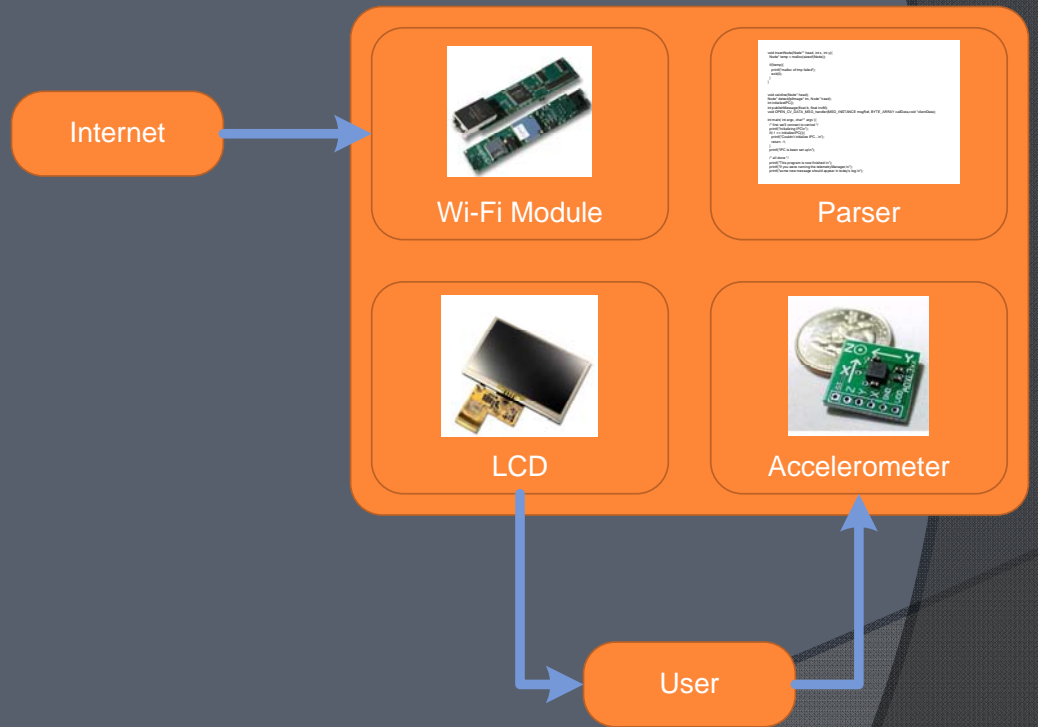Kenneth Chan
Andrew Lai
Jon Li
Jesse Mwaura

System Architecture

netwifimicroSD
verdex XM4-bt
consoleLCD-vx
Samsung 4.3" LCD

Triple Axis Accelerometer Breakout
LIS3LV02DQ

Internet → Wi-Fi Module

Parser

LCD

Accelerometer

User

Test Cases

- ◎ Boot Time
  - Device must initialize correctly and in a timely manner
  - Fault-free

- ◎ Hard Shutdown
  - Device must not corrupt saved files or settings in the event of hard shutdown
  - Failure-injected

- ◎ Wireless Bandwidth/Latency
  - Internet connectivity measured in unit of signal strength, bandwidth and latency
  - Fault-free

- ◎ Displaying text
  - Device must be able to display text to convey information
  - Fault-free

