

MICHIGAN STATE

UNIVERSITY

Alpha Presentation

3D Model for Factory Digital Twin

The Capstone Experience

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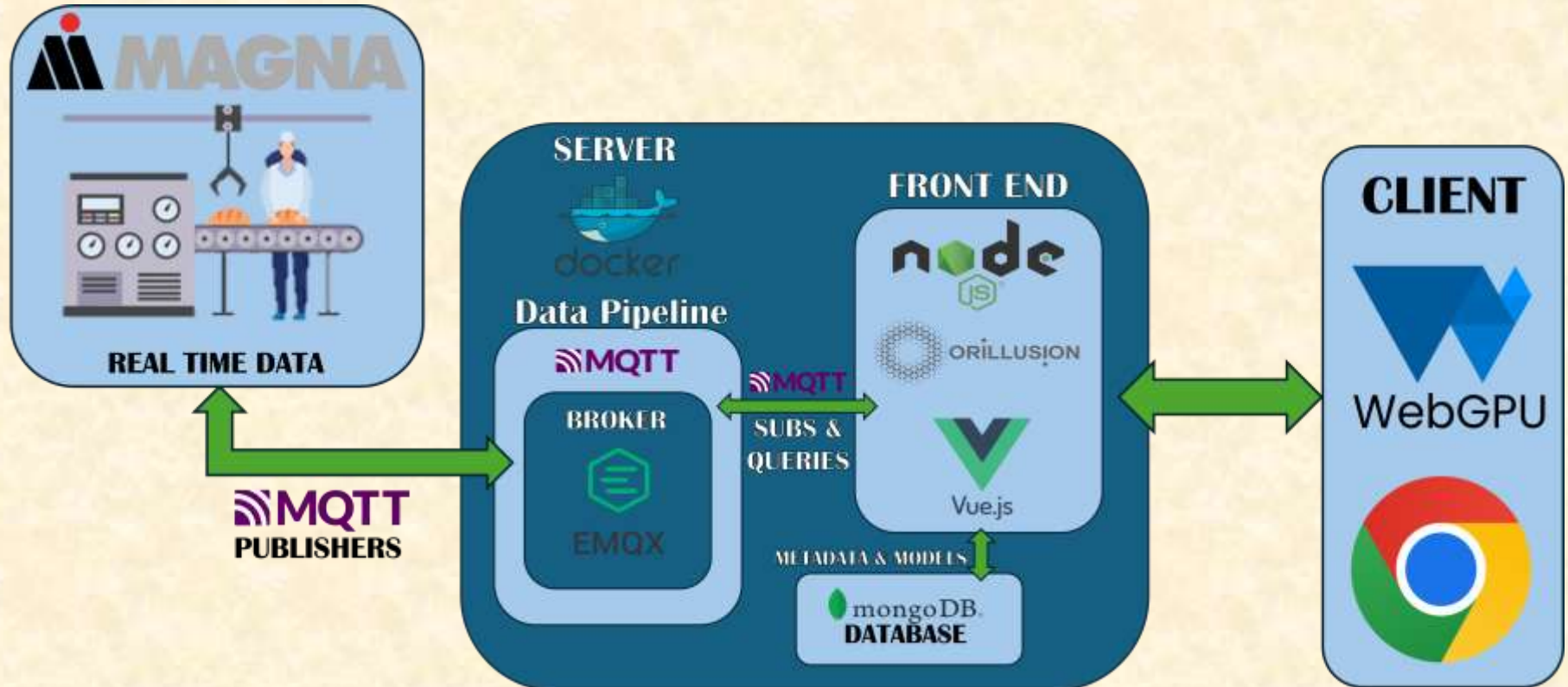
*From Students...
...to Professionals*

Project Overview

- Visual model of factory
- Display real-time updates of sensors
- Quickly view factory and find issues effectively with visual changes
- Create generalized solution to allow for expansion/scaling



