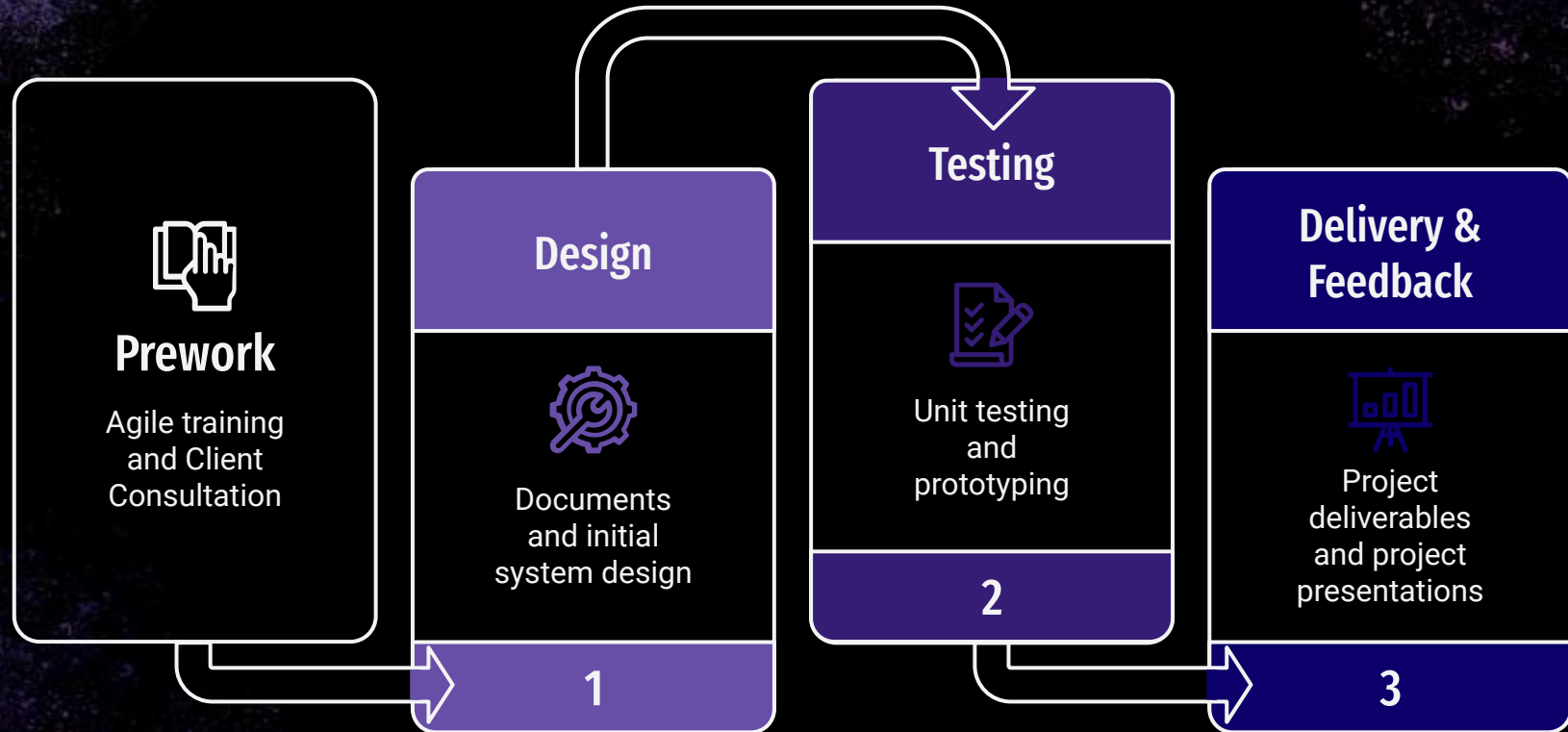




# DATA STORE

Jennifer Olszyna, Kayla Jamar, Claire Hall, Baxter Halder

# Process Model



# Tools

- ❑ Development Tools
  - ❑ Microsoft Windows Operating System
  - ❑ Linux Operating System Terminal
- ❑ COTS and FOSS tools
  - ❑ XAMPP - Free open source server provides environment for MySQL
  - ❑ MySQL - relational database management software
  - ❑ MariaDB - supported fork of the MySQL relational database management system

