Fire! Fire!

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Materials

- BeagleBone Black with Debian
- LCD Display
- Altera Cyclone II FPGA
- GPIO Expander
- OURLiNK USB Wi-Fi Adapter
- Nichrome Wire
- Voltage Divider
  - 640Ω Thermistor / 100Ω Resister
- Node.js Server
- Power Supply

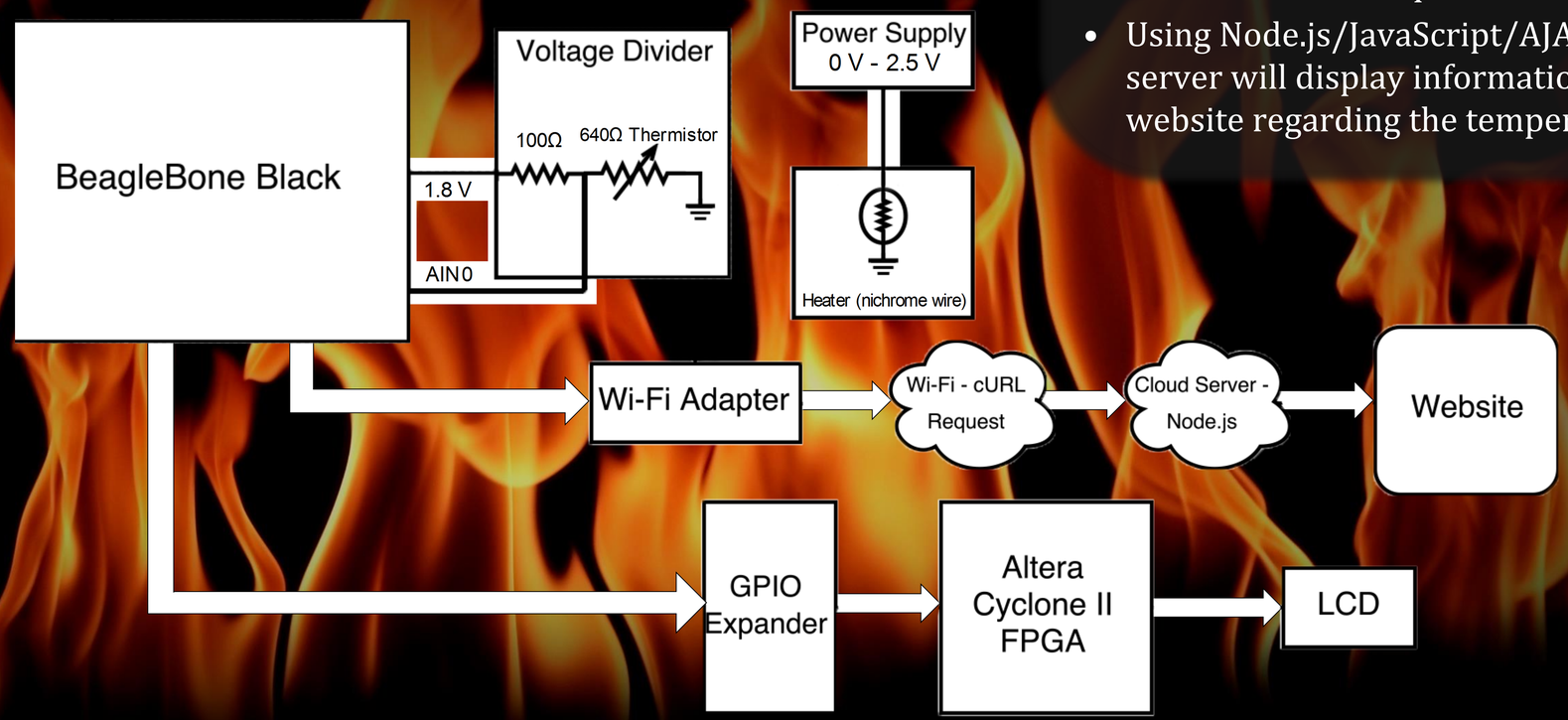
Real World Applications

- Hardware temperature control
- Climate control systems
  - Greenhouses
  - Residential homes
- Monitor temperature levels in senior homes
- Regulate heat in commercial food warmers

A Heat-Based Warning System

Fire! Fire! uses a circuit that detects heat and calculates the temperature. It displays heat levels from “Normal” to “Fire! Fire!” and temperature on an LCD and relays this information to a website, updated in real-time. As the temperature increases to dangerous levels, it notifies the user when a fire occurs.

Block Diagram



Design

- The power supply will control voltage applied to the nichrome wire
- The thermistor's resistance will be altered based on the heat from the nichrome wire
- Analog voltage is received by the BeagleBone Black - the temperature is calculated from this voltage
- The BeagleBone will send this data through the Wi-Fi adapter to a node.js server via cURL request
- Using Node.js/JavaScript/AJAX, the cloud server will display information on the website regarding the temperature level