- ◎ Retrieve RSS feed
  - Device must be able to retrieve an xml file to parse
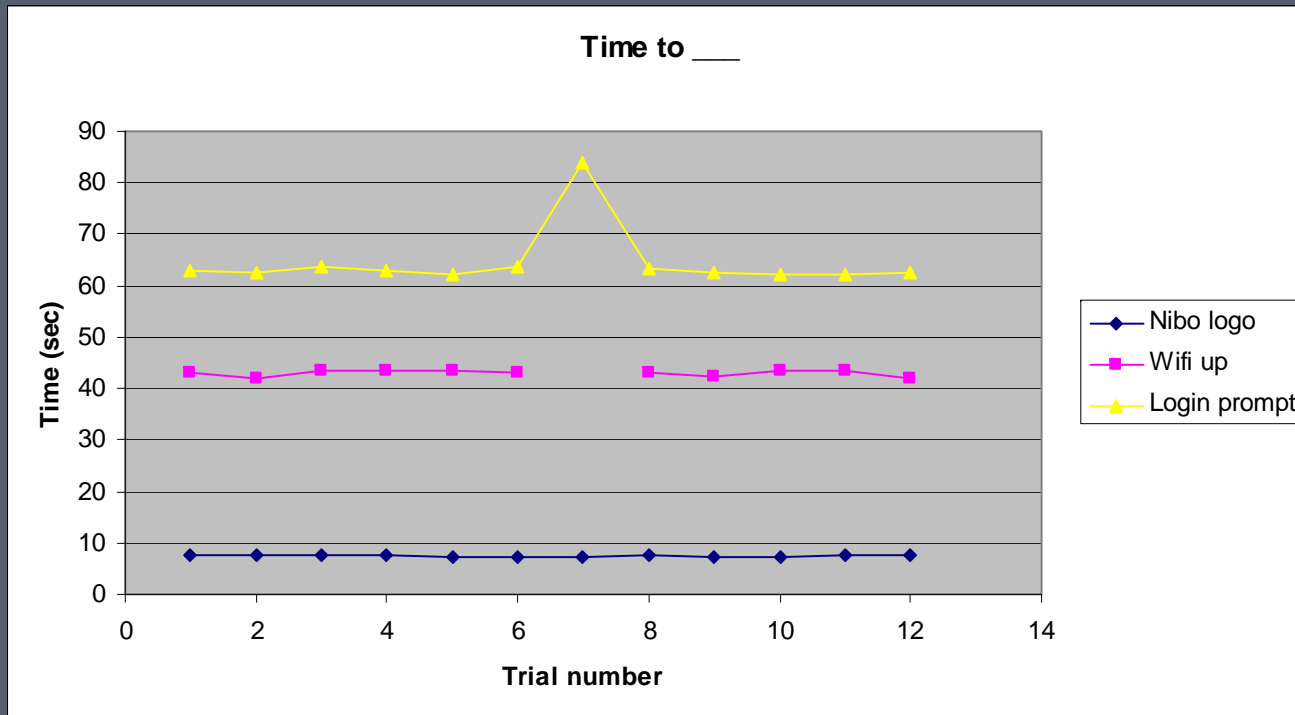 - Fault-free

Test Cases (Continued)

- **Soft Shutdown**
  - Device must shutdown gracefully and store all settings
  - Fault-free

- **Display Graphics**
  - GUI is more user friendly
  - Fault-free

- **Parse RSS feed**
  - Device must be able to parse xml file to display pertinent information
  - Fault-free

- **Interface with accelerometer w/ gumstix**
  - Device must be able to read accelerometer information to switch feeds
  - Fault-free

- **Interpreting Accelerometer data**
  - Need accelerometer data to switch between feeds.
  - Fault-free

