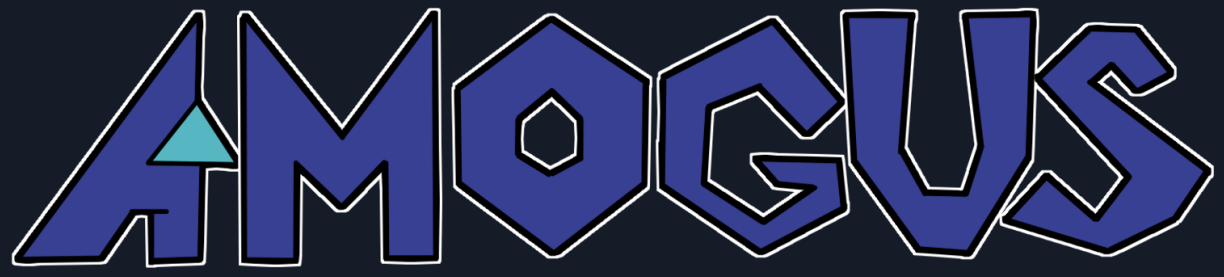
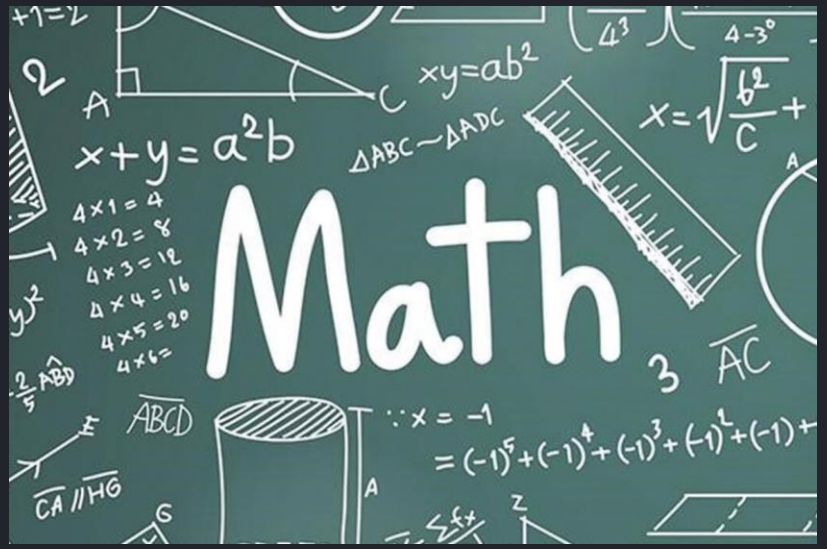


Advanced **M**athematic **O**perations & **G**eometrics **U**nder **S**tress

Project Goals and Visions

+



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/1.%20Requirements/Software%20Requirements%20Specification/

Project Goals and Visions

Math

Unique design

Selectable Category

Detailed Statistics

Exclusive teacher access

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/1.%20Requirements/Software%20Requirements%20Specification/

Architecture Decisions

Modifiability

Modularization

Increased Cohesion

Reduced Coupling

Chosen Technology

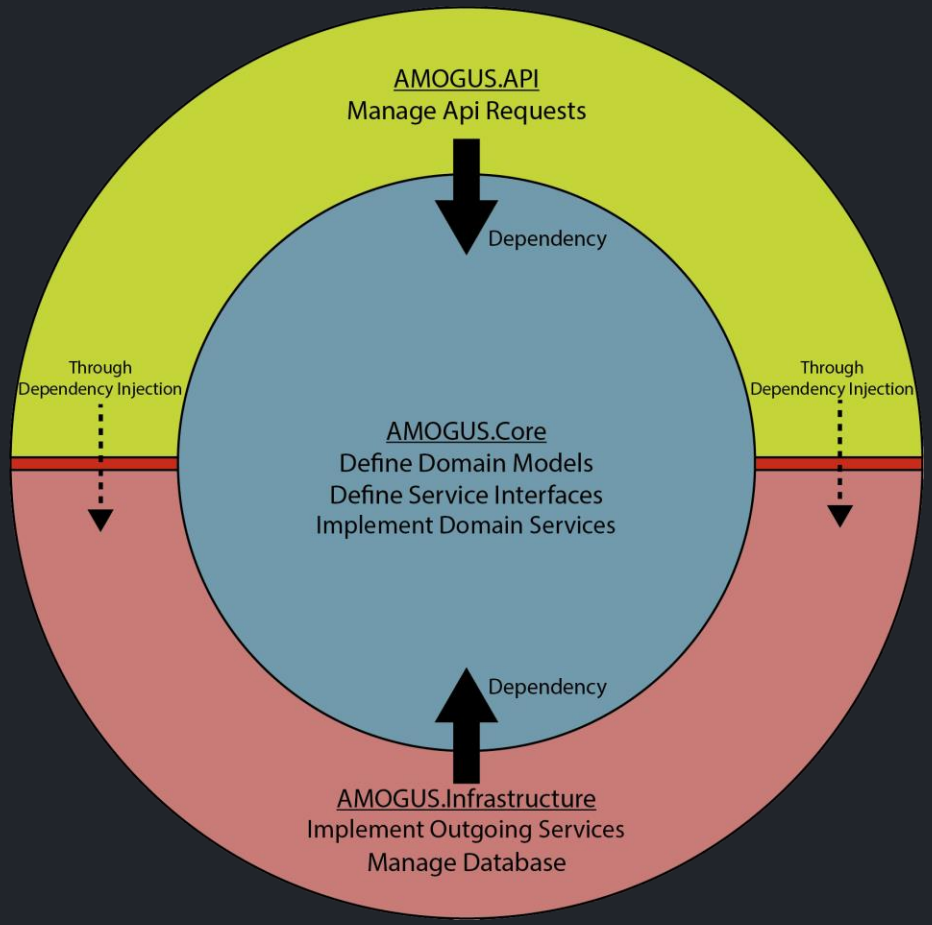
Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

