RFID AREA INFORMATION NETWORK (RAIN)

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EXECUTIVE SUMMARY

- RFID Area Information Network (RAIN) is a RFID scanner, RFID processor, webserver and database, website and application.
- The desired objectives for RAIN are as follows:
  - Provide a scannable area of two meters or greater, this is to provide safety for the transportation personnel and the system.
  - Display the car IDs on a user- friendly interface
  - Store the data for undetermined amount of time

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PROBLEM STATEMENT

- Insufficient tracking of rail cars on a large industrial campus can lead to rail cars being held for periods past their rental agreements, resulting in fees which grow exponentially, quickly. Without a tracking system in place, companies such as Steel Dynamics, Inc. pay $1,500 each month in demurrage, or late fees.

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SOLUTION STATEMENT

- This project consists of five subsystems working together—an RFID scanner, antenna and reader all-in-one unit, RFID processor, an application, a webserver and database, and a website.
- A scanner will retrieve the railcar serial number, and pass the information to a RFID processor, which transmits it to a database. A website queries the database to retrieve the data and the time and location a car was scanned.

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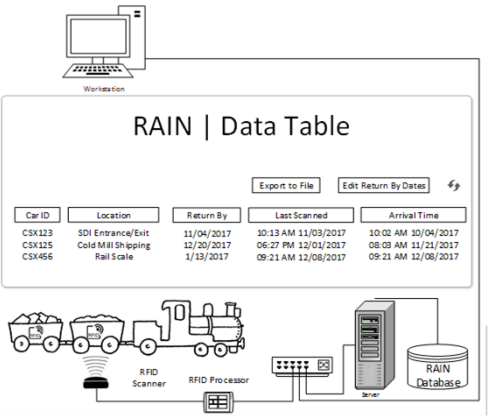
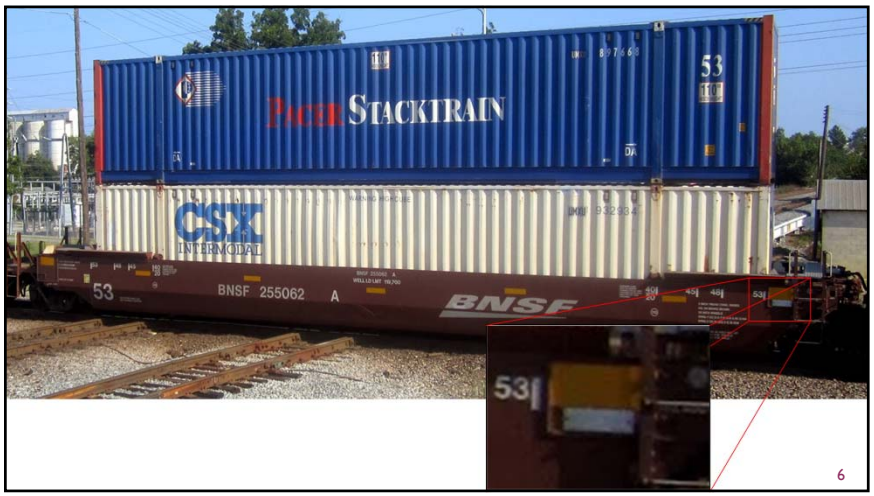
RAIN – SYSTEM OVERVIEW





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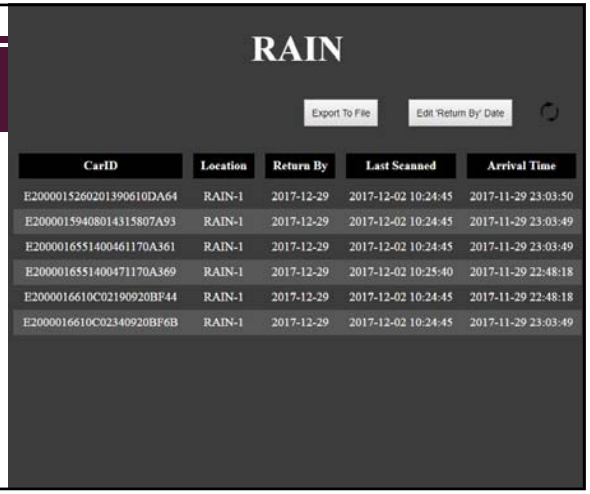
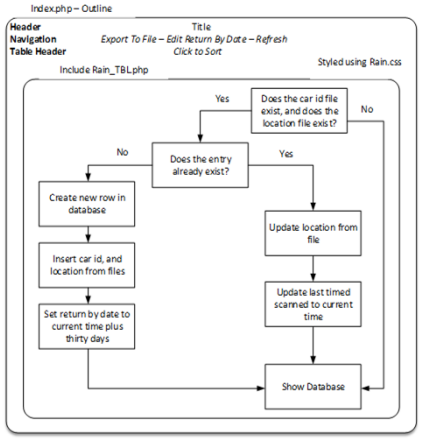
RAIN - SUBSYSTEM

