

Multi-User Computer Controlled Railroad

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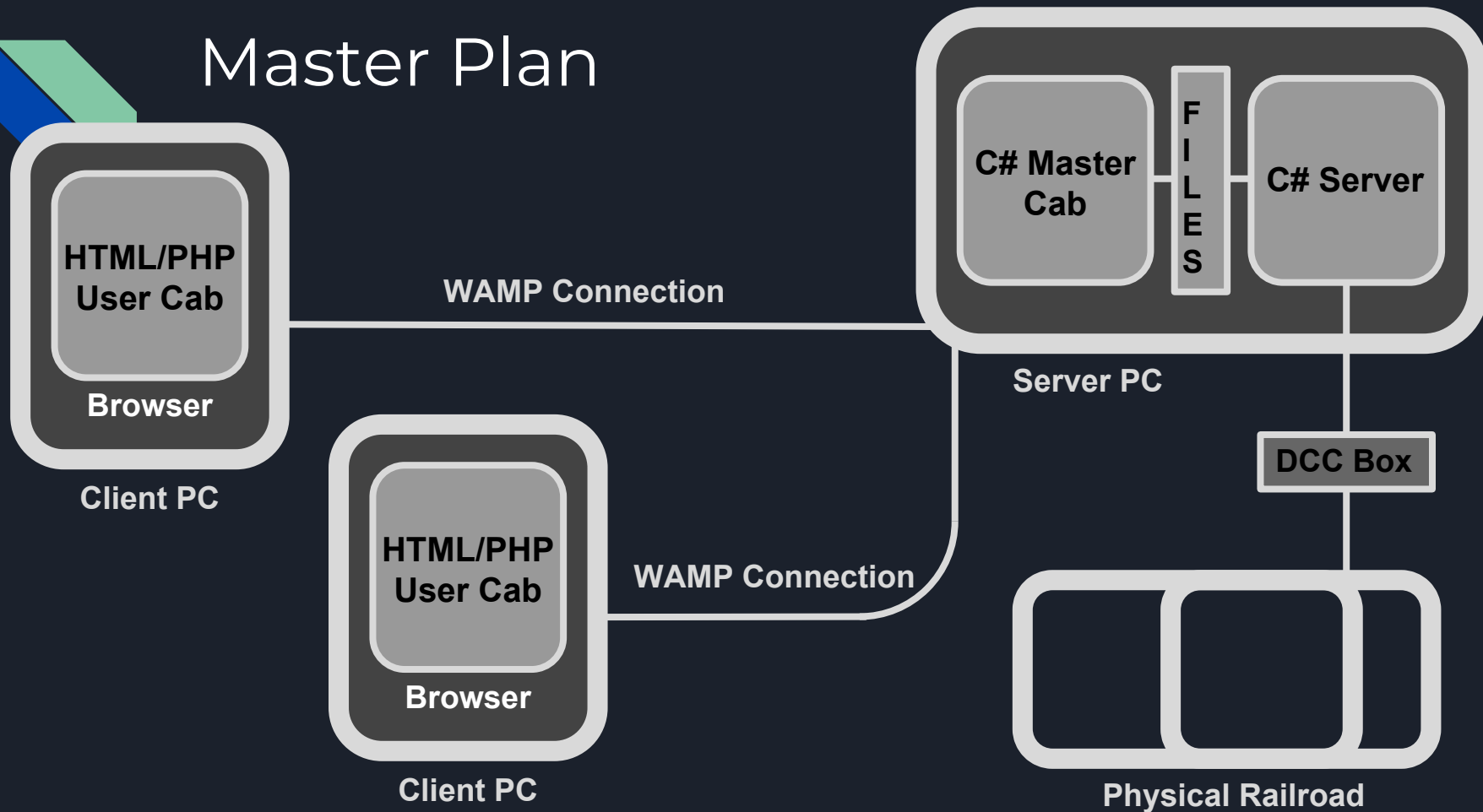
Project Definition

Develop a system that:

- Uses operating system concepts to handle resource ownership for tracks, trains, & other resources.
- Uses an API to communicate with the railroad.
- Contains a user interface to allow a people to control a train on the track.
- Allows for multiple users to interact with the track resources without collisions.