Architecture Decisions

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

AMOGUS Basic Backend Architecture

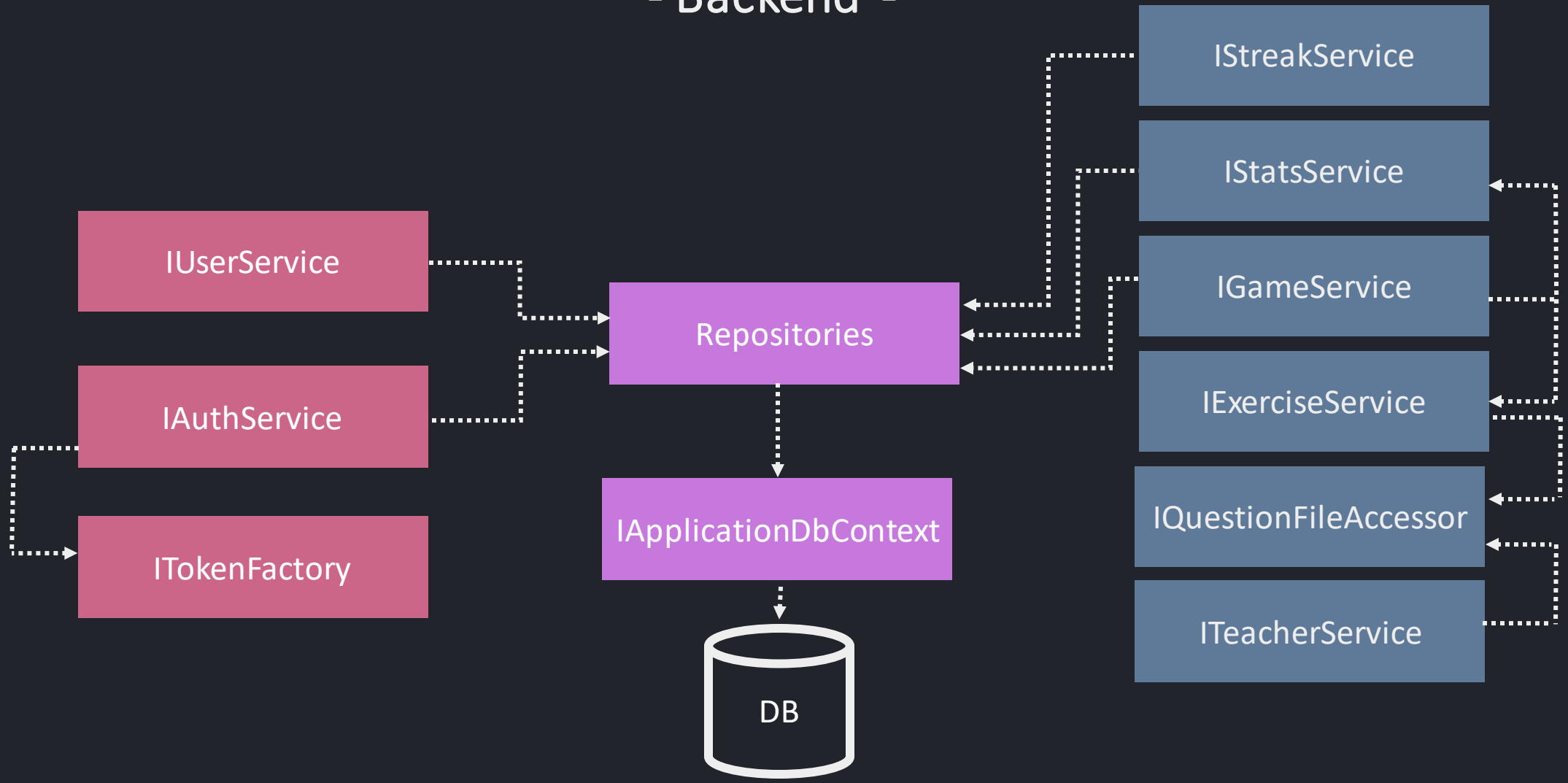
ABBA



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

Structure Of Services

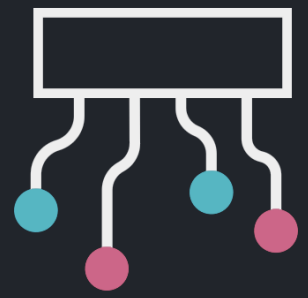
- Backend -



