

# IEEE 802.15.4 packet analysis with Wireshark and off-the-shelf hardware

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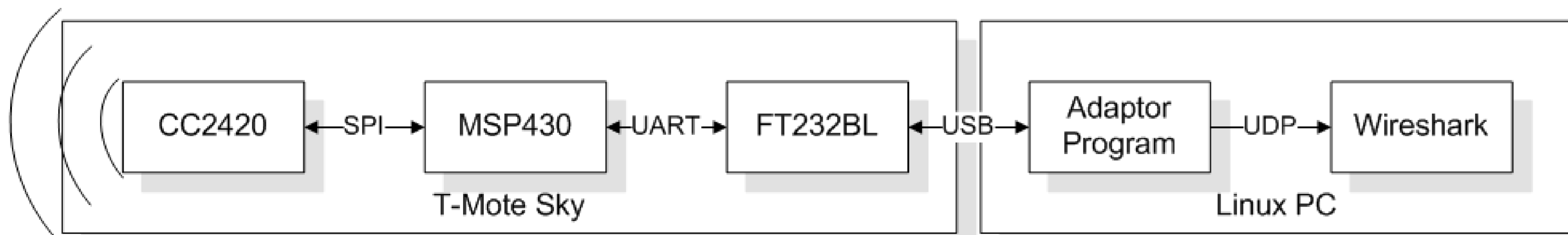
## Motivation

For the development of protocols, it is essential to have a good and powerful protocol analyzer at hand. When it comes to developing low-level protocols for Wireless Sensor Networks using IEEE 802.15.4-based radios, the choice of packet analysis tools is limited. Commercially available hardware is expensive and typically not available when you need it. In addition, the necessary tools are often closed source and therefore not customizable to one's specific need.