# Project Schedule

Phase	Task	Due Date
Design	Client Consultation	2/11
	Initial draft of documents	2/16
	Revision of documents	2/23
	Final draft SRS & SDMPs	3/02
	Initial design review	3/09
Testing	Implementation begins	3/16
	Initial testing	3/23
	Testing Phase 1	4/06
	Testing Phase 2	4/13
	Testing Phase 3	4/20
	Integration and Acceptance Testing	4/27
Deliver	Software delivery & Team presentations	5/3

# Risks

**Process Risk Management** - Risks arising from improper implementation

Risk	Description	Mitigation Strategy
Semantic Risks	Data is mis-stored in wrong field	Data migration testing
Extended DownTime Risk	Data transfer from Engine is delayed	Alert Engine and attempt to retry transfer

# Risks

**Programmatic Risk Management** - Risks related to scheduling, available resources, and mismanagement

Risk	Description	Mitigation Strategy
Inadequate Knowledge	Members are completely unaware of, or unfamiliar with SQL	Require all members are trained in SQL; if member not familiar they must go through a crash course



# Risks

**Technical Risk Management** - Risks relating to the quality, security, and/or performance of the software

Risk	Description	Mitigation Strategy
Data Corruption	Errors in data that occur during transfer or storage of the data	Utilize the log files of SQL Server to restore the database
Data Loss	Incomplete data transfer or unexplained loss of data	Data migration, reconciliation testing in instance of system errors or detected loss
Data Leakage	Loss of sensitive information	Implement a password security
Inadequate Space	Data amount exceeds allocated database storage	Alert Dashboard at the ninety-five percent storage capacity
Interference Risk	Multiple users attempt to access database simultaneously	Data store will limit concurrent assesses

# Training

- ❑ Main training sources are courses of UNA's CS program.
  - ❑ Methods and management of software development
  - ❑ Software architecture
  - ❑ Analysis of software artifacts
  - ❑ Models in software development
  - ❑ Database system (UNA optional course)

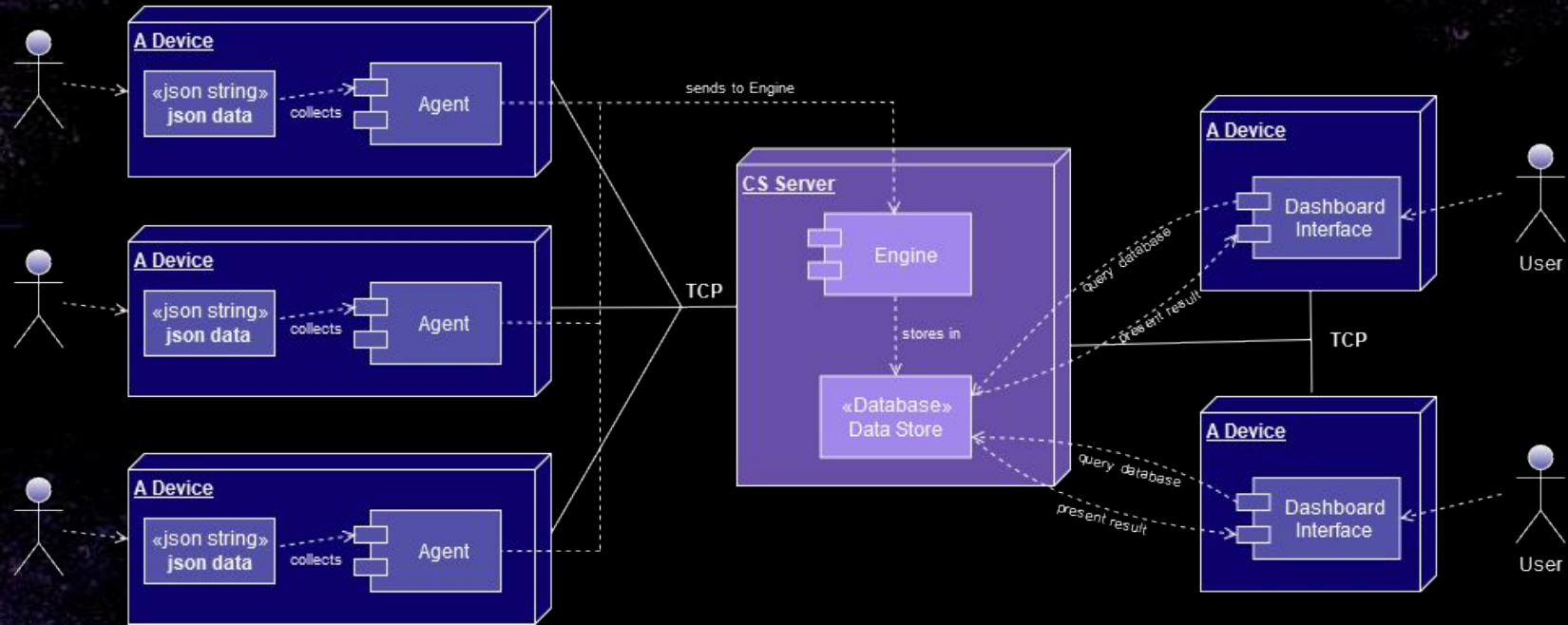
Training	Description	Member(s)	Date
Basic SQL	Basic of SQL Scripts	All	12/07/21
Basic Database Training	Theories and application of database systems	All	12/07/21
Secure Coding Training	Basics of secure coding standards set by SEI CERT	All	2/16/22