Master Plan





Successful Solutions

Server

- Data structures
- Resource granting
- Displays
- File reading/writing

Master Cab

- Train requests
- Turnout requests
- Display updating via file read

User Cab

- WAMP server
- HTML design
- Initial display reads





Unsolved Solutions

Server

- Exception handling during disconnect

Master Cab

- Aesthetics

User Cab

- Control requests writing to files
- Refreshing display from files
- Turnout controls





Methods

Early methods:

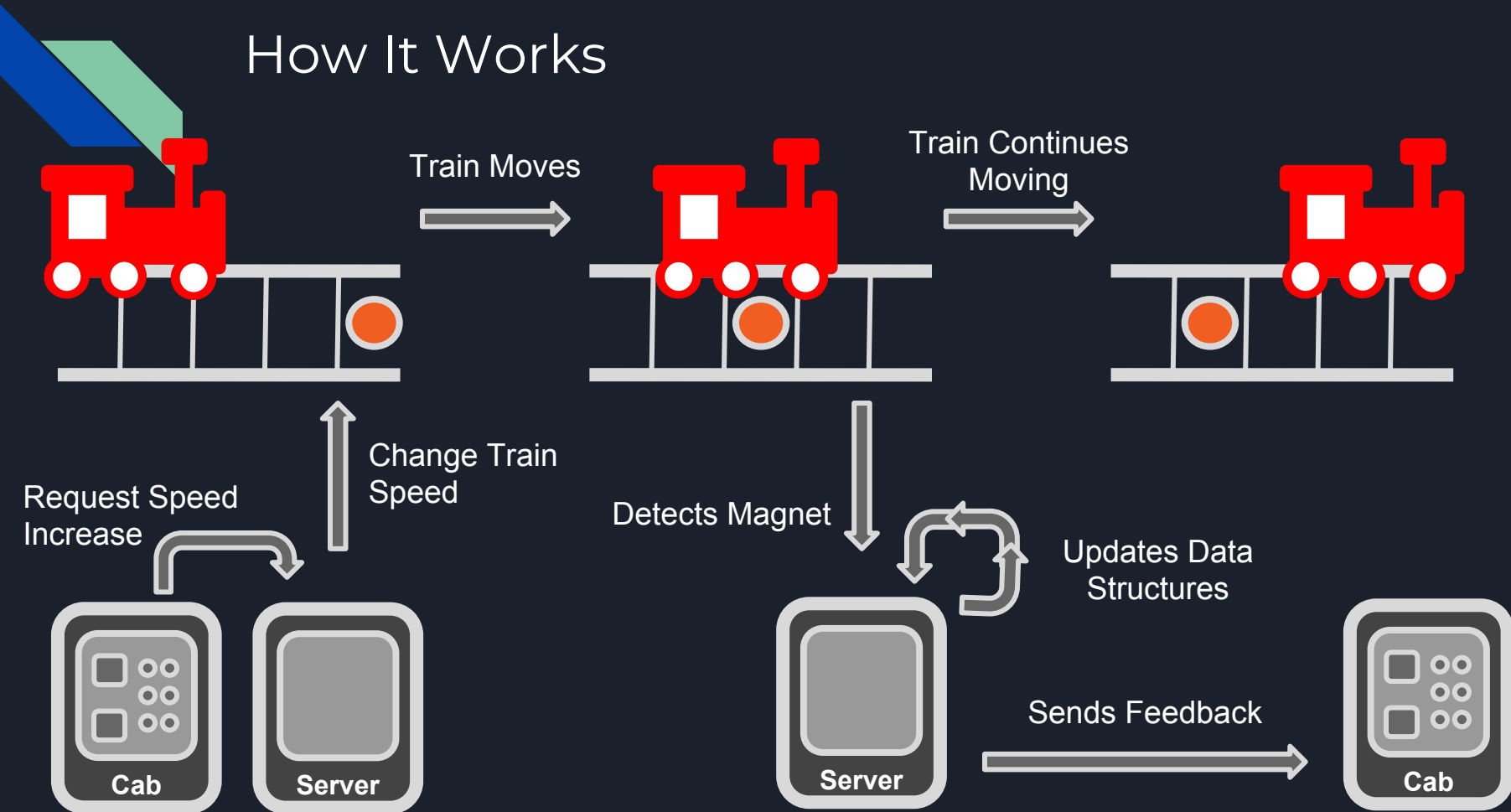
- Paper/pencil experiments
- Simple, compact structures

