Security Report

Fontys University of Applied Science

Software

Project Plan Individual project:

Henaknowledge

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Introduction:

This document aims to show how Henaknowledge prevents OWASP Top 10 Vulnerabilities.

TOP 1: SQL Injection

Henaknowledge controllers receives data though Data transfer Objects which mimics what an entity class does, but created only for purpose of transfering the data. Typing in one of henaknowledge fields a SQL statement would not perform the SQL action since there are no direct connection between the controllers and the database layer at all.

TOP 2: Broken Authentication

Henaknowledge require a JWT for every request apart from authentication request. It requires the username and the password given in the request then Henaknowledge will send a JWT to the side that requested the authentication. Provided that JWT with BEARER before it is mantadory for every request.

TOP 3: Sensitive Data Exposure

Henaknowledge also uses BCryptPasswordEncoder to increase the difficulty of being hacked or in case of a hacked managed to obtain the database, the users are encrypted at least as last bearer before the hacker sees the information.

Along with the token being mandatory for every request, it makes it even difficult to get any data without it.

TOP 4: XML external entities

Henaknowledge uses Java classes as entities and does not use any external XML file as an entity. Henaknowledge has Model folder which contain all model classes with the annotation Entity.

TOP 5: Broken Access Control

Authentication and Authorization plays huge part in this. Henaknowledge requires clients to first authenticate via a post method providing an object that contains username and password. Then, Henaknowledge either returns the generated JWT if the user exists in the database or returns an error to the client. In case, of a successful authentication and that the username and password belongs to a STUDENT profile, then the generated JWT can NOT have access to ADMIN end points such as GET: “localhost:8080/Admin” to get all the available Admins. Whereas, a successful authentication of a user profile ADMIN will generate a JWT that is able to access all endpoints in the system.

TOP 6: Security Misconfiguration

In henaknowledge the security configuration are set to disable CSRF to prevent such attacks and configured to have no sessions, STATELESS so that every request apart from the ones that has been configured to be permitted to all users are mandatory to have BEAR JWT in the authorization in the headers of the request.

TOP 7: Cross-site scripting

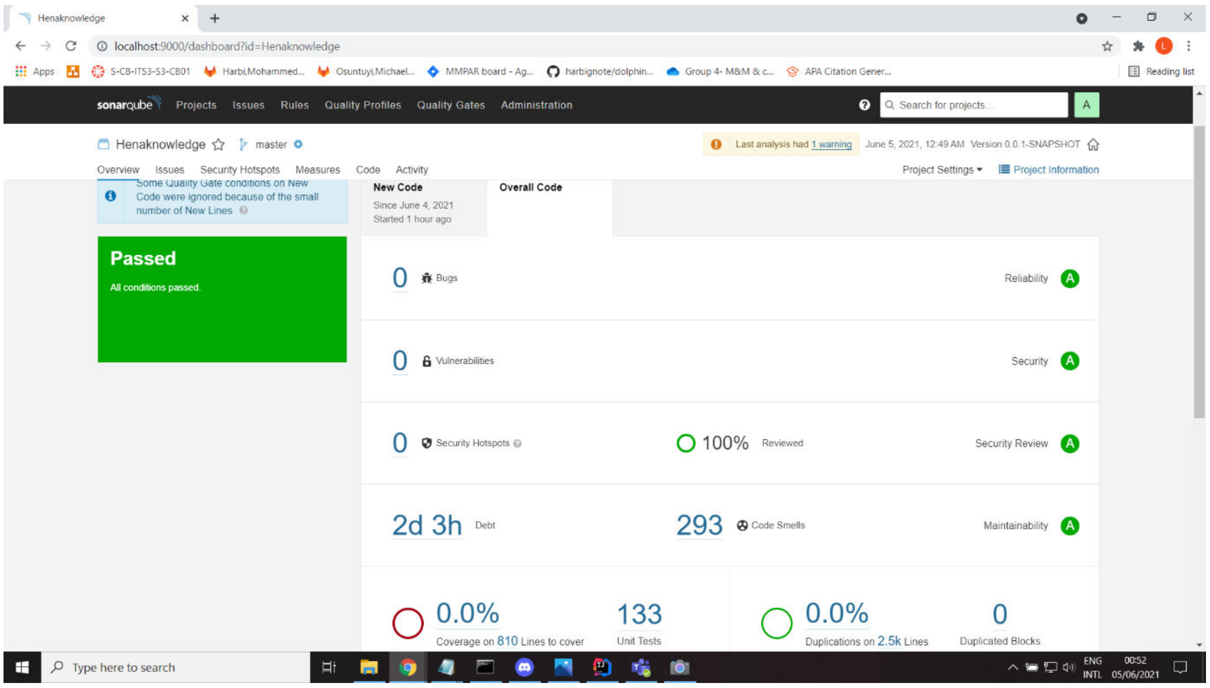
In Henaknowledge frontend it is not possible to retrieve information at all without being logged in. In addition to that only if you are logged in, you have a few privileges for instance as a Student, you can not retrieve admins information so on so forth. Thus, It is kind of hard to use the DOM to obtain data that the user has no privileges to access them.

TOP 8: Insecure Deserialization

Henaknowledge uses DTO as a way to get the data, then use them in the entity class that is connected to the database. Thus, having no deserialization meaning that this not a vulnerability and it cant be leveraged to obtain data.

TOP 9: Using Components with Known Vulnerabilities

This is the latest Henaknowledge version and it has 0 vunerabilities according to Sonarqube. Jocaco report is also available in the sprint 5 Document folder.