- RAIN Website
- Designed using HTML5, CSS, JavaScript, PHP, and SQL

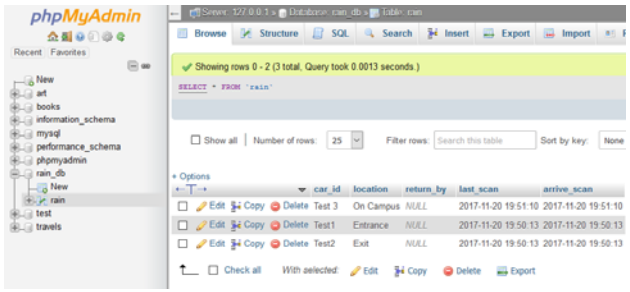


RAIN WEBSITE OVERVIEW



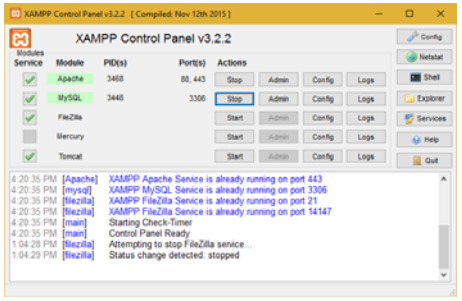
RAIN - SUBSYSTEM

- phpMyAdmin installed with MySQL
- Manages MySQL Database



RAIN - SUBSYSTEM

- XAMPP Control Panel
- Installs Apache Webserver and MySQL Database



RAIN – SUBSYSTEMS

- ChaFon Antenna and RFID reader
  - ISO 18000-6C Compliant
  - Effect distance up to 8 meters
- GearMo USB to Serial Adapter

RAIN - SUBSYSTEM

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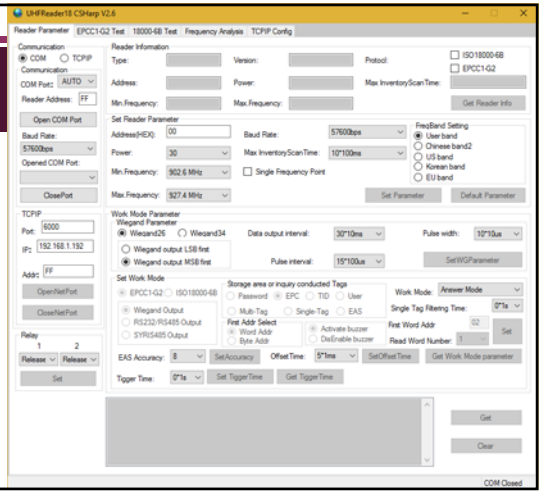
RAIN - SUBSYSTEM

- ChaFon Demonstration Application
- Able to adjust multiple setting on the antenna and reader



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MATERIAL COST

Item	Cost Each	Qty	Total Cost
NexBox Mini PC	$ 159.99	1	$ 159.99
RFID Antenna and Reader	$ 209.90	1	$ 209.90
USB to RS232	$ 15.88	1	$ 15.88
Material Total			$ 385.77

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CONCLUSION

- The use of this cost-effective system will help create additional efficiency within the SDI Butler campus, by better tracking scrap shipments through strategic scan points on the campus, and ensuring timely return of railcars to avoid unnecessary costs.
- Along with this project, the SDI Butler campus is looking at this project for employee entrance security.

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Demonstration

Rainweb.zapto.org

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Thank you

Questions?