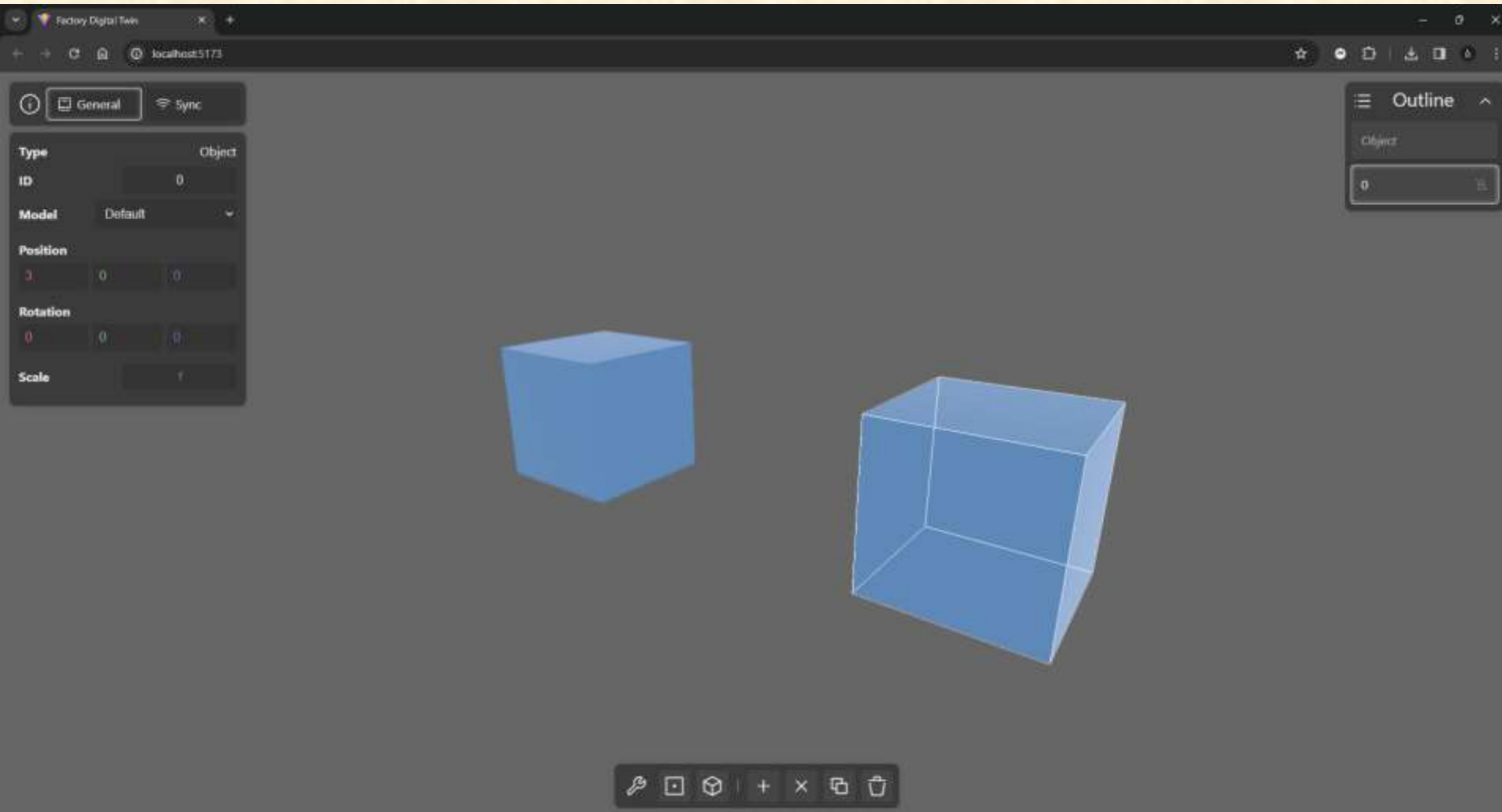
System Architecture



Example Factory Floor Loaded



Object Highlighting & Info



MQTT Manual Tool to Simulate Data

Asset ID	X Position	Y Position	Z Position	Temperature
0	0	0	0	25.0
1	0	0	0	25.0
2	0	2	0	25.0

Live Data & Alerting

The screenshot displays a web application interface for a digital twin. On the left, a control panel includes a 'General' tab and a 'Sync' button. Below this, there are settings for 'ID' (Optional), 'Data type' (Single value), and 'Default value' (0). A slider control is visible with 'Min' set to 0 and 'Max' set to 100. In the center, a dark alert dialog box is shown with the text: 'Alert', 'Issue Detected at the following:', 'Temperature exceeded maximum threshold.', and an 'Ok' button. On the right, a browser's developer console is open, showing a list of 14 issues. The first issue is a 'Unchecked runtime.lastError: The message port closed before a response was received.' Other issues include 'Scripts have loaded', 'Calling [RenderPassEncoder "undefined renderPassDescriptor" ?preTextureClear].Draw with an index count of 8 is unusual.', and '1 is NOT a valid object'.



What's left to do?

- UI Values Change with Live Updates
- Serialization / Saving & Loading
- Concurrency & Asset Loading
- A lot of Quality Assurance Testing



Questions?

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