



AGILE BANK

EVENT-DRIVEN ARCHITECTURE FOR BANKING SYSTEM IN DEVOPS

Owner of project

Binit Bhushan

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INTRODUCTION

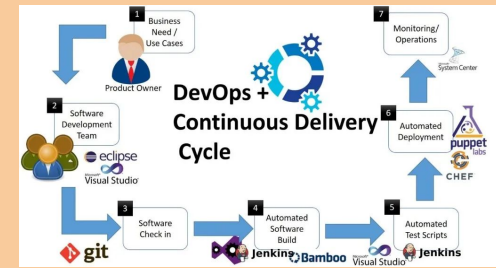
Introducing Agile Bank !

Welcome to the forefront of banking innovation. Agile Bank isn't just your average financial institution – we're here to redefine the way you experience banking. With a focus on agility, efficiency, and customer satisfaction, Agile Bank incorporates DevOps principles to drive continuous improvement and innovation. Our commitment to DevOps allows us to adapt quickly to market changes, streamline processes, and deliver exceptional banking services tailored to your needs. Join us as we embark on a journey to revolutionize the banking industry and empower our customers to achieve their financial goals with ease and confidence.





HOW BANK WORKS



How AgileBank Works:

- *Agile Development: Iterative approach for rapid product iteration and collaboration.*
- *Continuous Integration (CI): Automated code integration for early issue detection.*
- *Continuous Deployment (CD): Swift and consistent updates to production environments.*
- *Real-time Monitoring: Proactive tracking of system performance for seamless service.*
- *Customer Feedback Loop: Continuous gathering and utilization of customer insights for improvement*



PROBLEM STATEMENT



In today's banking landscape, traditional institutions face numerous challenges in meeting the evolving needs and expectations of customers in a rapidly digitizing world. These challenges include:

- 1. Legacy Systems: Outdated infrastructure and legacy systems hinder agility and innovation.*
- 2. Customer Expectations: Increasing demand for seamless digital experiences puts pressure on traditional banks to modernize.*
- 3. Security Concerns: Rising cyber threats require robust security measures to safeguard sensitive financial data.*
- 4. Competition: Fierce competition from fintech startups and digital banks necessitates differentiation and innovation.*



OBJECTIVE



To address these challenges, AgileBank sets the following objectives:

- *Modernization: Upgrade infrastructure and systems to enhance agility and innovation.*
- *Customer-Centricity: Prioritize customer experience by delivering seamless digital banking services.*
- *Security Enhancement: Implement robust security measures to protect customer data and prevent cyber threats.*
- *Innovation: Foster a culture of innovation to differentiate AgileBank in the competitive banking landscape.*



TECHNICAL IMPLEMENTATION

→ Agile Development Methodology:

Agile Bank adopts an Agile development methodology, such as Scrum or Kanban, to iteratively develop and deliver features in short cycles. This approach allows for flexibility, adaptability, and collaboration among cross-functional teams, ensuring alignment with customer needs and business objectives. To facilitate Agile project management and team collaboration, AgileBank utilizes Jira, a powerful tool that enables efficient backlog management, sprint planning, issue tracking, and real-time communication. With Jira, AgileBank empowers teams to stay organized, prioritize tasks effectively, and deliver high-quality software solutions that meet customer expectations.



TECHNICAL IMPLEMENTATION

Jeera Tool :-)



Jira Your work ▾ Projects ▾ Filters ▾ Dashboards ▾ Teams ▾ Plans ▾ Assets Apps ▾ Create

Q Search 🔔 ? ⚙️ BB

Agile banks
Software project

You're on the Free plan

UPGRADE

PLANNING

- Timeline
- Backlog
- Board
- Goals
- + Add view

DEVELOPMENT

- Code

You're in a team-managed project
[Learn more](#)

Projects / Agile banks

Timeline

Give feedback Share Export ...

