An Rssi-Based Wifi Access Management Approach for Energy Saving on Smartphones

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***Abstract*—The abstract goes here.**

***Index Terms*—Rssi, Energy saving, algorithm.**

I. Introduction

GUIDANCE: This paragraph is to address 1) the growth of the multimedia applications on smartphone [Need some data evidence], and most need download large files, e.g., app tar files and movies etc. 2) the wifi access requirements for those applications, and 3) major Wifi properties and the impact on the critical energy issues on resource-constrained smartphones.

[**Guidance:**] 1) The most widely used energy-efficient wifi access strategies, such as prediction sleeping methods are introduced here, 2) The limits or problems of those strategies.

[**Guidance:**] The contributions of this paper: 1) extensive experiments to evaluate the relationship of rssi and the energy consumption, 2) propose a novel Rssi-based wifi access management algorithm, 3) effectiveness evaluation using simulations.

II. Evaluation of Rssi and Energy Consumption

A. Settings and Methodology

[**Guidance:**] Experimental environment and settings

B. Experimental Setup for Rssi Charactirization

C. Experimental Setup for Power Measurement

This section describes the experimental setup for power measurement. The Android smartphone used is a Huawei 8950D with superuser access. Its hardware specifications are shown is Table 1. The smartphone is equiped with Iptables and Tcpdump that are cross compiled. (Or to sayWe cross compile Iptables and Tcpdump and install them into the smartphone as local libararies). Iptables is used to block the Internet access of unrelated applications to avoid GANRAO traffic. Tcpdump is used to analyse traffic information when downloading files at different Rssi.

We use a Monsoon Power Monitor for power measurement. The measurement instruments are illustrated in Figure 1. The Monsoon Power Monitor supplies a stable voltage of 3.7V to the smartphone and samples the power consumption at a rate of 5KHz.

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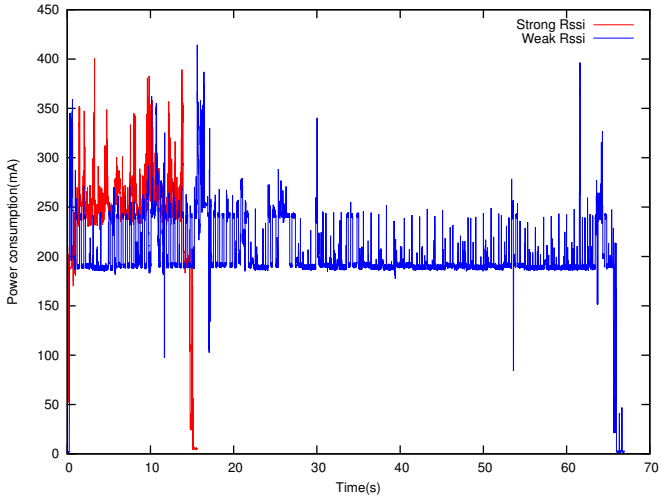

Fig. 1. Power consumption for downloading a file (11.4Mb) in different Rssi

We adjust the distance between the smartphone and the AP to get different Rssi. When we perform measurements, we keep all instruments at fixed location. We develop an application (WiDownload) that download files using the DownloadManager API provided by Android. We use Iptables to block the Internet access of all applications except that of WiDownload so that no GANRAO traffic is introduced. During the download, the screen is off and the WifiLock is aquired.

We measure the power consumed for completing downloading a file of 11.4 Mb. After this, we perform a same download at the same fixed location, but with Tcpdump running to dump traffic information. Each measurement is repeated 3 times. After that, we move the instruments to another location where the Rssi is different and reconduct the experiment.

[**Guidance:**] We measure....

D. Results

Put the figures and analysis here.

Figure 1 shows the power consumption for the download at strong (-30 dBm) and relatively weak (-80 dBm) Rssi.

Figure 3 and 4 are the corresponding traffic throughput.

The whole dataset is plotted in Figure 5. We

We conclude that when the Rssi is weak, the energy consumption for downloading files increases drammatically. One straight-forward propostion for energy saving is to close the Wi-Fi interface when Rssi is weak and re-opening is when Rssi is strong. To invastigate the possiblity of this solution, we measure the energy consumption for opening and close the Wi-Fi interface. The measurement result is shown in Figure 6.

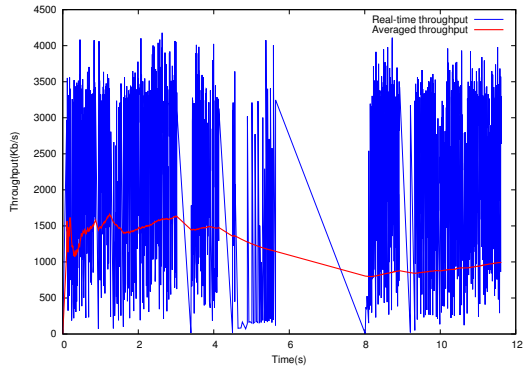

Fig. 2. Throughput in strong Rssi

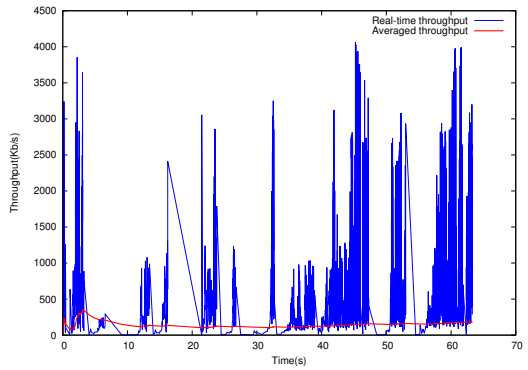

Fig. 3. Throughput in weak Rssi

III. RSSI-BASED WIFI ACCESS ALGORITHM

Algorithm statement and pseudo-code

IV. SIMULATION RESULTS

[Guidance:] Simulation Methodology
[Guidance:] Comparison results

V. CONCLUSION

The conclusion goes here.

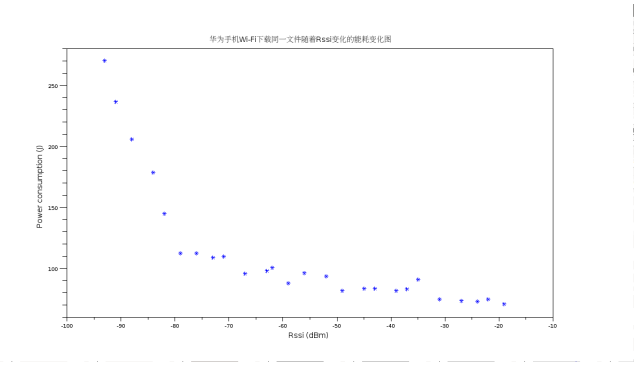

Fig. 4. Energy Consumption is different Rssi

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