

## **Secure Software Development Team Project**

### **Meeting Notes**

SecureSpace

**Date:** 07/05/2023

**Time:** 01:00 PM GMT

**Location:** Online, Google Meet

#### **Attendees:**

- Bradley Graham
- Rachel Doherty
- Tomas Miguel
- Michael Sammueller

### **Team Contract**

*The team met to discuss the contents of the team contract.*

- The team name was decided
- General team roles were identified
- The team contract was filled out
- All team members agreed on the contents of the contract
- All team members signed the contract

### **Unit 6 Assignment**

*The team discussed the requirements of the Unit 6 Assignment.*

- The team decided to choose the International Space Station as the domain for the assignment
- The team discussed the required research
- The team looked at source material about the selected domain

### **Actions**

*The following actions have been agreed upon:*

- Read the provided research material about the International Space Station
- Think about the assignment and potential solutions for it
- Gather information applicable to this assignment and the chosen domain

- Create a Slack channel to aid team collaboration

**Next Meeting:** The next meeting is scheduled for the 14th of May at 02:00 pm BST.

# Secure Software Development Team Project

## Meeting Notes

SecureSpace

**Date:** 14/05/2023

**Time:** 02:00 PM BST

**Location:** Online, Google Meet

### Attendees:

- Bradley Graham
- Rachel Doherty
- Tomas Mestanza
- Michael Sammueller

### Research, Data & Brainstorming

*The team discussed their research and data gathered throughout the week. The team also used this time to brainstorm about the final product. The following points were discussed during the meeting:*

- System architectures and system designs
- Databases (MySQL, SQL Lite) and backup databases
- Use of hashmaps and JSON files for storage
- Potential use of network architecture and distributed repositories
- Testing the application (Unit tests)
- Encryption algorithms
- UML diagrams to represent the system
- AGILE
- Various security vulnerabilities and attacks that could affect the system (turncoats, DDOS attacks, SQL injection)
- Failure tolerance and 'Arm & Fire approach'
- Asynchronous processes
- Minimal viable products
- Use of SSH connections or running several CLI concurrently
- Sockets
- Assigning roles with various privileges to users and restricting access to data whenever needed (for example, restricting the Russian mission control to data of Russian astronauts)

## **Decisions**

*The team agreed to the following:*

- The system's main purpose will be health monitoring. Astronauts will be able to log their vitals, radiation levels, and symptoms.
- The team will follow an agile approach, with a particular focus on the 'CRYSTAL CLEAR' methodology, as it suits smaller teams.
- Some form of data storage will be used.
- UML Use Case, Activity, and Sequence diagrams will be the most useful to represent the system.

## **Actions**

*The team agreed to the following actions. These actions shall be completed in preparation for the next meeting. Each team member has been assigned/volunteered for at least one task.*

- Connect 'Trello' to Slack for task tracking
- Create UML diagrams
- Research encryption algorithms
- Research asynchronous processes
- Research SQL databases in Python
- Research running two CLI sessions concurrently

*The team has agreed to contact each other on the Wednesday following this meeting for a quick progress report.*

**Next Meeting:** The next meeting is scheduled for the 21st of May at 02:00 PM BST.

# Secure Software Development Team Project

## Meeting Notes

SecureSpace

**Date:** 21/05/2023

**Time:** 02:00 PM BST

**Location:** Online, Google Meet

### Attendees:

- Bradley Graham
- Rachel Doherty
- Tomas Mestanza
- Michael Sammueller

### Research, Data & Brainstorming

*The team discussed their research and data gathered throughout the week, features of the software product, as well as security concerns and external libraries.*

- Hashlib vs bcrypt - The team discussed both libraries and decided to use the bcrypt library.
- The team discussed assumptions that will have to be mentioned within the design document (astronaut training, etc.).
- The team discussed threading and concurrency, potentially in the form of a timed cognition check.
- The team discussed databases.
- The team discussed how to interrupt Python "input()" statements.
- The team discussed implementing a voting system to ensure changes are agreed upon.
- The team discussed security vulnerabilities, concerns, and features.
- The team discussed distributed systems.

