IOWA STATE UNIVERSITY Center for Cybersecurity Innovation & Outreach

CySim

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CySim Breakdown

What is CySim?



• CySim is a currently in progress cyber sports complex that can be used to host cyber security scrimmages or skill-development events

What is the goal of CySim?

- The goal of CySim is to help students improve their cybersecurity skills and readiness
- Help employers find the best candidate for the job by giving them a safe place to test their skills

Implementation Architecture

Below is our Gantt Chart of CySim for how we planned to tackle the implementation of the web application.



Implementation Architecture

Below is a video displaying the current state of the CySim Web Application, showing its features.

CySim Progress

Tasks Completed:

- Creation of the CySim Web Application
- Logging in as Admin, Red member, and Blue member
 - Loading different views based on the user's role
- Scenario Page
 - Add a new Scenario
 - Upload documents
- Scoreboard Page
- Tutorials page
 - Add a new Tutorial
 - Upload Documents
- Team Registration
 - Add/Edit Teams
 - Delete Team
 - Join Team
- Docker Implementation
 - Integration Tests Backend

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CySim ScoreBoard Tutorial Scenario	Hello Admin@gmail.com/ Logout		
Access the tutorials here	International		
Getting Started			
FileName	Description		
Game Type			
FileName	Description		
Upload one or more files using this form:			
Choose Files No file chosen			
Upload			

CySim Progress Continued

Tasks to be completed:

- Finish creating and implementing the machine communication between VMWare and CySim
- Clean documentation of the Web Application
- Update Nuget Packages in CySim
- Implement various design features to make the web app more user friendly
- Fix bugs in Team Registration backend
- Fix Microsoft Identity bug where email is showing instead of username
- Implement serilog logger to print log info to a file
- Implement various design features to make the web app more user friendly
- Full troubleshooting of the tutorials to make sure it loads for every kind of user and what they would need access to

Bailey's Work

- Creation of the CySim web application through .NET Core 3.1
- Creation of database to talk with web application and established the best way to query database
- Upgraded CySim to use .NET Core 6
- Successfully implemented Microsoft Identity to work with CySim
- Made CySim load different views based off the users role admin, red, and blue
- Full creation of the home page
- Started frontend development on Scenarios, Team Registration, Tutorials, and Scoreboard
- All of backend work in Scenarios, Team Registration, Tutorials, and Scoreboard
- Implement a document upload service for tutorials and scenarios
- Guided team to get the project running on their local machines
- Beginning implementation of machines that will talk to CySim

Brady's Work

- Helped establish and layout some of the original plans and design features of the Web Application.
- Worked on the creation and implementation of the tutorial pages within the Web Application.
- Doing in depth research on .net in order to accurately work through the CySim website.
- Designing and developing different display items for CySim to make it appeal more to the user and make it easy to use and operate.
- Documentation for the Web Application and how it relates to the future of CySim.
- Currently beginning work on the Machines for the Scenario implementation and development.

Current Tutorials

Red Users

When creating an account you will need to follow the guide below:

CySim Home Privacy	Register	Login
Register Create a new account.		
User Name		
Emai		
Password		
Confirm password		
Roff Scherzt Nole A - Roff Team Blue Team		

- You will supply a username of your liking, we recommend having some sort of combination with "red" so that it's easy to remember and follow.
- You will need to provide an accurate email address for the account as well as a password.
- Last thing you need to do is select a role, since this is for red users you would select "Red Team".

The following is of access to Red Users once they are signed in to CySim:

CySim Home Team Register ScoreBoard Tutorial Privacy

Hello Rickybobby@gmail.com! Logout

Leaderboard

Rank	Name	Score
1	Cyclones	77

We have built in tutorials for the following:

- Admin Accounts
- Blue Team Accounts
- Red Team Accounts

Matthew's Work

- Administrative work such as meeting setup and client communication.
- Worked on setting up team members who use Windows with the local SQL server needed to run the web application locally for development.
- Cleaned up the scoreboard page placeholders in preparation for dynamic table size based off number of teams.
- Implemented a primitive dynamic table size in preparation for the data to become available to pull for the scoreboard from the SQL server.
- Implemented multiple CSS and other styles for use with the scoreboard.
- Updated necessary database migrations with flags and usability scores for future population

Current Scoreboard Design:

CySim ScoreBoard Tutorial Scenario

Hello test1@test.com! Logout

Scoreboard

Placement		Score	Flags	Usability	
1		Team 1: Foxes	797	797	0
2	2	Team 2: Foxes	797	797	0
3	2	Team 3: Foxes	797	797	0
4	2	Team 4: Foxes	797	797	0
5		Team 5: Foxes	797	797	0

Ethan's Work

- Designed some higher level systems including rough network architecture
- Collaborated with client to help define the scope of this year's progress amid this multi-year project
- Working towards modular interface designs in scoreboard and team pages to support future versatility
- Working on enhancing user interface through C#HTML
- Researching .NET and C#HTML to support further feature development

Jacob's Work

- Set up deployment with Docker to be used on Linux Systems
- Creation of docker integration tests and healthchecks to ensure docker's network environment is functional
- Researched .NET, C#, C#html, and MVC architecture
- Worked on design of the scenarios for easy of use for admins to upload files and for players to view scenario files
- Set up unit and integration tests in .NET core 6.0 using Xunit
- Creation of GitHub pipeline to check for Xunit test failure when code is updated
- Automated updates of dependencies with dependabot

Key Challenges/Solutions

- We had issues getting everyone full access to the Web App and git repo due to various OS issues
 - This was solved through trial and error in team meetings
- Load different views based off of the users roles
 - Microsoft Identity was able to help us with this
- Working on an efficient way to implement the Tutorials/Scenarios without having to add a bunch of new pages
 - Using Baileys document upload service that will allow you to upload documents to the app and working to get it so the user can click a direct link to the tutorials we developed.
- We had trouble between Frontend and Backend on deciding whether to use .net 7 or .net 6.
 - This was due to Jacob's testing fork needing .net 7 to resolve packet compatibility.
 - We decided to use .net 6 and have Jacob implement a work around, if this doesn't work we would have to move everything to .net 7.

Conclusion

What have we learned so far?

- How to use .NET Core framework and how it works on various platforms.
- Designing a web application in a team setting.
- How to manage working different pieces of the project and combining them together.
- What we need to do in order to get CySim to where we need it to be.

Next Steps for CySim?

- Full Database implementation for the Scoreboard.
- Creating of mock machines as well as Scenarios for the game to be played.
- In depth documentation on what has been done on the Web Application.
- Updated designs and displays for the Web Application that will be implemented.
- More Backend to Frontend connection.
- Fix microsoft identity so that username is displayed when logged in and not the email address.

Team Registration - Cyslen X +					
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CySim Team Regi	ster ScoreBoard Tutorial Machine *	Scenario		Hello Blue@gmail.com/ Logout	
	Weld	come to Team Re	egistration		
Some thing • If you do not see • The creator • If you see a team • Each team has the	Is to know before you a team that you wish to join then you will be a team is able to edit and delete thi that you wish to join then you will be able e ability to have up to 6 players so choose	register for a team be able to create your own the beam that they create to click join on that team e wisely.			
Register Fo	r a Team here			Register or Add a Team	
	AvailableSpots	SpotsTaken	Join Team	Edit/Delete	