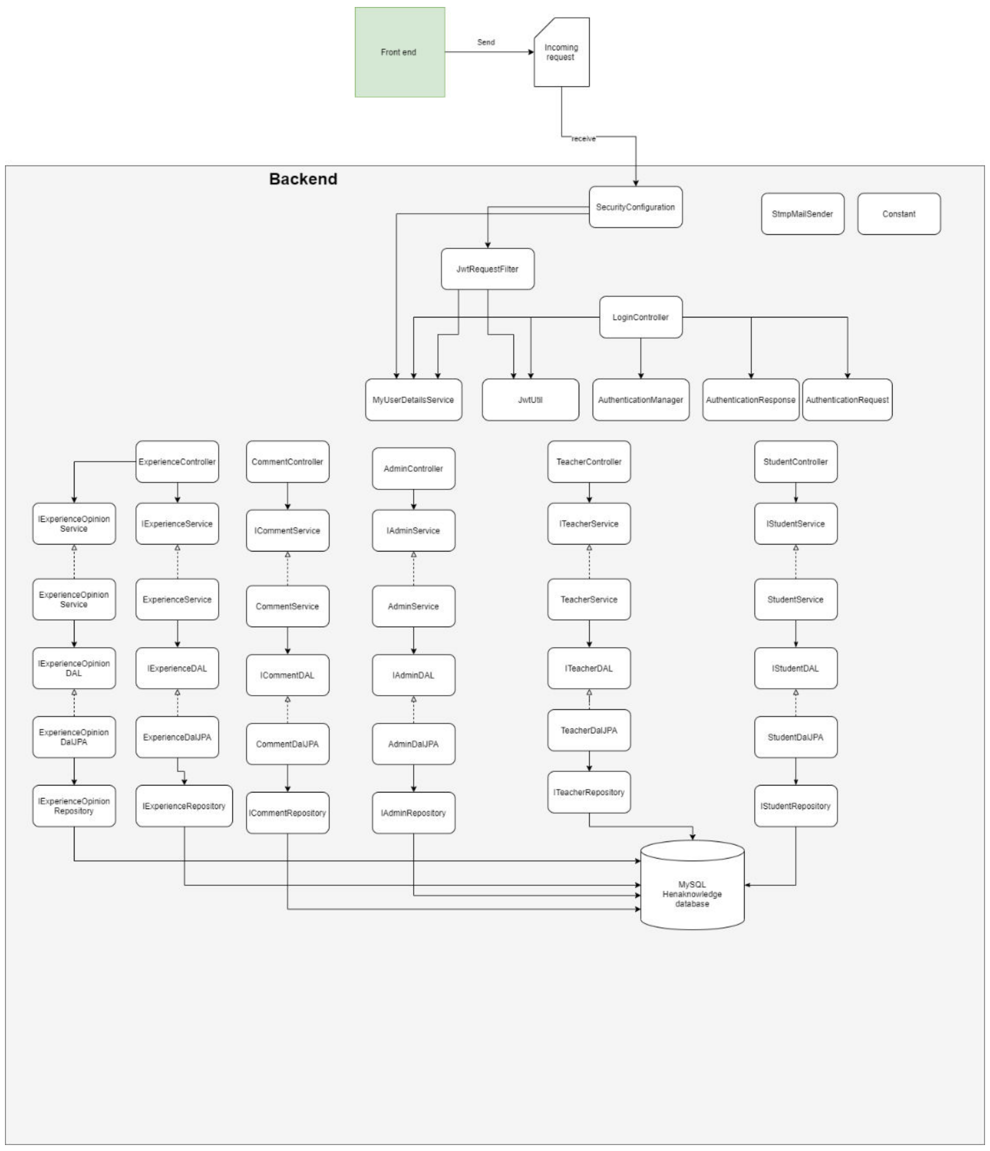


localhost:9000/dashboard?id=Henaknowledge
sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration
Henaknowledge master
Last analysis had 1 warning June 5, 2021, 12:49 AM Version 0.0.1-SNAPSHOT
Overview Issues Security Hotspots Measures Code Activity
Project Settings Project Information
Some Quality Gate conditions on New Code were ignored because of the small number of New Lines
New Code Since June 4, 2021 Started 1 hour ago
Overall Code
Passed
All conditions passed.
0 Bugs Reliability A
0 Vulnerabilities Security A
0 Security Hotspots 100% Reviewed Security Review A
2d 3h Debt 293 Code Smells Maintainability A
0.0% Coverage on 810 Lines to cover
133 Unit Tests
0.0% Duplications on 2.5k Lines
0 Duplicated Blocks

TOP 10: Insufficient Logging and Monitoring

Once a user tries to log in, the client side sends an authentication request and if the provided credentials does not match the database encrypted details the client side reserves an error which then are reflected in the frontend UI. Access-control in this case fails, server-side input validation fails as well.

Depency inject usage proof:


Front end
Send
Incoming request
receive
Backend
SecurityConfiguration
StmpMailSender
Constant
JwtRequestFilter
LoginController
MyUserDetailsService
JwtUtil
AuthenticationManager
AuthenticationResponse
AuthenticationRequest
ExperienceController
CommentController
AdminController
TeacherController
StudentController
IExperienceOpinion Service
IExperienceService
ICommentService
IAdminService
ITeacherService
IStudentService
ExperienceOpinion Service
ExperienceService
CommentService
AdminService
TeacherService
StudentService
IExperienceOpinion DAL
IExperienceDAL
ICommentDAL
IAdminDAL
ITeacherDAL
IStudentDAL
ExperienceOpinion DalJPA
ExperienceDalJPA
CommentDalJPA
AdminDalJPA
TeacherDalJPA
StudentDalJPA
IExperienceOpinion Repository
IExperienceRepository
ICommentRepository
IAdminRepository
ITeacherRepository
IStudentRepository
MySQL Henaknowledge database