### Concurrency & Threading

*The team discussed concurrency and threading and how to implement them.*

- Timed inputs
- Cognition checks
- User logging
- A process running in the background that logs out the user if idle for too long.
- Download manager that continuously checks if files have been updated.

## **Databases**

*The team discussed databases and database features.*

- SQLite3
- JSON files
- Distributed databases and local repositories
- Backup databases
- Storing files or file paths in the database rather than raw text
- Logging user activity
- Separate database for passwords
- Limiting storage in the database
- Deleting data after a certain period of time or once a mission has ended
- “SELECT ... FOR UPDATE” statement in SQL to lock a row

## **Decisions**

*The team agreed to the following:*

- The system will use SQLite to store data.
- The system will use bcrypt, as recommended by OWASP, to encrypt passwords.
- The team will follow an object-oriented programming paradigm.
- The program will run on a central terminal rather than a network. Astronauts will have to download data and send it to mission control.

## **Actions**

*The team agreed to the following action(s). These actions shall be completed in preparation for the next meeting.*

- The team will collaborate on objects and methods for a UML Class diagram on Google Sheets.

**Next Meeting:** The next meeting is scheduled for the 28th of May at 02:00 PM BST.

# Secure Software Development Team Project

## Meeting Notes

SecureSpace

**Date:** 28/05/2023

**Time:** 02:00 PM BST

**Location:** Online, Google Meet

### Attendees:

- Rachel Doherty
- Tomas Mestanza
- Michael Sammueller
- Dr. Cathryn Peoples (Tutor)

### Research, Data & Brainstorming

*The team discussed libraries and external tools, databases, sensors, the design document, and classes.*

- System functionality
- Roles in the system (Astronaut, Admin, Superadmin)
- Admin would be in charge of the astronauts on their mission and be able to approve changes (data deletion etc.)
- Superadmin would be able to create user accounts, assign roles and privileges, as well as run SQL queries.
- Temperature/Radiation Sensor sending data to the application to demonstrate threading and concurrency. (Dr. Peoples suggested that this data would not necessarily have to be stored.)
- The team still wants to use SQLite3, but we are aware that we may need to use a different database if certain features are added (e.g. concurrent users)

### Decisions

*The team preliminarily agreed to the following (pending approval/vote from Brad):*

- We will implement sensors (temperature/radiation) to demonstrate threading and concurrency, as suggested by Dr. Peoples.
- The system roles will be Astronaut, Admin (Observer/Moderator), and Superadmin.
- We will add a Sensor, Role, and Permission Class to the diagram.
- Superadmins will issue user accounts with a temporary password, which will have to be changed upon initial login.
- The system will be built with a microservice architecture in mind, so parts of the program can be altered without affecting the overall system.

- We will use bcrypt (as recommended by OWASP), although NASA demands NSA-approved algorithms (as approved by Dr. Peoples, the reasoning being that NSA data is currently behind a paywall.)
- We will map our project against OWASP requirements
- Meetings will be recorded from now on via screen record, as it is valuable ePortfolio evidence (as recommended by Dr. Peoples).

### **Actions**

*The team agreed to the following action(s). These actions shall be completed in preparation for the next meeting.*

- The team will continue to collaborate on the Classes, Attributes, and Methods.
- The team will research whether SQLite3 databases can be encrypted.
- All existing UML diagrams will be updated.

**Next Meeting:** The next meeting is scheduled for the 4th of June at 02:00 PM BST. There may be an additional meeting on Friday, the 2nd of June, to work on the final draft of the design document.