Q BB SK

Status category ▾ Epic ▾ Label ▾ Type ▾

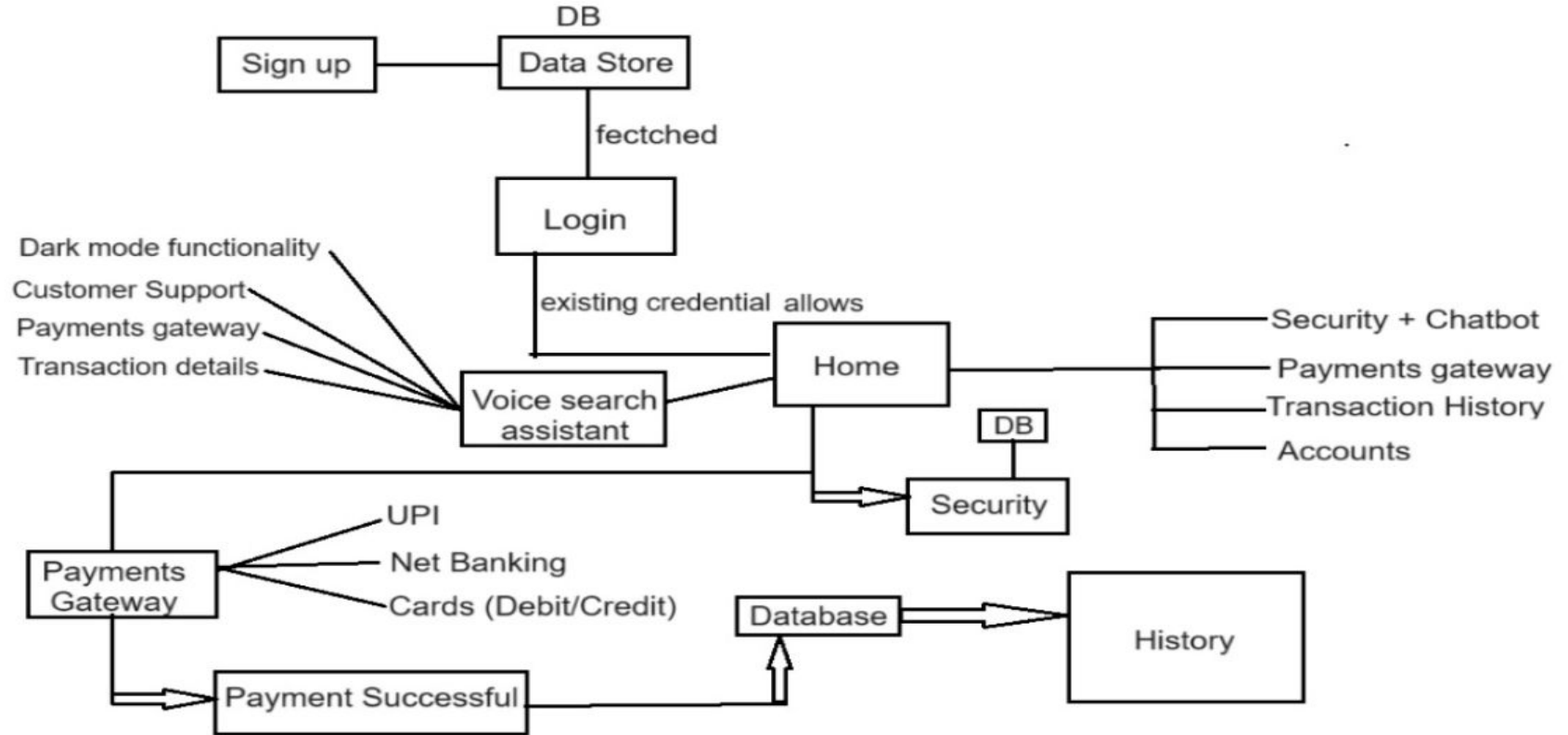
	FEB 8 9 10 11				FEB 12 13 14 15 16 17 18				FEB 19 20 21 22 23 24 25				FEB 26 27 28 29						
Sprints																			
> SCRUM-2 Account interface	[Blue bar]																		
+ Create Epic																			

Today Weeks Months Quarters ⓘ ↗

Outcome:

Project Plan					
Task Description	Start Date	End Date	Status	Issues Arised Date Issue details	Issues Resolved Date
Web Design Planning	01-15-2024	01-20-2024	Completed		
Web Development Setup	01/21/2024	01-25-2024	Completed		
Version Control IG system setuP	01-26-2024	01-30-2024	Completed		
H7ML/CSS Development	01-02-2024	02/15/2024 Basic Setup, Continuous Modifications throughout project as per requirements.	Completed	02-04-2024^	26-04-2024•
Jat'aScript Development	02/16/2024	02/20/2024 Basic Setup, Continuous Modifications throughout project as per requirements.	Completed		
Database Finalization	02/21/2024	02-25-2024	Completed		
Jenkins Pipeline Configuration	02-26-2024	03-05-2024	Completed		
Docker Environment Setup	06-03-2024	03-15-2024	Completed		
Docker Image Building	03-16-2024	03-25-2024	Completed		
Integration & Testing	03-26-2024	03-30-2024	Completed		
deployment & Finalization	04-01-2024	04-05-2024	Completed		