Final methods:

- Object-Oriented - Meaningful data and methods
- Event driven - Users & DCC trigger events



How It Works





Demonstration

- Adding trains
- Using CAB to occupy train
- Moving trains:
 - Track requesting
 - Dead-ends
 - Turnouts
 - Competing resources

Known issues:

- Derailments
- Sensor misses
- Port exceptions on disconnect





Strategies & Knowledge

Strategies:

- Attention to detail
- Focus on whole parts
- Rigorous testing

Knowledge:

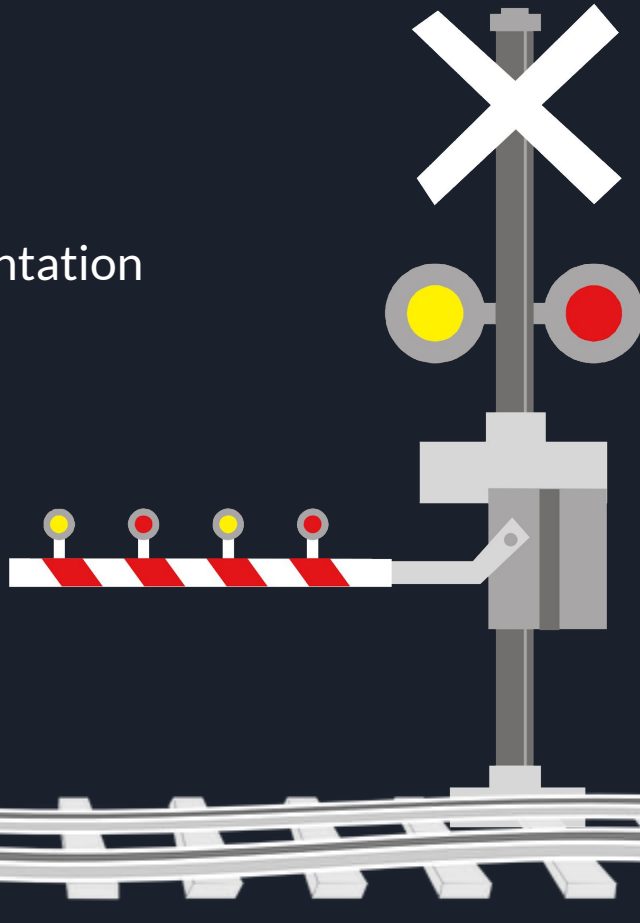
- CSCI-220 — Advanced Data & File Structures
- CSCI-322 — Programming Languages
- CSCI-350 — Event Programming
- CSCI-370 — Operating Systems





Roadblocks

- Plan to throw one away
- Understanding old documentation
- Design for User Cabs
 - Sockets
 - compsci02
 - WAMP
- Physical railroad testing





Extensions

- New graphical design for server displays.
- Different methods of implementing User Cabs.
- Modify resources to allow for trains to haul cars.
 - Add speed change latency based on “weight” of train/cars.
- Add opcodes for toggling horns/whistles as well as lights.





Open for Questions