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

Architecture Decisions

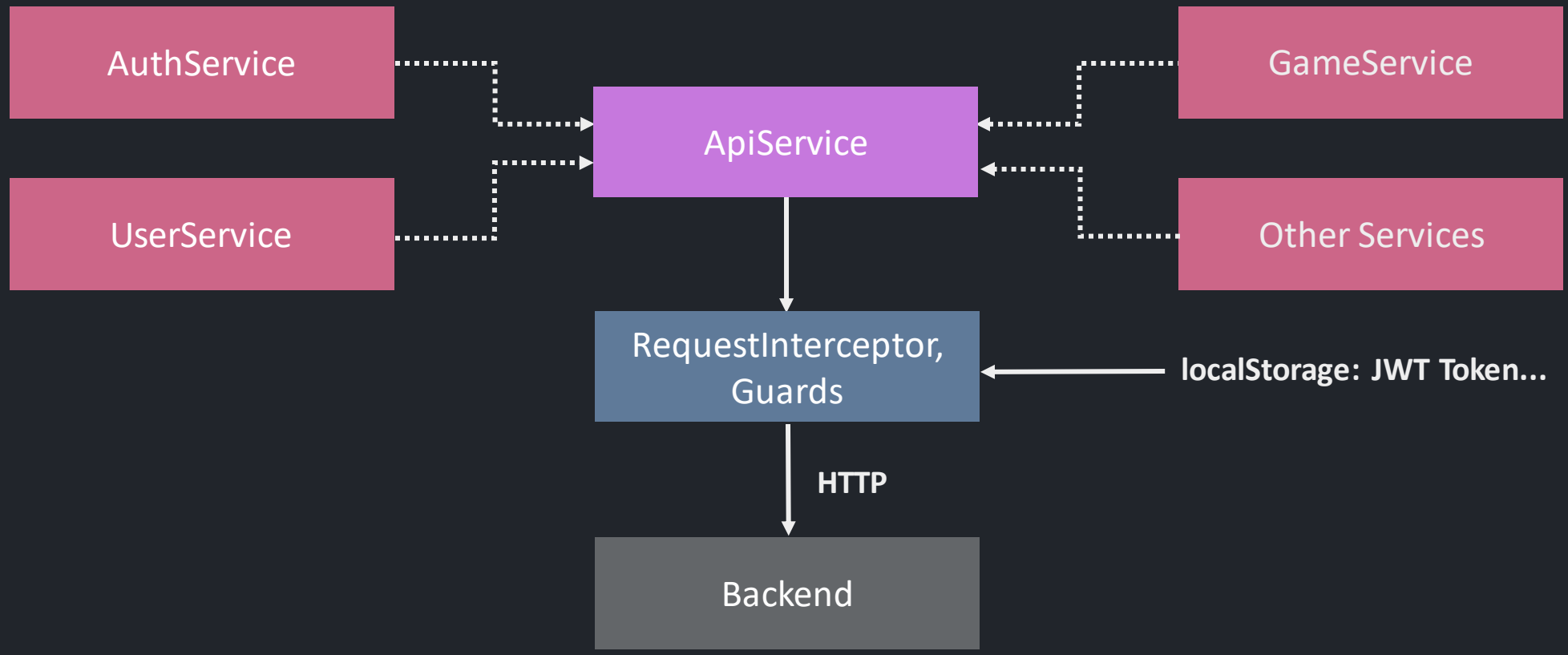
- Frontend -



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

Structure Of Services

- Frontend -



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/3.%20Architecture/Backend/ASR-AMOGUS/