Working - Structure Of "THE AGILE BANK"





TECHNICAL IMPLEMENTATION

Web Application Development:

AgileBank develops a comprehensive web application to encompass all functions of a modern bank, including:

- Account Management: Allow customers to create and manage accounts, view balances, and perform transactions securely.
- Transaction Processing: Enable seamless processing of transactions, including transfers, payments, and bill payments, with real-time updates.
- Security Features: Implement multi-factor authentication, encryption, and access controls to ensure the security and integrity of customer data.
- Customer Support: Provide channels for customer support, including live chat, FAQs, and ticketing systems, to address inquiries and resolve issues promptly.
- Integration: Integrate with third-party services, such as payment gateways, credit bureaus, and regulatory compliance systems, to enhance functionality and compliance.



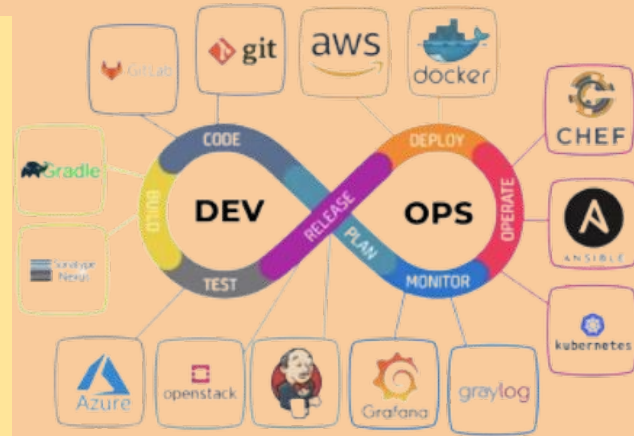


TECHNICAL IMPLEMENTATION

DevOps Tools:

AgileBank utilizes a robust suite of DevOps tools to enhance development, testing, deployment, and operations processes, including:

1. *Version Control: Git*
2. *CI/CD: Jenkins*
3. *IaC: Terraform*
4. *Containerization: Docker*
5. *Orchestration: Kubernetes*
6. *Monitoring and Logging: Jeera and Grafana*
7. *DataBase : DynamoDB(AWS)*





FINAL WORKS

world/AB

Wiki Security Insights Settings

AB

Public

Pin

Unwatch 1

Fork 0

Star 0

main 1 Branch 0 Tags

Go to file

Add file

Code

binitworld

Delete jenkins.yml ✓

a35bf43 · 2 hours ago

16 Commits

.github/workflows

Create jekyll-gh-pages.yml

11 hours ago

app

Banks -Final Deployment Binit

13 hours ago

backend

Banks -Final Deployment Binit

13 hours ago

Bank-ci.yml

Update Bank-ci.yml

2 hours ago

README.md

Initial commit

15 hours ago

README

AB

About

No description, website, or topics provided.

Readme

Activity

0 stars

1 watching

0 forks

Releases

No releases published

[Create a new release](#)

Packages

No packages published

[Publish your first package](#)

Deployments 21

github-pages

2 hours ago

[+ 20 deployments](#)

Languages

JavaScript 38.8%

HTML 23.1%

Python 2.0%

CSS 31.2%

Groovy 4.3%

Dockerfile 0.6%

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Jenkins PIPE LINES



Dashboard > Agile Bank > #2



Status



Changes



Console Output



Edit Build Information



Delete build '#2'



Git Build Data



Previous Build



#2 (May 1, 2024, 1:31:27 PM)



No changes.