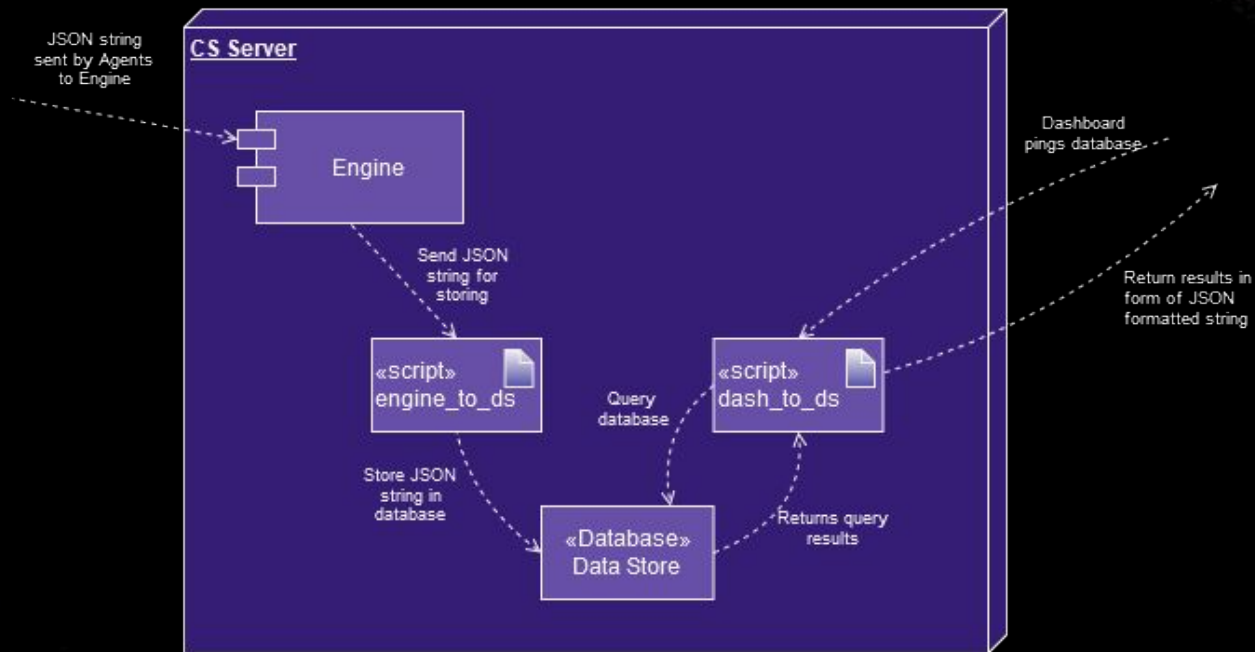
# Configuration Management

- ❑ Purpose: Identify, organize, and control software/hardware configuration changes
- ❑ CM Resources:
  - ❑ Overleaf LaTeX - documentation
  - ❑ Discord - communication between teams
- ❑ Change Control Procedures:
  - ❑ Notes taken at weekly meetings documenting the time and topic discussions

