**Evaluation on Lifetime of Wireless-Powered Communication Networks**

**Descriptions**: A wireless powered communication networks (WPCN) in which a radio signal enables wireless energy transfer is a promising technology to prolong network lifetime without operation interruptions. Compared to conventional battery-powered wireless networks, WPCN eliminates the need for manual battery replacement or recharging. Compared to opportunistic energy harvesting (EH) approaches in which end devices harvests energy from nature such as solar, wind power, vibration, WPCN is more stable due to the possibility of full control over transmitting power, waveforms, and occupied time or frequencies dimensions.

A typical WPCN consists of a data center (DC), an energy source (ES), and a number of wireless end-device (WD), as shown in Fig. 1. In a WPCN, an ES transmits power to a number of WDs via a radio frequency. Since the ES is shared among WDs, a power scheduling algorithm which determines the transmitted power from the ES to each WD and the duration for power transmission is important. The algorithm strongly affects how much energy that a WD can harvest and consequently the overall network lifetime. This project aims to evaluate the performance of some power scheduling algorithms in terms of network lifetime, scalability, and algorithm complexity.

Diagram

Description automatically generated

Fig.1. WPCN network architecture

The project consists of the following steps:

1. Exploring some power scheduling algorithms (the algorithms will be provided).

2. Evaluating the performance of each algorithm in terms of network lifetime, scalability, and algorithm complexity.

**Requirements**: Students do not need to have prior knowledge about WPCN was well as power scheduling algorithms. All will be provided and explained. However, students need to good at least one programming language, C is preferrable.

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