Started by user [Binit Bhushan](#)

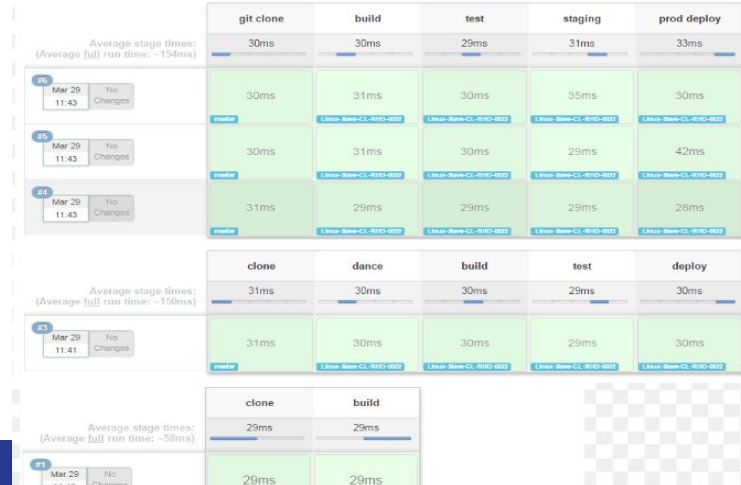


Revision: [a35bf43ad577280669ca7d07584ed4e79e5ea9b](#)
Repository: <https://github.com/binitworld/AB>

- origin/main

Console Output

```
Started by user Binit Bhushan
Running as Binit Bhushan
Building in workspace C:\ProgramData\jenkins\jenkins\workspace\Agile Bank
The recommended git tool is: git.exe
No credentials specified
> git.exe rev-parse --resolve-git-dir C:\ProgramData\jenkins\jenkins\workspace\Agile Bank\.git # timeout=10
Fetching changes from the remote git repository
> git.exe config remote.origin.url https://github.com/binitworld/AB # timeout=10
Fetching upstream changes from https://github.com/binitworld/AB
> git.exe --version # timeout=10
> git --version # 'git version 2.43.0.windows.1'
> git.exe fetch --tags --force --progress -- https://github.com/binitworld/AB refs/heads/*:refs/remotes/origin/* # timeout=10
> git.exe rev-parse 'origin/main' # timeout=10
Checking out Revision a35bf43ad577280669ca7d07584ed4e79e5ea9b (origin/main)
> git.exe config core.sparsecheckout # timeout=10
> git.exe checkout -f a35bf43ad577280669ca7d07584ed4e79e5ea9b # timeout=10
Commit message: "Delete Jenkins.yaml"
First time build. Skipping changelog.
Sending e-mails to: contact@binitbhushan@gmail.com
ERROR: Could not connect to host, port: localhost, 25; timeout: 60000
org.eclipse.angus.mail.util.MailConnectException: Could not connect to host, port: localhost, 25; timeout: 60000;
nested exception is:
java.net.ConnectException: Connection refused: no further information
at org.eclipse.angus.mail.smtp.SMTPTransport.openServer(SMTPTransport.java:1241)
at org.eclipse.angus.mail.smtp.SMTPTransport.protocolConnect(SMTPTransport.java:729)
at jakarta.mail.Service.connect(Service.java:186)
at jakarta.mail.Service.connect(Service.java:225)
at jakarta.mail.Service.connect(Service.java:174)
at jakarta.mail.Transport.send(Transport.java:132)
at jakarta.mail.Transport.send(Transport.java:182)
at hudson.tasks.MailSender.run(MailSender.java:131)
at hudson.tasks.MailSender.perform(MailSender.java:139)
at hudson.model.AbstractBuild$AbstractBuildExecution.perform(AbstractBuild.java:818)
at hudson.model.AbstractBuild$AbstractBuildExecution.performAllBuildSteps(AbstractBuild.java:767)
at hudson.model.AbstractBuild$AbstractBuildExecution.post2(AbstractBuild.java:179)
at hudson.model.AbstractBuild$AbstractBuildExecution.post(AbstractBuild.java:711)
at hudson.model.Run.execute(Run.java:1918)
at hudson.model.FreeStyleBuild.run(FreeStyleBuild.java:44)
at hudson.model.ResourceController.execute(ResourceController.java:181)
at hudson.model.Executor.run(Executor.java:442)
```



Terraform Works

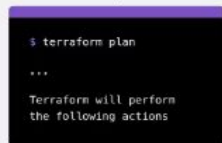
Write

Define infrastructure in configuration files



Plan

Review the changes
Terraform will make to your infrastructure



Apply

Terraform provisions your infrastructure and updates the state file.



```
PS E:\BSA\Banking System\src\app> terraform init
```

Initializing the backend...

Initializing provider plugins...

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see any changes that are required for your infrastructure. All Terraform commands should now work.

