

1



One Laptop per Child

Networking

Principles

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

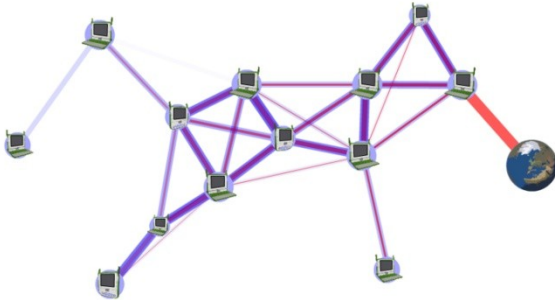


ONE LAPTOP PER CHILD



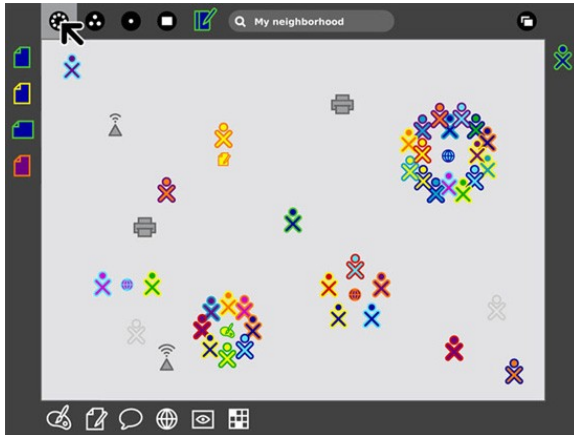
Our approach

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



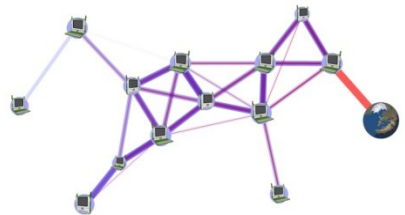
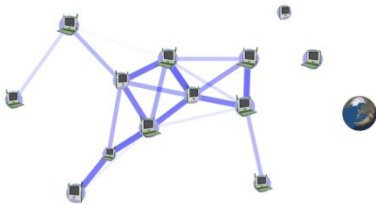
Our approach

- Collaboration software (middleware, applications and UI)

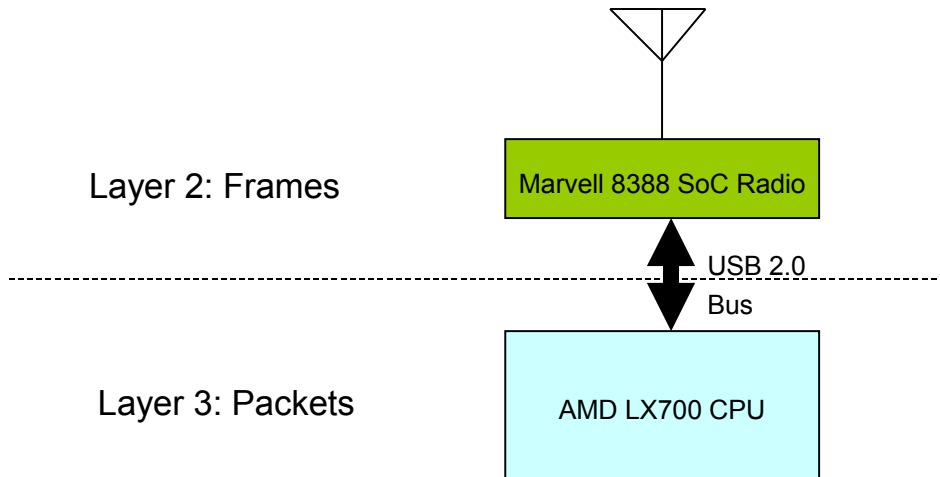


OLPC Mesh Design Goals

- low power consumption
- as transparent as possible to applications
- based on standards
- Connectivity/Range
- Does NOT replace Access Points – It complements them



XO Networking Architecture



Collaboration

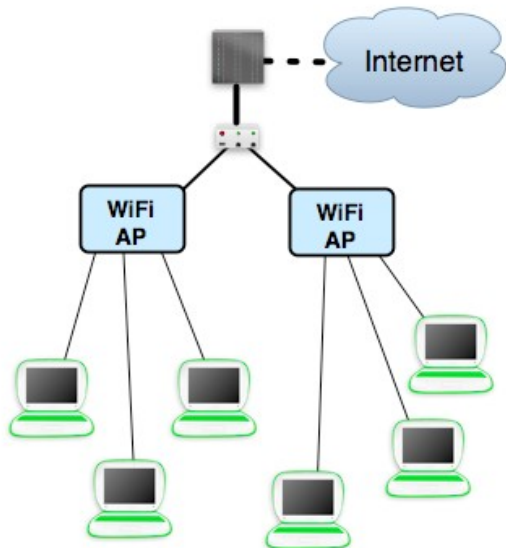
- The ability of students to share documents and directly interact with one another
- Requires a network connection between the student's laptops:
 - Traditional Wireless (802.11b/g)
 - Mesh Wireless (802.11s)
 - Possibly long distance

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

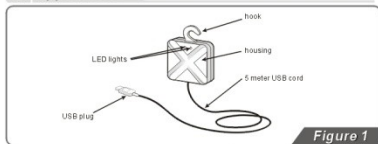
One or more WiFi (802.11b/g) access points, connected to a central switch and school server



