One Laptop per Child

Connectivity & Collaboration

May 20, 2008
Principles

Learning happens by interacting as much as it happens by teaching => child2child as important as child2internet
Our approach

- Standard WiFi network adapter
- Mesh Networking built on top of that
Our approach

- Collaboration software (middleware, applications and UI)
OLPC Mesh Design Goals

- low power consumption
- as transparent as possible to applications
- based on standards

- Connectivity/Range
XO Networking Architecture

Layer 2: Frames

Marvell 8388 SoC Radio

USB 2.0 Bus

Layer 3: Packets

AMD LX700 CPU
OLPC Collaboration Middleware

- Application “Activity”
- Telepathy/Presence API
- Telepathy/Presence
- Gabble
- Salut
- Ethernet
- 802.11B/G
- 802.11S
- External Jabber Server
- Local Mesh Network

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Mesh Network Gateways (portals)

- Mesh portals connect laptops to servers and an Internet connection.
Collaboration

• The ability of students to share documents and directly interact with one another
• Requires a network connection between the student’s laptops:
  – Traditional Wireless (802.11b/g)
  – Mesh Wireless (802.11s)
  – Possibly long distance
Mesh vs. WiFi

• The wireless mesh (802.11s) is an extension of traditional WiFi (802.11b/g)
• Both use the same radio spectrum
  – 3 usable channels around 2.4GHz
• Wireless mesh devices (the laptop) interoperate with WiFi devices
• Mesh does not replace WiFi (it extends it)
• WiFi should be used at Schools
School WiFi

One or more WiFi (802.11b/g) access points, connected to a central switch and school server.
Collaboration

• Presence is the ability of students to “see” if other laptops are connected to the network.
• Collaboration is the ability of students to share activities and documents they’ve created.
• Presence and Collaboration work over any network, not just a Mesh network.
Active Antennas

Installation Sheet of Active Antenna

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Attention
For having the good efficiency, the location of Active Antenna is better to place as follows:

1. No metallic items are placed nearby it.
2. For long distance transmission, the Active Antenna is needed to place in open area where does not have big barrier (such as wall, building, etc) in front of it.
3. The ambient temperature should be within -10°C and 50°C.