If you ever set or change modules or backend configuration for Terraform, rerun this command to reinitialize your working directory. If you forget, other commands will detect it and remind you to do so if necessary.

```
PS E:\BSA\Banking System\src\app> terraform plan
```

No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no differences, so no changes are needed.

```
PS E:\BSA\Banking System\src\app> terraform apply
```

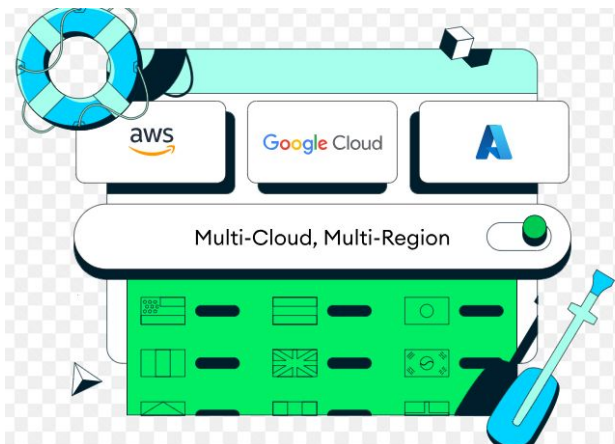
No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no differences, so no changes are needed.

Apply complete! Resources: 0 added, 0 changed, 0 destroyed.

```
PS E:\BSA\Banking System\src\app>
```

Mongo DB...



Atlas BINIT BHUSHAN'S... Access Manager Billing

Agile Bank Data Services App Services Charts

Overview DEPLOYMENT Database Data Lake SERVICES Device Sync Triggers Data API Data Federation Atlas Search Stream Processing Migration SECURITY Backup

VERSION 7.0.8 REGION AWS Mumbai (ap-south-1)

Cluster0

Overview Real Time Metrics Collections Atlas Search Performance Advisor Online Archive Cmd Line Tools

DATABASES: 5 COLLECTIONS: 16

+ Create Database

Search Namespaces

login_page

Singup Details payment payments securities users

login_page.users

STORAGE SIZE: 36KB LOGICAL DATA SIZE: 600B TOTAL DOCUMENTS: 6 INDEXES TOTAL SIZE: 36KB

Find Indexes Schema Anti-Patterns Aggregation Search Indexes

Generate queries from natural language in Compass

Filter Type a query: { field: 'value' }

QUERY RESULTS: 1-6 OF 6

```
{ "_id": "ObjectId('662be626f440d836f377e49d')", "name": "vinay", "email": "hello@gmail.com", "password": "hello", "__v": 0 }

{ "_id": "ObjectId('662be9014cc86775833a6768')", "name": "harshit", "email": "harshit@gmail.com", "password": "harshit", "__v": 0 }

{ "_id": "ObjectId('662be95e4cc86775833a6763')", "name": "harshit", "email": "pandey@gmail.com", "password": "pandey", "__v": 0 }

{ "_id": "ObjectId('662bedb24cc86775833a6767')", "name": "binit", "email": "binit@agilebank.com", "password": "binit", "__v": 0 }
```

login_page

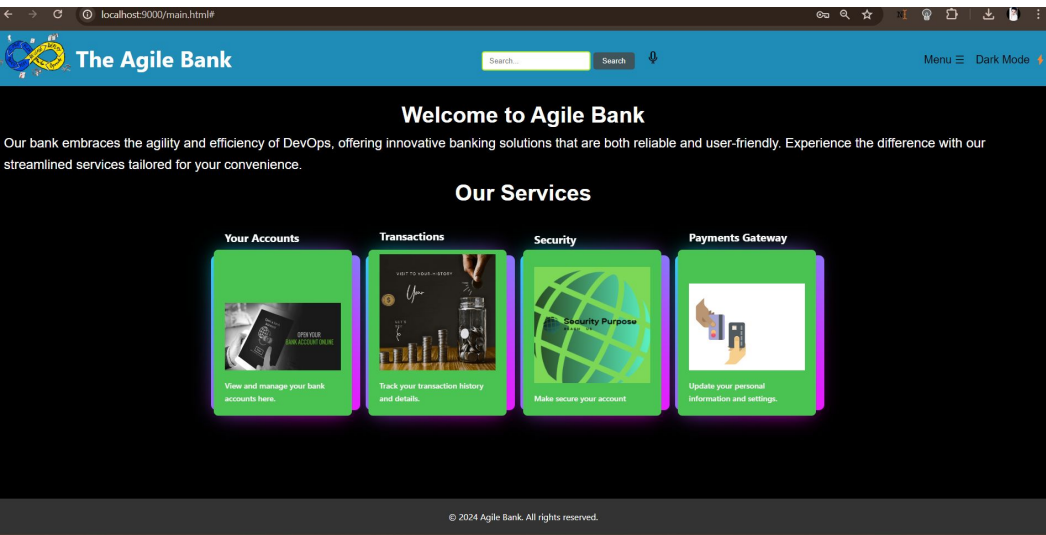
LOGICAL DATA SIZE: 3.79KB STORAGE SIZE: 16KB INDEX SIZE: 16KB TOTAL COLLECTIONS: 5

