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
  – What's 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?