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Reducing the Power Consumption: Coolspot using Wi-Fi

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Abstract— The CoolSpots system enables wireless mobile devices automatically that switch between radio interfaces such as WiFi and Bluetooth and also helps to increase the battery lifetime. The main objective of this paper is to discover the strategies that facilitate a scheme to switch among the interfaces and offer a quantitative gauge. The scheme and the strategies will not need any alteration to the employment of CoolSpots, and the modification to the present infrastructure will be the least. Outcome will be accessible for typically used execution like file relocation, streaming media and web browsing.

Keywords— Bluetooth; Wi-Fi; Coolspots.

1. Introduction

In latest mobile instruments like smart phones and PDA, the wireless channel subsystem is accountable for the important segment of the total power expenditure. These types of devices are gradually more operational with numerous radio interfaces to use diverse links like Bluetooth for the private area, WiFi is in local area, and GPRS for used wide-area. The idea of a switching among the radio interfaces to save the power consumption has been researched before. By using the suitable radio for the chore, overall battery existence can be comprehensive. For an example, functions with a low network obligation can use the stumpy power or stumpy bandwidth interface and animatedly switch to the lofty power or lofty bandwidth interface if essential. CoolSpots discover the policies necessary to facilitate switching amid interfaces.

The aids of this work is the CoolSpots model that express the features of employing several radio interfaces on caring the diverse broadcast ranges into the description, and a group of strategies to direct the automatic switching depends on the diversity of metrics. The CoolSpots scheme does not need application modification, or a great possibility to the infrastructure, producing it as a quite easy system to arrange and incorporate into the existing system.

2. Literature Survey

2.1 A Case for WiFi Relay: Improving VoIP Quality

- WiFi relay

2.2 WiFi Access Point Deployment for the Efficient Mobile Data Offloading

- WiFi Access Point
- Offloading Of Data

2.3 Receiver Design for Realizing the On-Demand WiFi Wake-up Using WLAN Signals

- Wake Up signals
- WiFi Interface

2.4 Placement Of WiFi Access Point for Efficient WiFi Offloading In An Overlay Network

- WiFi cells
- WLAN

2.5 CoolSpots: Reducing the Power Consumption of the Wireless Mobile Devices with Multiple Radio Interface Review

- Bluetooth
- PSM
- Energy consumption

Network requisite for cooperation and interactive using extra nodes and cooperation between nodes to relay material to the base is connected with the single-chip. The main impartial of this average is to make available connectivity between low-power wearable and implanted strategies while supportive high data rates (up to 10Mbps) as well as quality of service [1]. *Disadvantage:* It consumer more energy. Decrease the network lifetime.

3. Energy Consumption

- Wifi provides local-area coverage with high-bandwidth of 100 meters, while the Bluetooth provides a low-power usage of a communication effective up to 10 meters.
- The CoolSpots project aims to use both the radios to provide a single logical wireless channel improves the power consumption.

While WiFi offers much higher bandwidth than the Bluetooth 11 Mb / s for 802.11 b Wifi, and 1Mb/s for he

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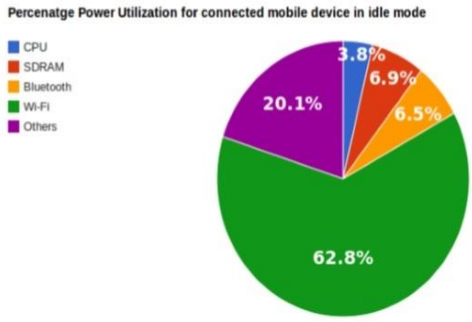

Fig.1: Percentage of power consumption for the connected mobile device in idle mode

Bluetooth use considerably more power through the active data transfer 890mW for the Wifi, and 120mW for the Bluetooth. This dissimilarity in power usage is because of the Bluetooth having a limited range, and simpler radio architecture. Even the radios in an idle state it consume a significant amount of power. The typical use of mobile phones in that wireless device is actually communicating in a small percent of time when the device is on.

- Bluetooth is optimized and runs at only a 2% power duty-cycle, and also consuming only 1mW, while the remaining is discoverable and ready for the connection setup.
- WiFi on other hand, consumes around 250mW even with power saving mode (PSM) enabled.

4. Cool-spots

The cool spots system enables the wireless mobile devices to switch between the radio interfaces such as WI-FI and bluetooth, helping to increase the battery lifetime.
It save more than 50% energy consumption of the wireless subsystem.

- Cool spots is a combination of WI-FI and bluetooth to provide improved communication capabilities for the mobile devices within a cool spots enabled region.

CoolSpots provides a concrete implementation of the generic concept for using the multiple radio interfaces, and easily integrates with the existing applications, systems, and devices. Based on the idle power consumption of WiFi and Bluetooth radios, it has a potential to reduce the power consumption tenfold for an idle system.

- CoolSpots takes the bandwidth requirement, power, and the distance into account in determining the optimal radio configuration.
- To help to save the power the WiFi radio can be turned off when not being used.

A CoolSpots facilitated base station supply the Bluetooth potential and can be added to an accessible WiFi network, permitting mobile devices within reach for power save.

- By employing the network routing changes, the base station can route traffic to mobile devices.
- The CoolSpot prototype co-locates the Bluetooth and the WiFi radios in the same place, but this is not a requirement.
- The Bluetooth and the WiFi radios could be in an different physical locations, and if a mobile device is not close enough to a CoolSpot and wants to save the power, it can fall back to the WiFi using PSM mode.

The core of the CoolSpots model is the policies determining when to switch between the radio interfaces. There are two key decisions.

- When to “switch-up” to WiFi .
- When to “switch-down” to Bluetooth.

The penalty for switching the latency and energy overhead of de/activating the WiFi interface. The basic question is when there is not enough bandwidth available on the Bluetooth channel, and when there istoo much unused bandwidth on the WiFi channel. This problem warrants a more complex answer than using static the threshold, due to the optimal bandwidth doorsill altering as the remoteness between devices.

5. Conclusion

CoolSpots is used within the range of both WiFi and Bluetooth access points—both of which requires power from a wall socket. Also all of their examples had the home entertainment centers with the access points, and most people who own cell phones also own a laptop and desktop computers at their homes which are much more convenient to use for network activity. Wi-Fi can be used efficiently in APs by allowing it to sleep during no traffic periods.

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