Collection Name	Documents	Logical Data Size	Avg Document Size	Storage Size	Indexes	Index Size	Avg Index Size
login_page	0	0B	0B	4KB	1	4KB	4KB
payments	0	0B	0B	4KB	1	4KB	4KB
users	22	2.49KB	122B	36KB	1	36KB	36KB
payments	3	556B	186B	36KB	1	36KB	36KB
users	6	600B	100B	36KB	1	36KB	36KB


CREATE COLLECTION

Dockerise / Deployments

```
E:\BSA\Banking System\src\app>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS
1e5fd73a987b   frontend      "/docker-entrypoint..." 17 hours ago   Up 17 hours   0.0.0.0:9000->80/tcp
9aef546028a0   backend       "docker-entrypoint.s..." 17 hours ago   Up 17 hours   0.0.0.0:5000->5000/tcp
```




Docker Hub / on for orchestration with docker-swarm

 Explore Repositories Organizations

Search Docker Hub ctrl+K ? B

Explore / binitworld/agilebank

**binitworld/agilebank** ☆0
By [binitworld](#) · Updated about 12 hours ago
Image

Manage Repository

↓ Pulls 7

Overview **Tags**

Sort by Newest Filter Tags

TAG

v0.2

Last pushed 12 hours ago by [binitworld](#)

Digest

[2e5f9c8f6893](#)

OS/ARCH

linux/amd64

Last pull

10 hours ago

Compressed Size

52.76 MB

```
docker pull binitworld/agilebank:v0.2
```

Copy

TAG

v0.1

Last pushed 12 hours ago by [binitworld](#)

Digest

[3244a321bafb](#)

OS/ARCH

linux/amd64

Last pull

8 hours ago

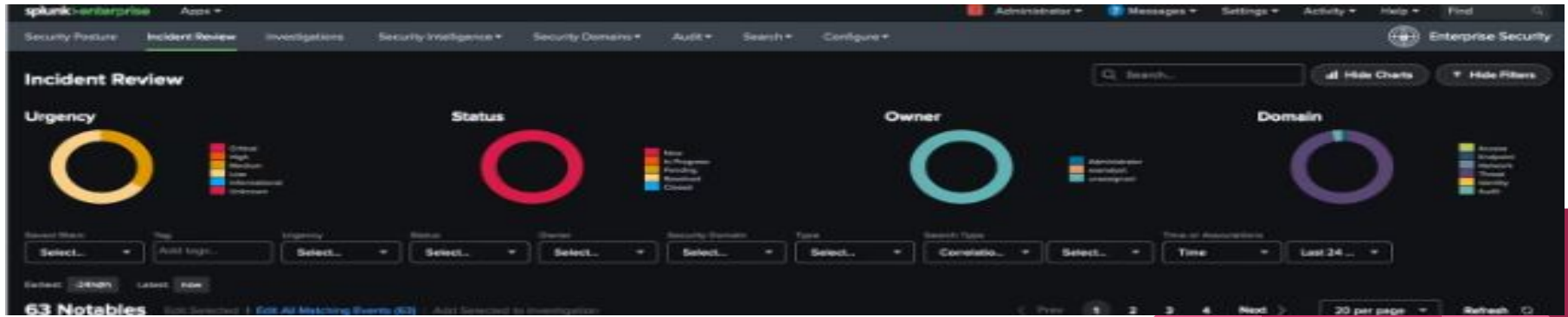
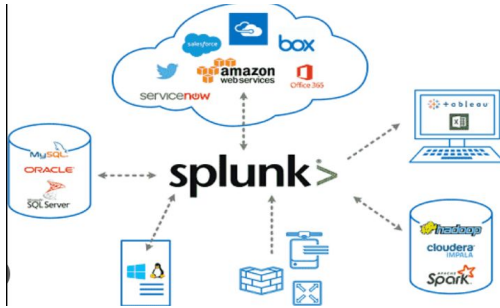
Compressed Size

