching logic

In after-hour trading

Custom internal state tracks additional data required for after-hour trades without exposing to client.

Ensured atomicity of reconciliation via transactions.

Cron expressions and scheduling to manage opening and closing of market

In managing traffic

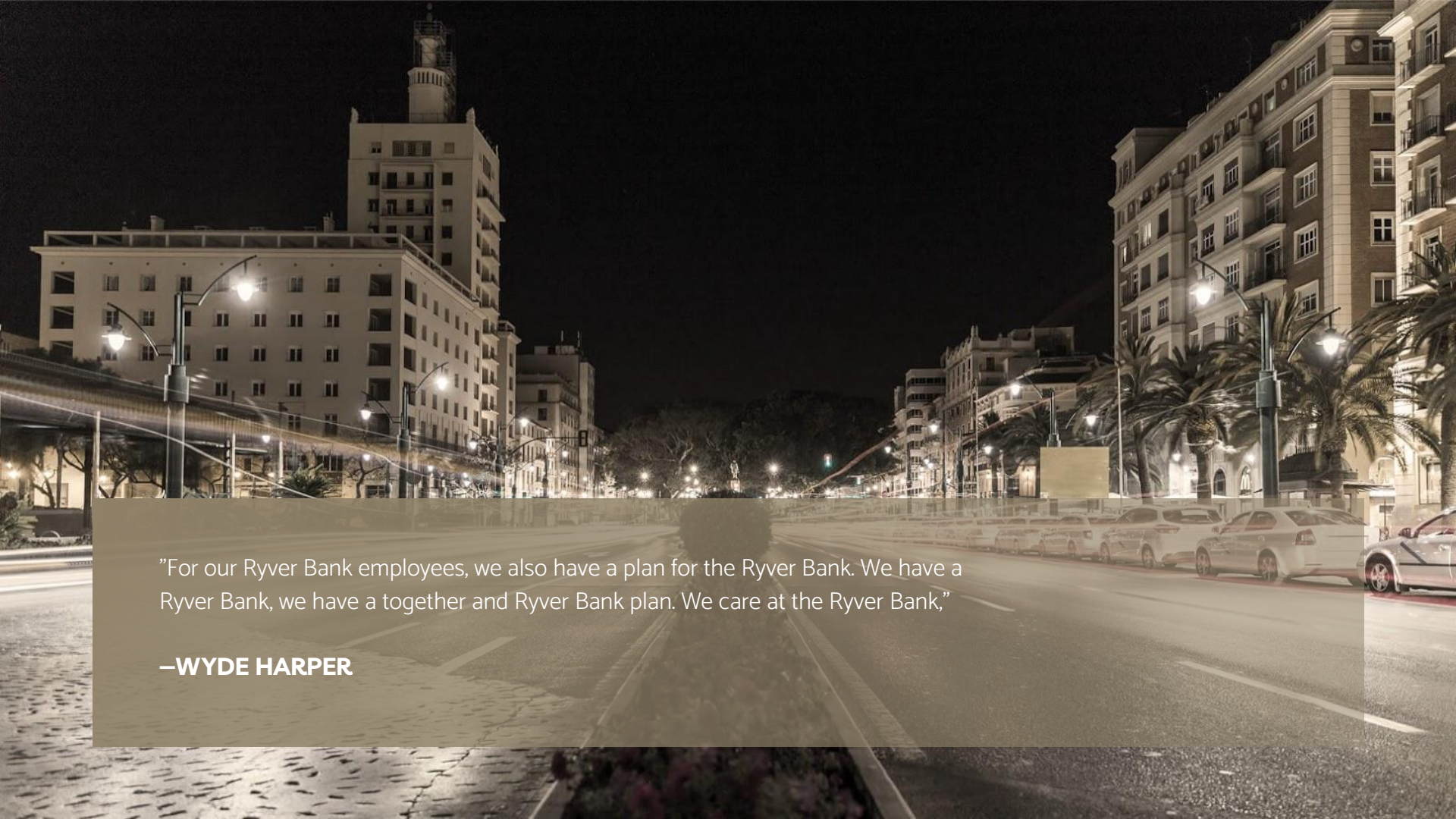
Gateway: handles external incoming requests and authentication

Internal market services: directly communicate with each other through a discovery client

In testing

Market reconciliation is complex.

Noteworthy corner cases include partial-filled trading, after-hours trade matching and appropriate stock-record updating.



”For our Ryver Bank employees, we also have a plan for the Ryver Bank. We have a Ryver Bank, we have a together and Ryver Bank plan. We care at the Ryver Bank,”

—WYDE HARPER

FUTURE

RYVER BANK

TEAM 10