- **Loss of Network Connection**
  - Device must be able to re-establish network connection if it is lost
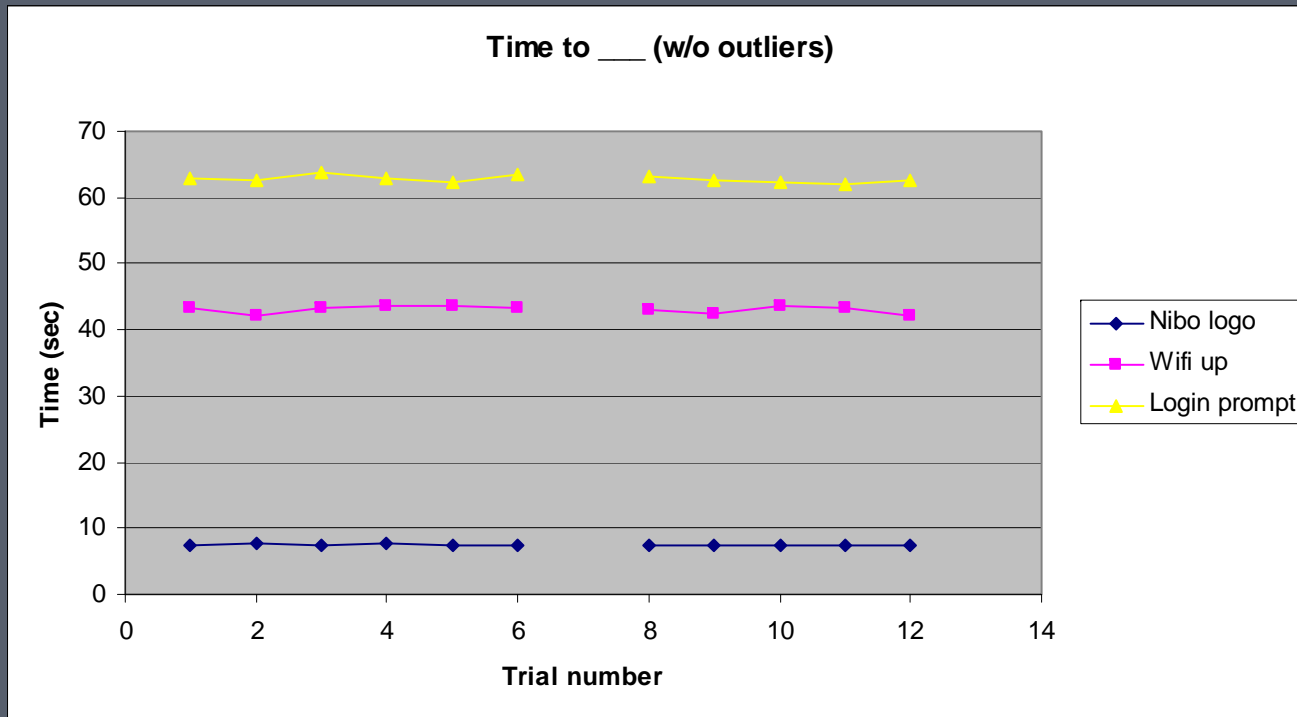 - Failure-injected

Metrics

- Time required to:
  - Boot up
  - Shutdown
  - (Re)acquire network connection
  - Retrieve and parse RSS file
- Latency on response to user input
- Sensitivity of accelerometer
- Freshness/staleness of feeds

Initial Results

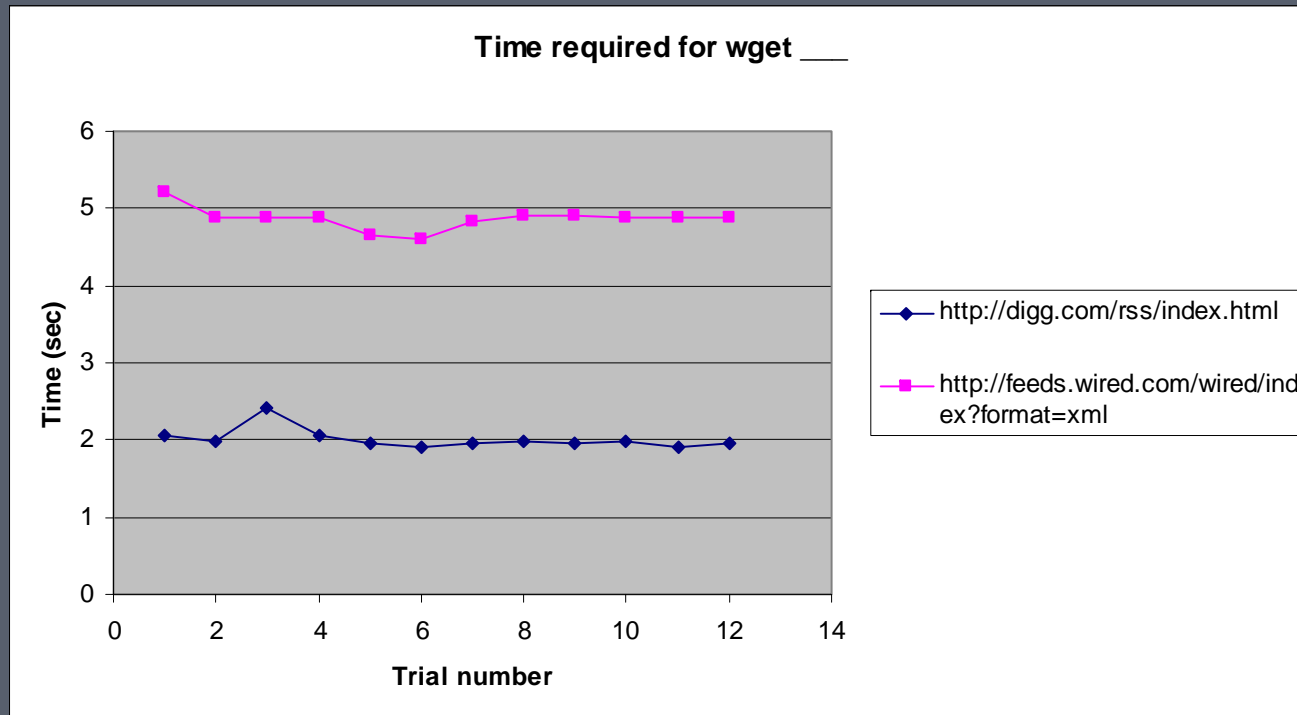- 12 trials
- Time to ___ (Mean, SD)
  - Nibo logo - (7.5, 0.12792043)
  - Wifi up - (43.01818182, 0.568890467)
  - Login prompt - (64.55, 6.115628266)

