Weekly Progress Report

Project Name: AWS PROJECT
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1. Executive Summary
This week focused on breadboard prototyping, validating circuit connections, and writing low-level C/C++ firmware. Significant progress was made by simultaneously validating hardware, refining the schematic/PCB design, and creating modular algorithms. The Gateway board design has been optimized, and the groundwork for high-level server communication is complete.

2. Key Accomplishments

- **Hardware Validation:** Successfully tested all individual subsections of the Gateway board on a breadboard to verify functionality.
- **Firmware Development:** Developed modular C++ classes for sensor testing and communication protocols. This structure ensures easy code modification and seamless interfacing with higher-level protocols (e.g., HTTP, MQTT).
- **Design Refinement:** Updated the general schematic by removing redundant connections found during testing.
- **PCB Optimization:** Redesigned the PCB layout based on the refined schematic, successfully reducing the overall board footprint.

3. Challenges & Technical Constraints

- **UART Resource Conflict:** The ESP32 utilizes a single extra UART port for both the GSM and LoRa modules. This requires the modules to operate mutually exclusively (when one is on, the other must be off).
- **GSM Timing Logic:** The GSM module requires a specific toggle sequence and has a long setup time, making the shared-UART configuration difficult to manage. This has been identified as a software timing issue and will be resolved through code refinement.

4. Plan for the Upcoming Week

- **Power Board Integration:** Shift focus to testing and validating the Power Board circuits.
- **Full Prototype Assembly:** Move from breadboard subsections to creating a comprehensive prototype using a perforated board to validate the system as a whole.