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One Laptop per Child

Laptop Power

May 20, 2008

Challenges

- Supplying power is one of the largest and most difficult challenges in a deployment. Even in areas with a power grid
- Lack of an established power grid increases the difficulty significantly
- Each site is unique

How Much Power?

- 2 Primary modes
 - Charging battery
 - Not charging
- Charging battery
 - Max draw of 17 Watts
- Not charging
 - Less than 1 watt in sleep
 - Avg 4 – 7 watts while running w/ peaks up to 9

Charging. How Long?

- Fastest. Laptop off
 - All power used to charge battery
 - 1 hour 47 Minutes
- Laptop on
 - Excess power used to charge power
 - About 2 and half hours

Various solar panels at MAX output

- Laptop off
 - 5W 5 hours 15 minutes
 - 7W 3 hours 45 minutes
 - 10W 2 hours 40 minutes

Alternative Power Sources

- Solar
 - 5/7/10 Watt solutions
- Weza
 - Approx 30 Watt output
 - 2 Batteries in 2 hours
 - 7Ah LA battery. Will charge 2 batteries
 - Weza battery needs recharging after

Alternative Power Sources

- Crank
 - Still needs 2 hours of cranking.
 - Not really viable until Gen 2.
- Grass Roots
 - Cow power
 - Water, Wind, Pedal, Treadle

Multi-Battery Charger

- Charges 15 batteries in 2 hours
 - 300 Watt AC
 - 120 Watt DC option (10 – 28 Volt input)
 - 8 Batteries in 2 hours
 - Direct connection to 60W solar blanket(s)

Power Management

- Available today:
 - Hardware ready for suspend/resume
 - Update.1 has support for sleep on lid close or button
 - About 4 hours of battery life during normal use
 - 14-16 hours of battery life in sleep mode
- Future:
 - OHM management for suspend/resume
 - Aggressive CPU suspend
 - Suspend measurements are in the 2 watt range.

Helping OLPC

- Deployment Location Information
- Information we need
 - Whats the climate and geography of deployment areas?
 - Names of closest large city.
 - What natural resources are available?
 - How many schools, how many kids, and how many kids per class?
 - How many of those schools don't have a power grid or have unreliable power?
 - Expected laptop usage. How often will you need to recharge the batteries?