# Software Overview



# Software Overview



# Major Requirements

## Aspect 1

Connect to and read in data  
from Engine

- SR01

## Aspect 2

Connect to and  
communicate with Dash

- SR02, SR06

## Aspect 3

Users can view metrics from  
Dash

- SR13, SR14, SR15,  
SR16, SR17

## Aspect 4

Data Store is scalable

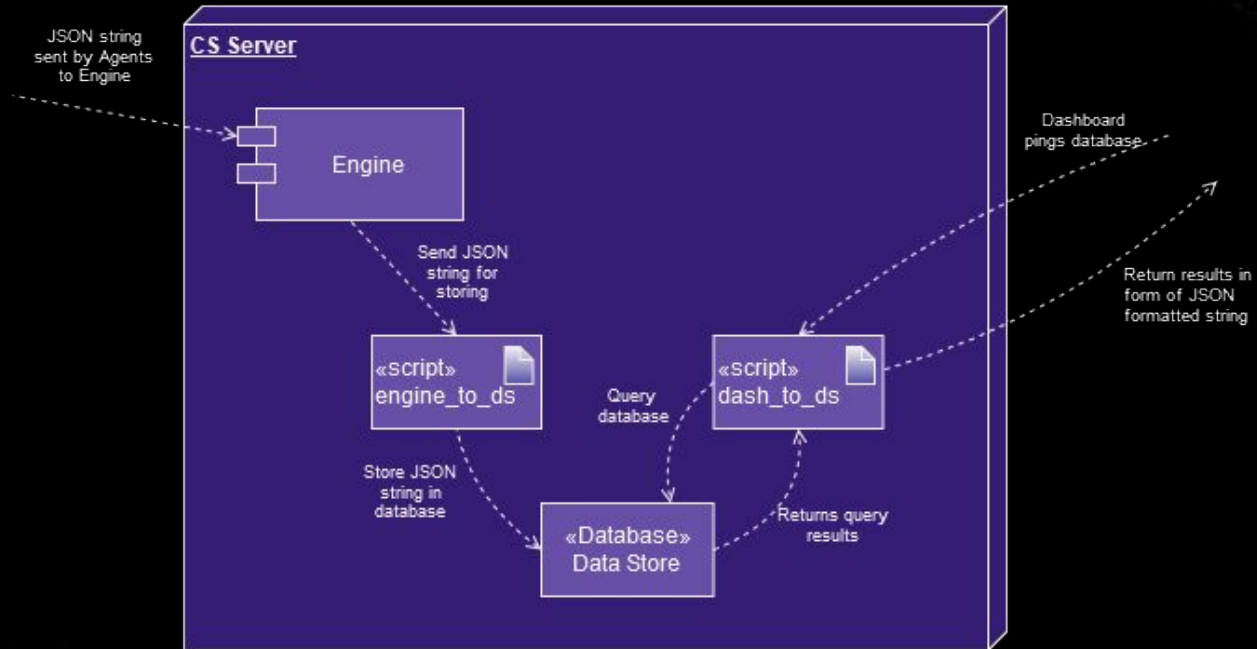
- SR26

## Aspect 5

Data Store retains data  