- Trial number 7 is an outlier
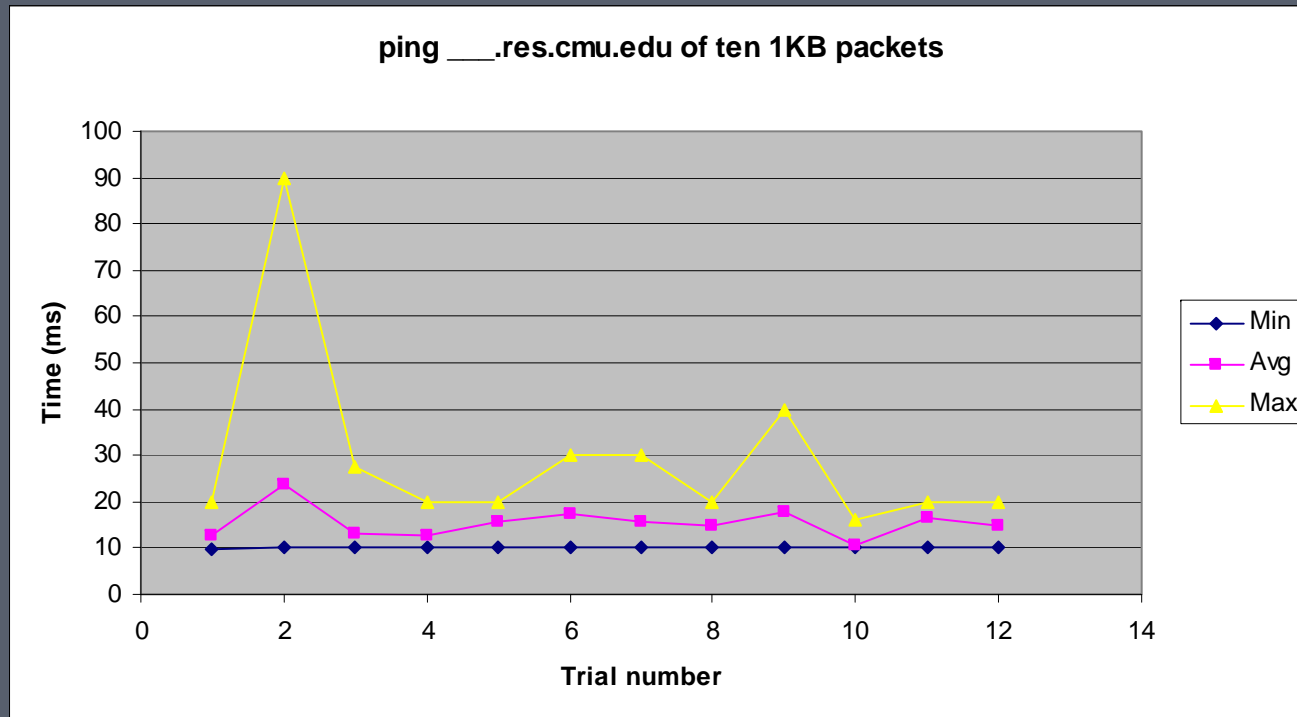- During trial 7, the device was not able to acquire a network connection