Design Patterns

Dependency Inversion SOLID

- High-level modules should not import anything from low-level modules -> Depending on abstractions
- Abstractions should not depend on details

Factory Pattern

Creational pattern for objects

Repositoriy Pattern

Organization between domain layer and the data access layer

Singleton

Global class for data creation/access (single object of a class)

MVVM (Angular)

- Model View ViewModel
- Connection to C# Rest-Api
- modular and testable

MVC (ASP.NET)

Model View Controller

Tech Stack

Back-end	Database	Front-end	Project management	Blog	Deployment	Libraries
C#, ASP.Net Web API, Visual Studio 2022	Dev.: SQLite Prod.: MariaDB	Angular, Visual Studio Code	Jira, Discord, GitHub	GitHub Discussions	Docker, Ubuntu, GitHub Actions	xUnit, Moq, AnguriMath

Quality Assurance

Quality Assurance – Unit Testing

Frameworks:

- xUnit
- Moq

Executed on every merge-request:

GitHub Actions CI workflows

Coverage goal: 60%

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/4.%20Testing/zTest%20Report/

Quality Assurance – Unit Testing

Coverage goal: 60%

Actual coverage:

Summary

Sponsor Star

Information

Parser:	Cobertura
Assemblies:	3
Classes:	12
Files:	12
Coverage date:	14.05.2023 - 16:15:23

Line coverage

91%

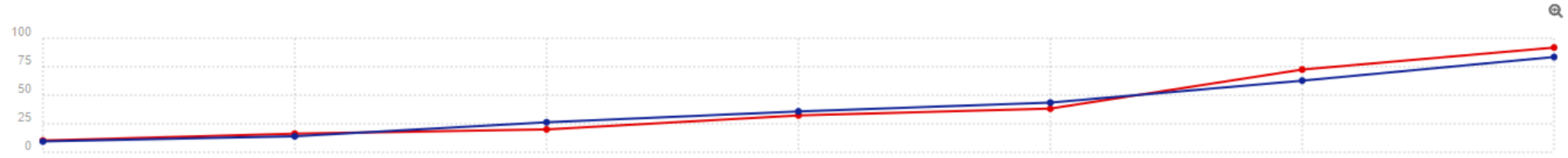
Covered lines:	431
Uncovered lines:	38
Coverable lines:	469
Total lines:	971
Line coverage:	91.8%

Branch coverage

83%

Covered branches:	117
Total branches:	140
Branch coverage:	83.5%

Coverage history



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/4.%20Testing/zTest%20Report/

Quality Assurance – Metrics highlights

- Source Code Complexity and Class Coupling (median of whole Project)

Code Complexity	Class Coupling
5	10

- Web Application Metrics (after optimizing images)

Landing Page

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/5.%20Metrics/Metrics/

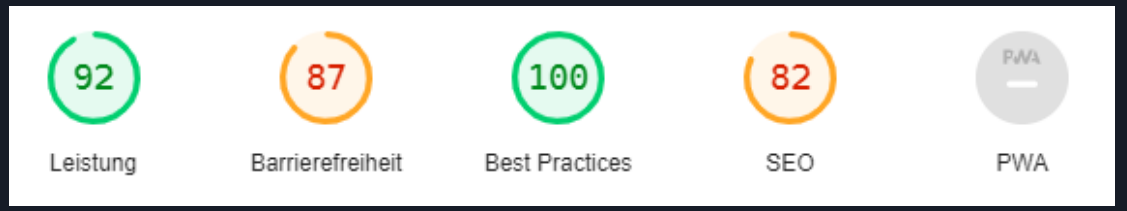
Quality Assurance – Metrics highlights

- Source Code Complexity and Class Coupling (median of whole Project)

Code Complexity	Class Coupling
5	10

- Web Application Metrics (after optimizing images)

Statistics Page



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/5.%20Metrics/Metrics/

Quality Assurance – Metrics highlights

- Source Code Complexity and Class Coupling (median of whole Project)

