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One Laptop per Child

Laptop Power

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ONE LAPTOP PER CHILD



# Challenges

- Supplying power can be a large and difficult challenge in a deployment. Even in areas with a power grid
- Lack of an established grid increased the difficulty significantly
- No recipe solutions. 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 9W

# Charging. How Long?

- Fastest. Laptop off
  - All power used to charge battery
  - 1 hour 46 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
  - Current stable builds have 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
  - 8.2.x Has New “Extreme” power savings mode + additional power savings in sleep for non-mesh. (40+ hours of life in sleep)

# Power Management

- Future:
  - Automatic management of suspend/resume
  - Aggressive CPU suspend
    - Suspend measurements are in the 2 watt range.

# Helping OLPC

- Deployment Location Information
- Information we need
  - What is 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?

# Helping OLPC

- 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?