## Secure Software Development Team Project

### Meeting Notes

SecureSpace

**Date:** 02/06/2023

**Time:** 10:00 AM BST

**Location:** Online, Zoom

#### Attendees:

- Bradley Graham
- Rachel Doherty
- Tomas Mestanza
- Michael Sammueller

### Research, Data & Brainstorming

*The team held a pre-finalisation meeting to discuss aspects of the diagrams and the design document. The team also clarified and discussed software features.*

- Database encryption:
  - The 'pysqlicipher3' library is too complicated to install, possibly affecting the overall deployability of the software; hence it will not be used.
  - The 'cryptography' library would allow us to encrypt the data instead of the database, which theoretically improves the performance of the system while still providing an additional layer of security. The 'cryptography' library is frequently updated (Last update: 01/06/2023), which makes it a great candidate.
- Sensors:
  - Temperature sensor, which continuously monitors the temperature inside the ISS. If the temperature exceeds a predefined maximum, the system will alert the user.
  - These warnings could be stored in a queue, which will be continuously monitored for new warnings.
  - The team discussed using a concurrent threading approach to implement the Sensors.
- Roles:
  - A Role object will store information about the role & would allow for methods from the "CommonActions" Class to be matched to each specific role.
  - Each role will have to have a separate account. A "Superadmin" would require an "Astronaut" account to enter health records.
  - To provide an additional layer of security to the "Superadmin" role, the team discussed implementing a "PIN" code. A "Superadmin" would have to log in with their username, password, and the "PIN" code to gain access to their account.
- Design Document:

- GDPR - The team discussed reducing the amount of text in this section and including assumptions (such as that the astronauts will be briefed about data storage and that they will have to agree to a privacy policy prior to deploying to the ISS).
- UML Diagrams:
  - UML diagrams - The team discussed trimming the use case diagram and potentially removing any mention of security capability from the diagram. Alternatively, mentions of the security capability will be reduced to what would be beneficial knowledge for stakeholders.
  - “Application” should be removed as an actor from the “Use Case” diagram and instead be assigned as the title of the box encompassing the diagram.
  - The team discussed adding “Database” as an actor to the diagram
  - The team discussed using UML Misuse Case Diagrams to display both the use cases and to model security features
  - The team discussed updating the UML Activity Diagram.
  - The team discussed connecting “CommonActions” to “CommandLine” in the Class diagram.
  - “Logger”, “Auditor”, “Sensor”, “Role”, and “Permission” classes will be added to the Class diagram.
  - The “Authentication” Class is to be renamed to “Login”.
  - “Role” to be removed from the “User” Class.

## **Actions**

*The team agreed to the following action(s). These actions shall be completed in preparation for the next meeting.*

- Reduce the word count of the design document and apply changes discussed in the meeting - Rachel
- Update UML Activity Diagram - Brad
- Update UML Use Case Diagram - Tomas
- Update UML Class Diagram - Michael

**Next Meeting:** The next meeting is scheduled for the 4th of June at 02:00 PM BST

## Secure Software Development Team Project

### Meeting Notes

SecureSpace

**Date:** 04/06/2023

**Time:** 02:00 PM BST

**Location:** Online, Zoom

#### Attendees:

- Bradley Graham
- Rachel Doherty
- Tomas Mestanza
- Michael Sammueller

#### Overall Discussion

*This team meeting was dedicated to finishing the final draft of the design document, including all UML diagrams. The team discussed the following aspects while working on the final draft:*

- Diagrams
  - Attributes and methods for the classes of the UML Class Diagram
  - Adding "Astronaut", "Moderator", "Superadmin" to the UML Class Diagram to show inheritance between the "Role" class and these individual classes.
  - Adding "Thermometer" and "Radiation Monitor" to the UML Class Diagram to show inheritance between the "Sensor" class and these two classes.
  - Connecting the "Process Sensor Data" use case to the "User" actor in the UML Use Case Diagram.
- Logging
  - The team discussed adding "Severity", "Activity", "Category", "Date", "I.D.", and "Data" to the logs.
  - The team discussed storing logs in a file rather than in a database.
  - The team discussed the functionality of the "Auditor" class.

#### Actions

*The team agreed to finalise the changes to the diagrams and the design document and send the final draft to the tutor for feedback. The team will wait for the feedback before meeting again to discuss further actions.*

**Next Meeting:** The next meeting is scheduled for the 11th of June at 02:00 PM BST.