Code Complexity	Class Coupling
5	10

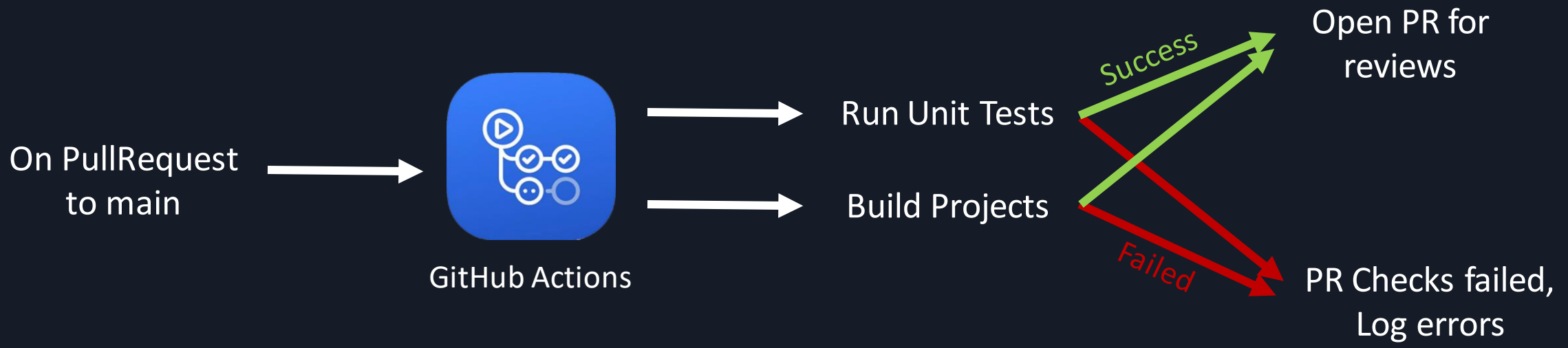
- Web Application Metrics (after optimizing images)

How-To-Play Page

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/5.%20Metrics/Metrics/

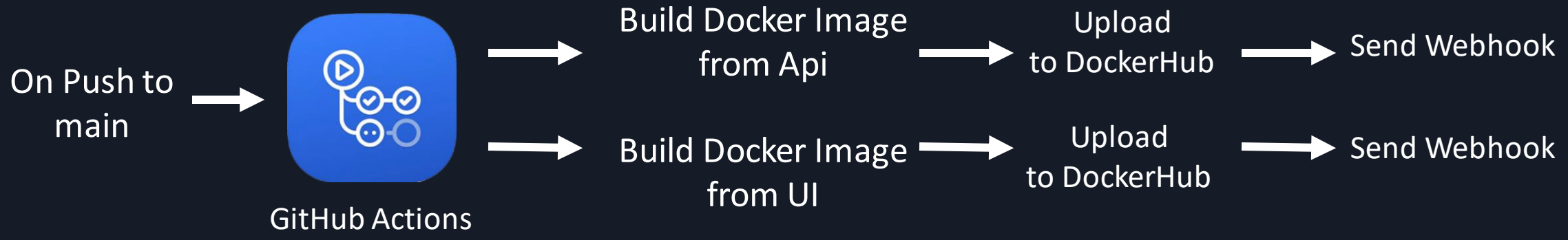
CI/CD

CI Workflows



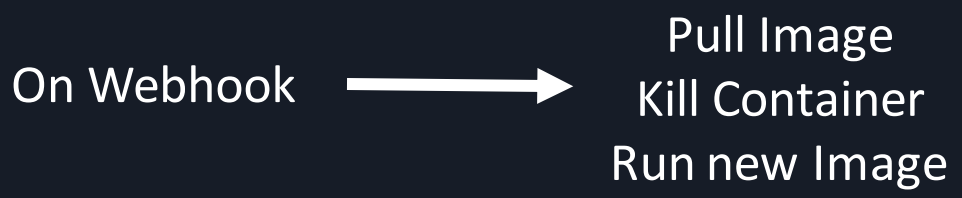
Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/6.%20CICD/CICDDoc/

CD Workflows



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/6.%20CICD/CICDDoc/

CD Workflows



Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/6.%20CICD/CICDDoc/

Live Demo

Lessons Learned

Lessons Learned – Technical Review

- Security is important, but not easy to achieve.
- Code can easily get complicated to understand.

  (clean code matters)
- External libraries can help to simplify the code.
- Add website source links to comments if needed.

Source: https://cumgroup.github.io/AMOGUS/Developer%20Docs/8.%20Review/technical_review/

Lessons Learned – Retro

- **Structure / Vision**: Don't lose the vision and keep a clear goal in mind.
- **Time management**: We overestimated the amount of time.
- **Communication**: Our online communication should be improved.
- **Weeklies**: It would have been beneficial to keep up weekly recaps.
- **PRs**: PRs should be smaller and processed faster in the future.

Source: https://github.com/CUMGroup/AMOGUS/discussions/141

Yours truly,

AMOGUS

stay sus