unless instructed

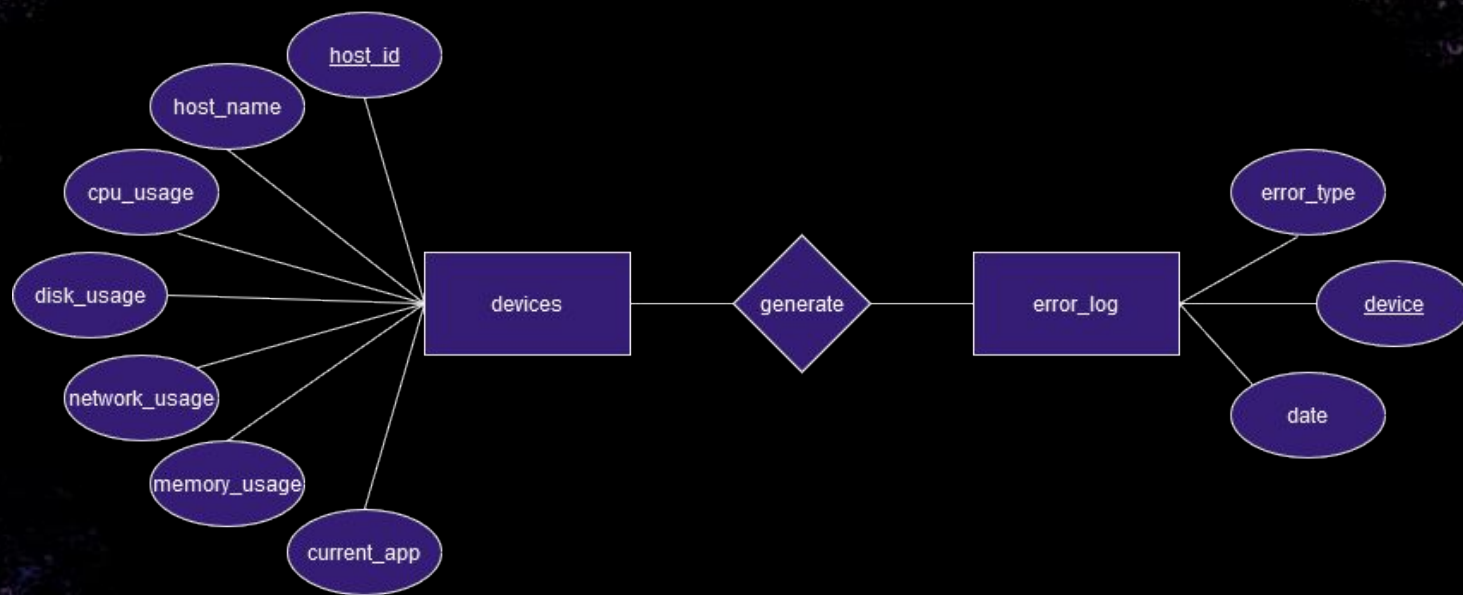
- SR27, SR28

# Software Design



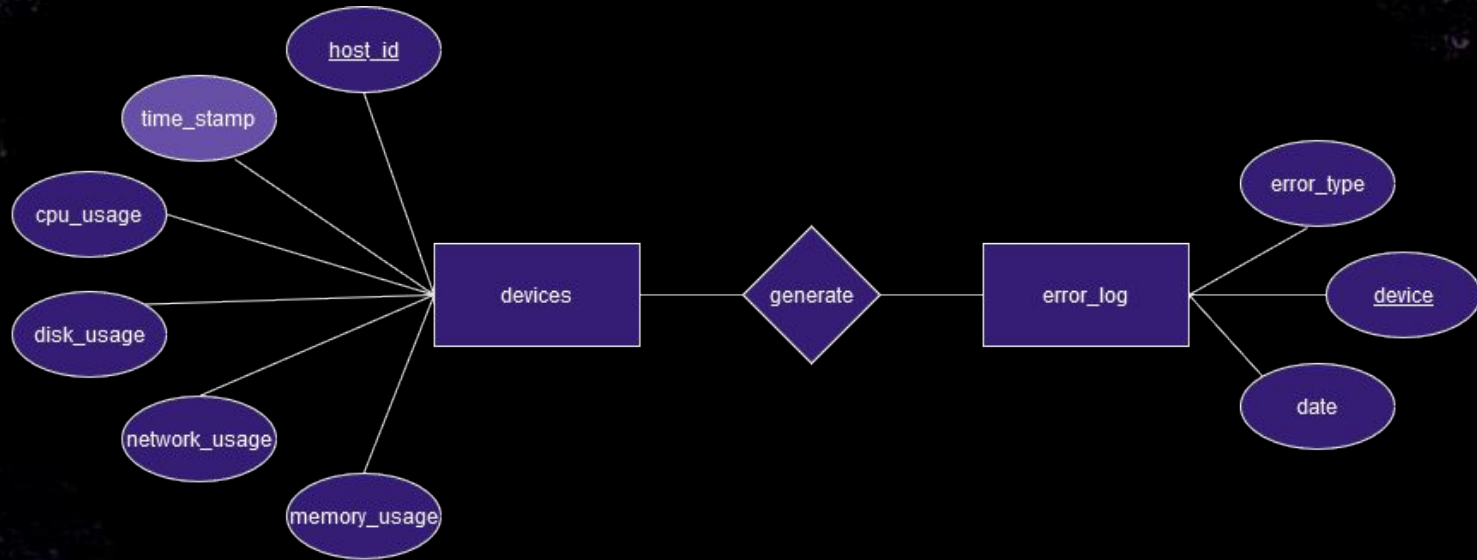


# Software Design





# Software Design



# Testing Schedule

Test Phase	Tasks	Beginning Date	Status
Beta	Get Database running in isolation	Mar 23	Completed
Unit	Get scripts connected to database	Apr 4	Completed
Integration	Connect to other components	Apr 23	Completed



