

8 - 43 Time Performance Optimization for Master Node with WRS*

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The master node of the White Rabbit system (WRS)^[1] is the core device that sends down control message. It is a Zynq chip running a Linux kernel. Its function is to package the control data and time information then pass it to the logic unit on the PL side. The logic unit encapsulates the data and sends it to downstream devices. The improvement of the time performance of sending data on master node is an important part for the time performance of the entire WRS. Therefore, we have optimized the time performance of the master node from 3 times per second (3 Hz) to 100 times per second (100 Hz). As can be seen from Fig. 1 (above), before optimization, the number of times sent by the master node at 10 Hz is slightly less than 1 000 times, and the time interval of sending is large. 20 Hz, 100 Hz is especially noticeable. After optimization, the master node stably transmits 1 000 times of data in the three states of 100, 20 and 10 Hz, and the amplitude and number of time interval shaking are greatly reduced.

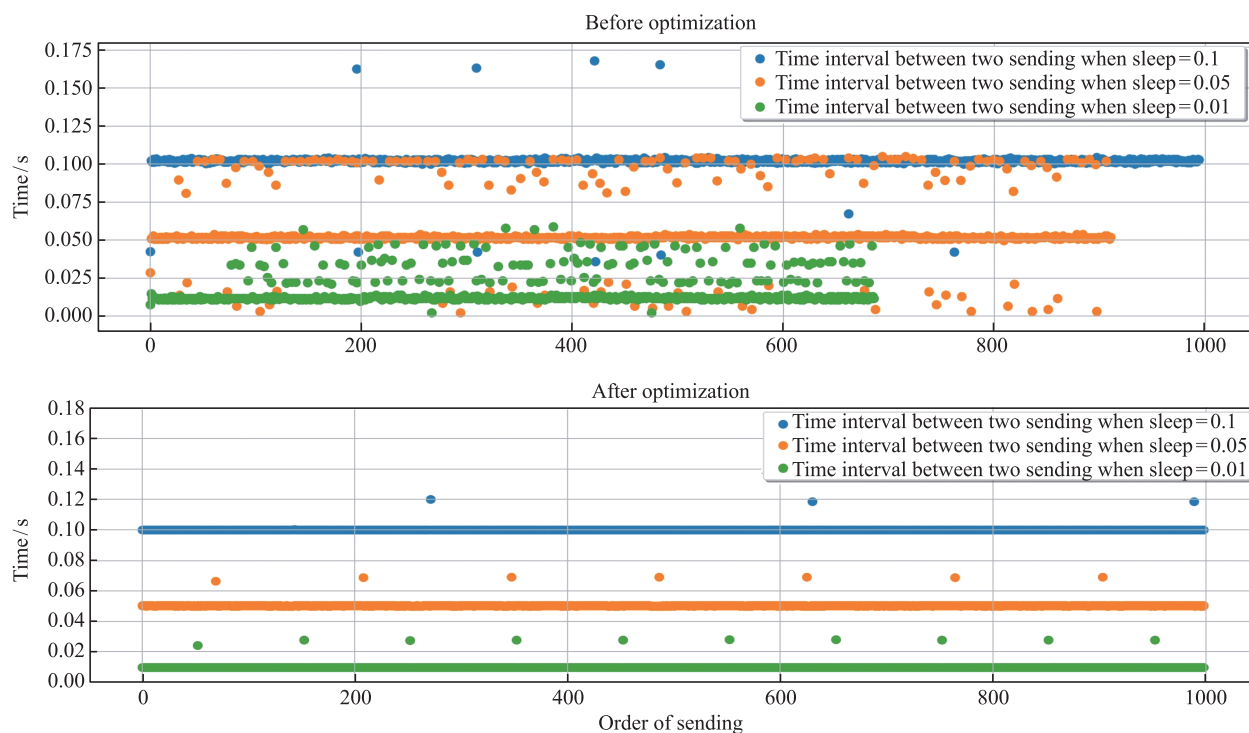


Fig. 1 (color online) Master node optimization.

The above figure shows the situation when the master node sends 1 000 sets of data 10 s, 20 s, and 100 times per second before optimization, where each point represents a data sending, the y axis is the time consumed by the sending, $x = 1$ corresponds to the first sending, $x = 10$ corresponds to the 10 th sending. The below figure shows the situation when the master node is optimized to send data 10 s, 20 s, and 100 times per second, for a total of 1 000 times.

Reference

- [1] J. Serrano, P. Alvarez, M. Cattin, et al., The White Rabbit project [C]//Proceeding of ICALEPCSTUC004.Kobe, (2009).

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