WPAN Applications

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List of Possible Applications

- Current Applications
  - Cordless Scanners
  - Cordless Printing
- Future Applications
  - Interconnection of multiple wearable or hand-held devices
  - File transfer between several PDAs or portable terminals

Cordless Scanners

- A cordless connection is used as a "cable eliminator" to allow the user to wander around his work area.

- Point-to-point operation.

- One-way communication with an acknowledgment.

- Range up to 100 feet required.

Cordless Scanners

- Limited data rate required - 19.2 Kbps

- 10 to 15 characters every second at most.

- Scanners can be associated by scanning a bar code on the receiver.

- Scanners do not associate with a base automatically.

- Latency of 200 ms is okay. We give audible feedback before transmitting.

Cordless Scanners

- The scanner has to coexist peacefully in many possible RF environments.
  - 900 MHz Wireless LANs
  - 2.4 GHz Wireless LANs
  - Several other cordless scanners in the area.
  - Cordless phones, etc.
- Low power: 30 ma at 3 volts.
- Small size: 0.25 inch^2 to 1 inch^2

Cordless Printing

- In either a hand-held or wearable terminal we need to form a cordless connection to either a belt worn or fixed mounted printer.
- Point-to-point operation.
- One way communication with an acknowledgment.
- Range of about 20 feet required.
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Cordless Printing

- Limited data rate required - 19.2 Kbps

- 100 - 1000 characters every 3 seconds.

- Terminal can be associated by scanning a bar code on the printer.

- Terminals do not associate with a base automatically.

- Latency of 200 ms is okay.

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Cordless Printing

- The terminal & printer have to coexist peacefully in many possible RF environments.
    - 900 MHz Wireless LANs
    - 2.4 GHz Wireless LANs
    - Several other cordless terminals in the area.
    - Cordless phones, etc.

- Low power: 30 ma at 3 volts.

- Small size: 1 inch^2

Connecting Multiple Devices

- Connect
  - Hand-held or belt-worn terminal
  - Scanner
  - Printer
  - Wrist I/O unit
- Terminal acts as the master and the other devices are the slaves.
- 10 to 15 feet of range required

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Connecting Multiple Devices

- Scanner transmits bar code data to the terminal.
- Terminal sends bar code label information to the printer.
- Terminal sends display information to the wrist I/O unit.
- Keyboard information is sent from wrist I/O unit to terminal.

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Connecting Multiple Devices

- Terminal may likely also contain an IEEE 802.11 radio.
- The terminal receives message from host over 802.ll WLAN.
- The two radios inside the terminal need to coexist peacefully.
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Connecting Multiple Devices

- One form of association is for the scanner to scan a bar code on the terminal and then scan bar codes on the other peripherals.
- Low power: 30 ma at 3 volts.
- Small size: 0.25 inch^2 to 1 inch^2

File transfer between PDAs

- Two people with PDAs, portable terminals, or laptop computers, meet in any location and want to be able to exchange files.
- Data rate as low as 19.2 Kbps for PDA type applications to 1 Mbps for laptop type applications (i.e. larger files).
- Association initiated by one of the users and accepted by the other user.

File transfer between PDAs

- Point-to-point communication.
- 10 to 20 feet of range is fine.
- Latency is not an issue. Total file transfer time is concern.
- Any possible interference since you could be anywhere.
- Low power: 30 ma at 3 volts.
- Small size: 0.25 inch^2 to 1 inch^2

Sharing information in a meeting

- Multiple users (2 ~ 20 people) attend a meeting and one person would like to be able to broadcast a file to all the users in the room.
- A good example of this is the IEEE 802.11 meetings. (In that case the number of users could be much higher).

Sharing information in a meeting

- The master broadcasts to the slaves.
- The master could change since different people may want to transmit a file at different times.
- Association should be initiated automatically when you are in the area.
- The user accepts association with the network.

Sharing information in a meeting

- Data rates as high as 1 Mbps would be useful if the files are large.
- Latency is not an issue. Total file transfer time is concern.
- Any possible interference, since you could be anywhere.
- Low power: 30 ma at 3 volts.
- Small size: 0.25 inch^2 to 1 inch^2

Broadcast Information for People Entering a Location

- When a user, who is carrying a PDA, enters a location (e.g. store or office room), he receives messages.
- Association is automatic.
- Some information is passed in the association request signal.
- User accepts association either manually, or for some applications, automatically.

Broadcast Information for People Entering a Location

- Master-slave configuration, with fixed transmitter acting as master, and the users with their PDAs, being slaves.
- Information (e.g. advertising) is broadcast.
- Users can act on the information.
- Latency is not a major issue.
- Message sizes are likely under 1 Kbytes.

Broadcast Information for People Entering a Location

- 19.2 Kbps is probably fine.
- Interference could include WLAN and cordless phones.
- Low power: 30 ma at 3 volts.
- Small size: 0.25 inch^2 to 1 inch^2
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