89.58 MB

```
docker pull binitworld/agilebank:v0.1
```

Copy

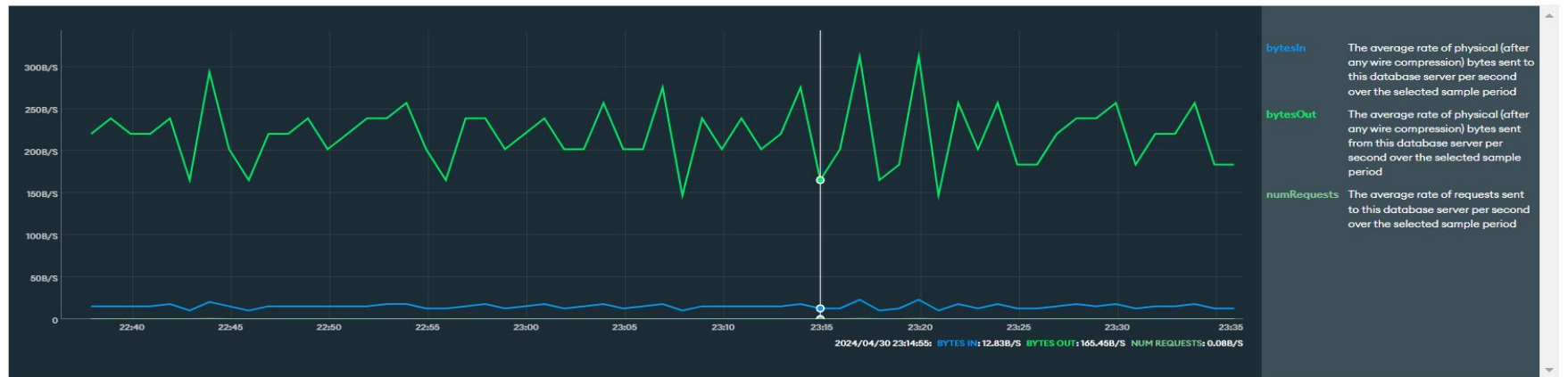
Continuous Monitoring ..



Continuous monitoring..

Some Insights of Monitoring.....

Network



Continuous Monitoring...



Continuous Monitoring:.....

Command



Insert





AREAS OF APPLICATION

1. *Retail Banking: Everyday banking activities like account management, payments, transfers, and bill payments for individual customers.*
2. *Corporate Banking: Financial services for businesses, including corporate accounts, loans, trade finance, and cash management.*
3. *Investment Banking: Securities trading, asset management, mergers and acquisitions, and corporate advisory services.*
4. *Wealth Management: Personalized financial planning, investment advisory, and portfolio management for high-net-worth individuals.*
5. *Digital Banking: Seamless web and mobile banking experiences for convenient access to banking services.*
6. *Regulatory Compliance: Ensuring compliance with KYC, AML, and GDPR regulations.*

SWOT ANALYSIS

Strengths:

- Robust DevOps practices
- Comprehensive web application
- Customer-centric approach
- Agile development methodology
- Modern technologies integration

Weaknesses:

- Dependence on third-party tools
- Initial investment and resources
- Resistance to change
- Staff training needs
- Cybersecurity risks



Opportunities:

- Market expansion
- Collaboration with fintech startups
- Introduction of new products/services
- Data analytics and AI utilization
- Regulatory partnerships

Threats:

- Competition
- Regulatory changes
- Technological obsolescence
- Economic downturns
- Reputation damage



CONCLUSION

AgileBank's implementation of DevOps principles and the development of its web application signify a pivotal move towards modernizing banking operations. With a focus on efficiency, scalability, and customer satisfaction, AgileBank is poised to excel in the dynamic banking landscape. By embracing agile methodologies and integrating modern technologies, AgileBank is well-positioned to meet evolving customer needs and maintain its competitive edge in the digital era.



REFERENCES

References:

- <https://talent500.co/blog/understanding-event-driven-architectures-in-devops/>
- <https://devops.com/how-event-driven-architectures-drive-real-time-operations/>
- <https://link.springer.com/article/10.1007/s10723-022-09624-z>
- <https://www.techtarget.com/searchitoperations/opinion/Use-event-driven-architecture-to-design-for-DevOps-20>