Initial Results

Time to ___ (w/o outliers)

- Nibo logo
- Wifi up
- Login prompt

(y-axis: Time (sec), x-axis: Trial number)

- ⦿ 11 trials kept
- ⦿ No 3SD outliers
- ⦿ Time to ___ (Mean, SD)
  - • Nibo logo - (7.509090909, 0.13003496)
  - • Wifi up - (43.01818182, 0.568890467)
  - • Login prompt - (62.79090909, 0.54305533)

Initial Results

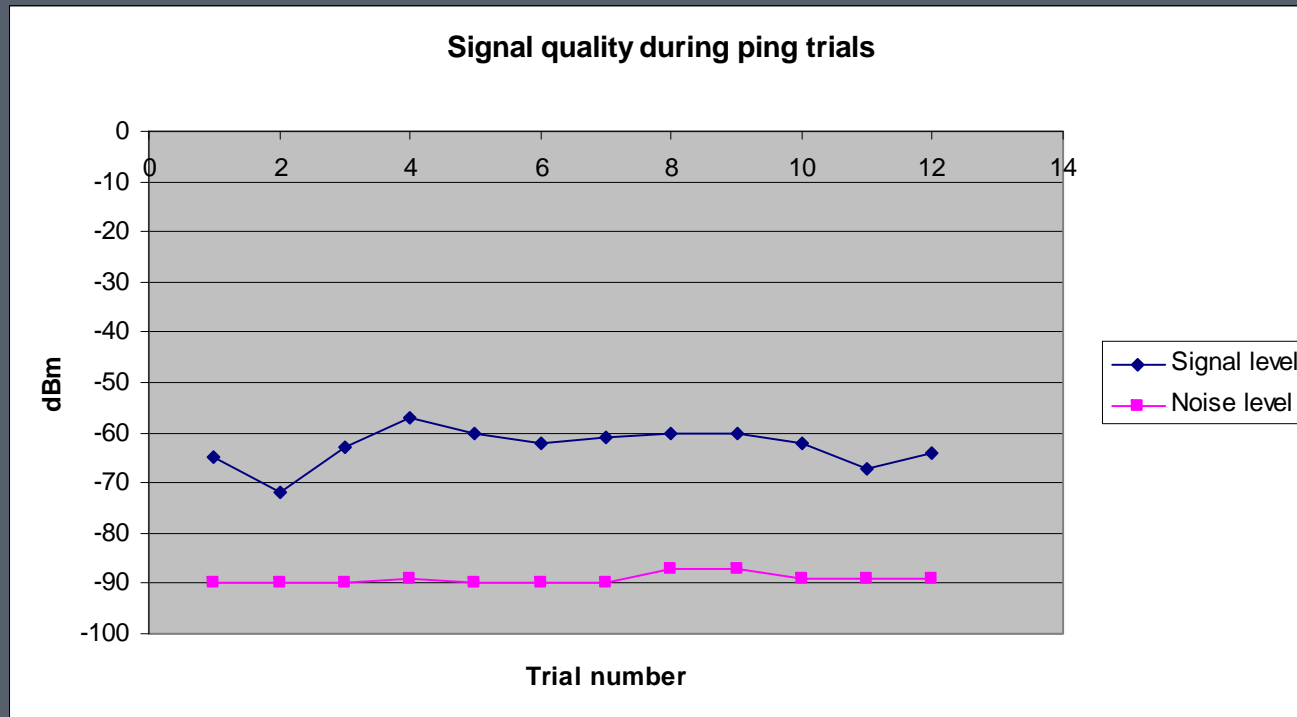**Time required for wget ___**

- 12 trials
- No 3SD outliers
- Time required to wget ___ (Mean, SD)
  - digg - (2.010833333, 0.13694447)
  - wired - (4.865, 0.153593324)