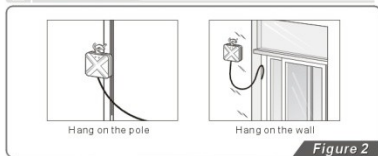
Do it yourself

Installation Sheet of Active Antenna

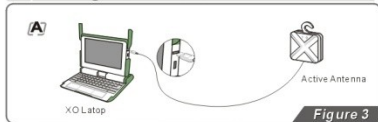
1 Appearance



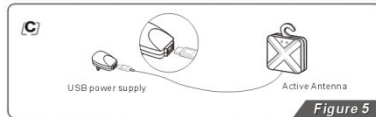
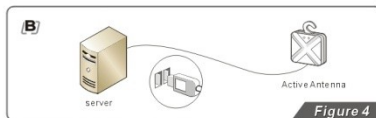
2 Installation



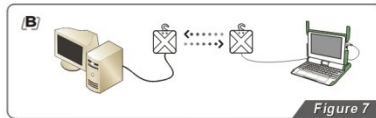
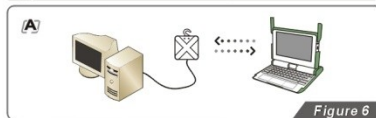
3 USB Plug Connection



OLPC Laptop

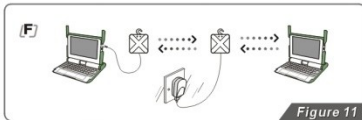
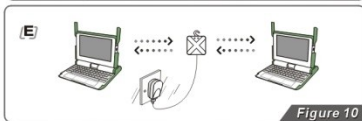
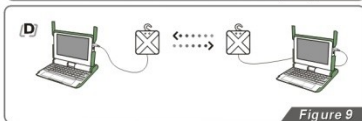
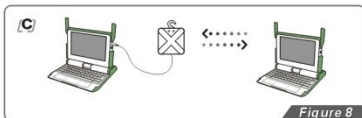


4 Network Communication

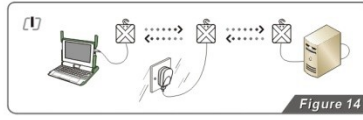
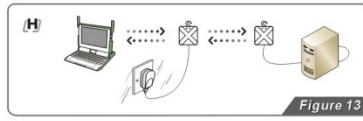
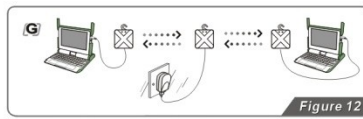


Active Antennas

Installation Sheet of Active Antenna



OLPC Laptop



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.

Connectivity Principles

- kids are a mission, not (yet) a market
- bandwidth is perishable – there is excess capacity
- 99.99% availability is not always necessary
- bottoms up along with top down
- electricity is scarce

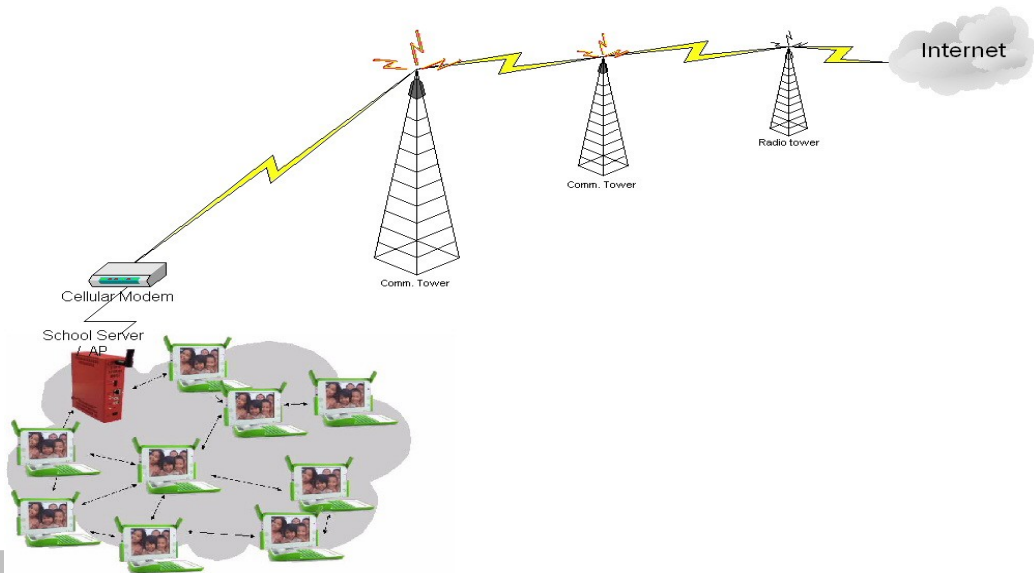
Means of Connectivity

- OLPC is technology agnostic when it comes to connecting schools and kids to the Internet
- Wireline, Wireless, Satellite are already and will be used to achieve our connectivity goals.

Examples:

- Reaksmey, Cambodia: Two-Way Satellite backhaul, local WiFi distribution between 3 schools, WiFi access within the school
- Cardal, Uruguay: DSL backhaul, Pre-WiMax point-to-point distribution link, WiFi and Mesh access within the school and the town

Example: Cellular Operator



Example: Cellular Operator

(with added point to multipoint distribution radios)