# Traceability Matrix

ID	Requirement	Systems Component	Approach
SR01	Engine can create and send a network message to the Data Store	Database tables store received messages	Black Box
SR02	Data Store validates requests from Dashboard	Database table constraints	Analysis
SR06	Data Store sends data to the Dashboard	SQL Queries	Analysis
SR27	Data Store can hold data for at least a year	Analysis table; check table, optimize table, repair table, and get rows count queries	White Box
QR7	System can be ported to other devices	Configuration file	Analysis

Level 4 Matrix Table

# Traceability Matrix

ID	Requirement	Systems Component	Approach
SR13	Users can view CPU usage	'devices' table stores CPU usage	White Box
SR14	Users can view Memory usage	'devices' table stores Memory usage	White Box
SR15	Users can view Disk usage	'devices' table stores Disk usage	White Box
SR16	Users can view Network usage	'devices' table stores Network usage	White Box
SR17	Users can view monitored services	'devices' table stores monitored services	White Box
SR28	Data can be archived or removed by users	Archive database tables, insert and delete queries	White Box

Level 3 Matrix Table

# Traceability Matrix

ID	Requirement	Systems Component	Approach
SR11	Engine sends an error message to the Data Store when upon receiving invalid data	'error_log' table stores error messages	Black Box
SR26	Data Store is able to scale in size	Horizontal and vertical scaling	White Box

Level 2 Matrix Table

ID	Requirement	Systems Component	Approach
SR23	Data Store runs on Unix-like	CS server (cs.csis.work)	Item Inspection
QR5	Document and follow a coding style	SEI CERT	Item Inspection

Level 1 Matrix Table

# Security and Quality

- ❑ Ensuring security was not an issue
  - ❑ There were no security requirements
- ❑ To ensure the quality of the product:
  - ❑ All tests of software integrity level 1, level 2, level 3, and level 4 must be passed
- ❑ If a test is not passed:
  - ❑ A diagnostic message will be shown
  - ❑ The team will then have to review what is needed in order to pass the test
- ❑ If the Data Store runs successfully:
  - ❑ No diagnostic message will be shown
  - ❑ Nothing else will appear or be visible to end users



# Unit Test Results

Date	Time	Tester	Test Requirement ID	Test Result	Notes
4/4	12:00 PM	Jennifer	SR13	PASS	Successfully viewed CPU usage using SQL queries
4/4	12:00 PM	Jennifer	SR14	PASS	Successfully viewed memory usage using SQL queries
4/4	12:00 PM	Jennifer	SR15	PASS	Successfully viewed disk usage using SQL queries
4/4	12:00 PM	Jennifer	SR16	PASS	Successfully viewed network usage using SQL queries

# Unit Test Results

Date	Time	Tester	Test Requirement ID	Test Result	Notes
4/4	12:00 PM	Jennifer	SR17	PASS	Successfully viewed device IDs using SQL queries
4/13	12:30 PM	Claire	SR28	PASS	Successfully archived data and removed data from the database
4/13	12:30 PM	Claire	SR23	PASS	Successfully ran on CS server
4/30	7:30 PM	Claire	SR11	PASS	Successfully received error message and inserted it into the database

# Integration Test Results

Date	Time	Tester	Test Requirement ID	Test Result	Notes
4/23	6:45 PM	Jennifer	SR02	PASS	Successfully able to receive and verify query from Dash
4/23	7:00 PM	Jennifer	SR05	FAIL	Encryption issue, Dash unable to read file
4/25	7:30 PM	Claire	SR01	FAIL	Socket errors
4/28	6:30 PM	Claire	SR01	PASS	Successful connection with Engine, successfully stored messages received
4/28	6:30 PM	Claire	SR28	PASS	Successfully archived data and removed data from the database

# Integration Test Results

Date	Time	Tester	Test Requirement ID	Test Result	Notes
4/28	6:30 PM	Claire	SR11	FAIL	No error log received, received bad values instead
4/28	6:30 PM	Claire	SR23	PASS	Successfully ran on CS server
4/29	10:30 PM	Jennifer	SR05	PASS	Successfully received and sent message to Dash
5/1	3:30 PM	Jennifer, Claire		PASS	Successfully ran entire system
5/1	3:30 PM	Claire	SR11	PASS	Successfully received error message and inserted it into the database

# Overall Project

- ❑ Teamwork
- ❑ Adapting to problems
- ❑ Specifications of phases within software lifecycle - implementation and design
- ❑ Verifications and Validations
- ❑ Requirements
- ❑ Version Control