Initial Results

ping ___.res.cmu.edu of ten 1KB packets

- ⊙ 12 trials
- ⊙ No 3SD outliers
- ⊙ ping ___.res.cmu.edu (Mean, SD)
  - • Min - (10.00833333, 0.079296146)
  - • Avg - (15.45, 3.337255269)
  - • Max - (29.45833333, 20.19394411)

Initial Results

Signal quality during ping trials

- 12 trials
- No 3SD outliers
- Signal quality (Mean, SD)
  - Signal - (-62.75, 3.934116512)
  - Noise - (-89.16666667, 1.114640858)

Initial Results

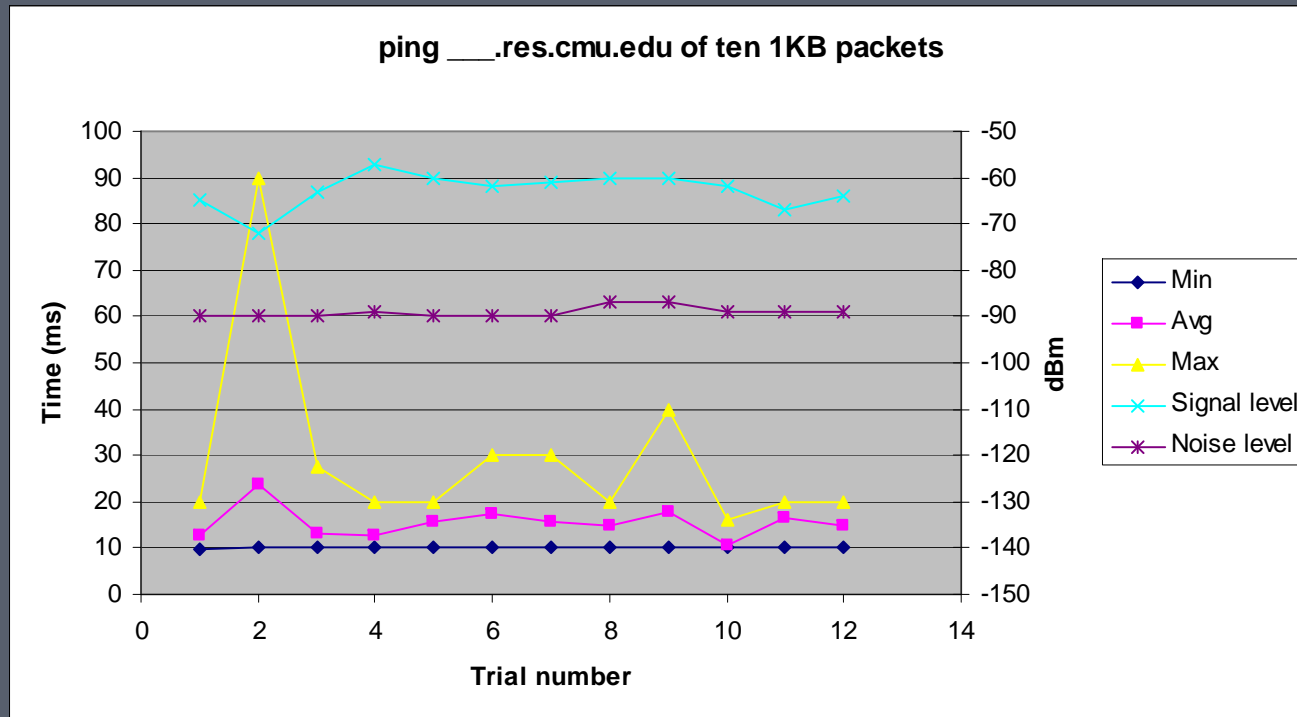**ping ___.res.cmu.edu of ten 1KB packets**

- 12 trials
- No 3SD outliers
- ping ___.res.cmu.edu (Mean, SD)
  - Min - (10.00833333, 0.079296146)
  - Avg - (15.45, 3.337255269)
  - Max - (29.45833333, 20.19394411)

- 12 trials
- No 3SD outliers
- Signal quality (Mean, SD)
  - Signal - (-62.75, 3.934116512)
  - Noise - (-89.16666667, 1.114640858)