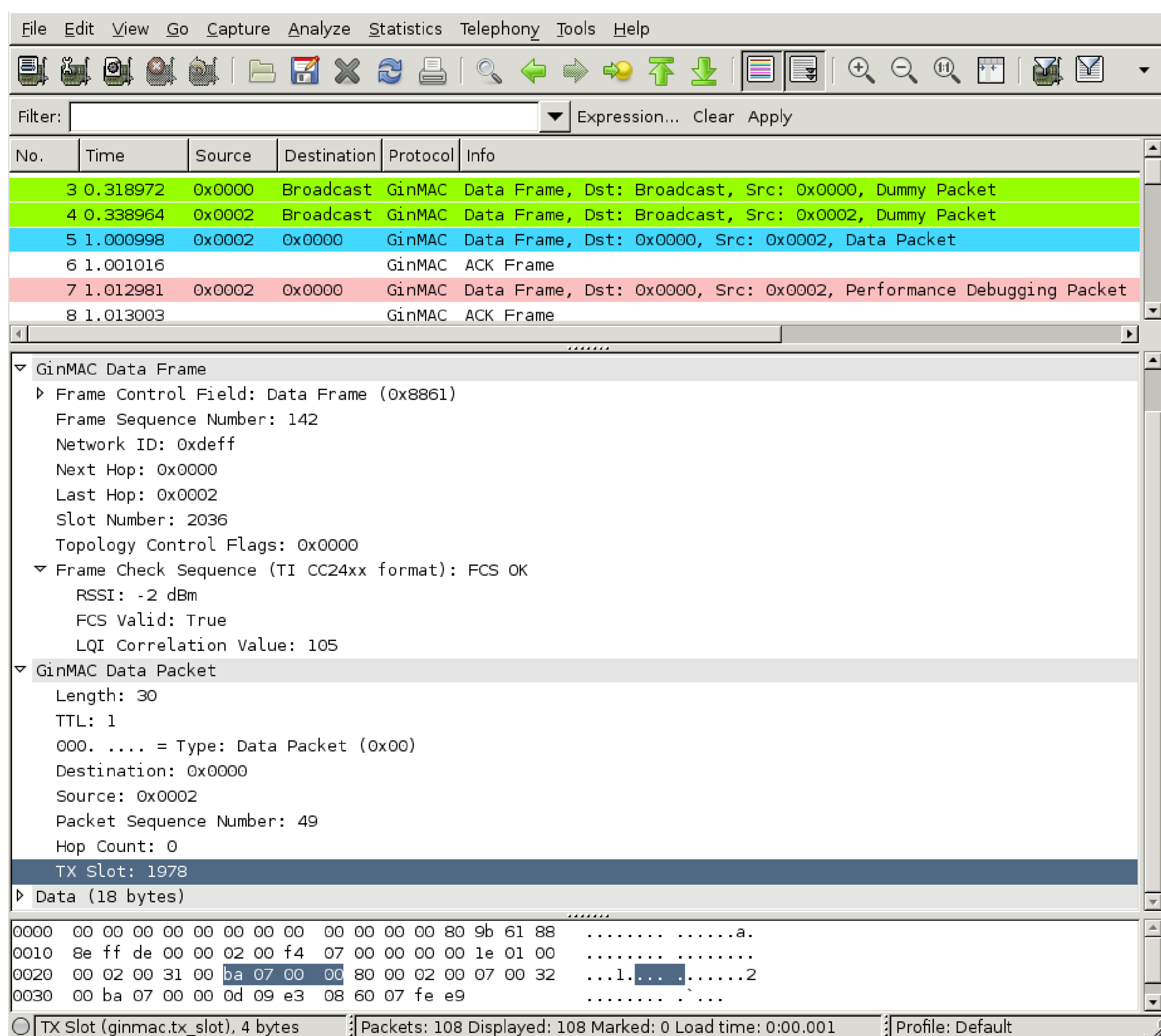
## Concept

In this demo we show how to use off-the-shelf hardware for wireless packet analysis. The idea is to run a program on a standard node that receives radio packets and sends them over the serial line. An attached PC runs a program that receives the packets on the serial line and feeds them into Wireshark via Raw ethernet frames on the loopback interface or using UDP packets. In addition, we propose to modify Wireshark to analyze packets of currently unsupported (i.e. custom) protocols. One advantage of this approach is to use the homogenous hardware support of Contiki, since only minimal modification of the radio driver are necessary.

## System Architecture

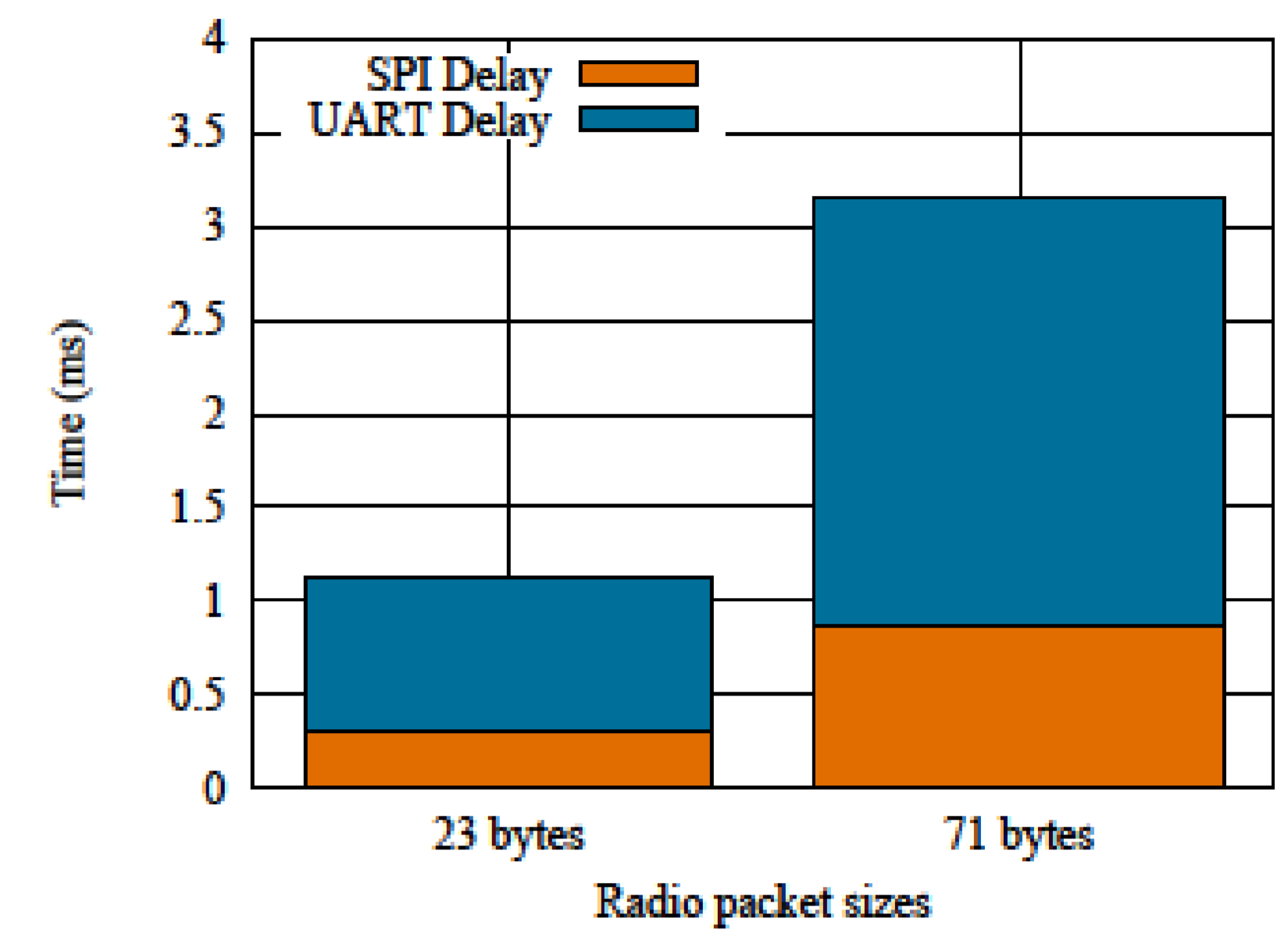


## Custom Dissector Screenshot



## Timing Analysis

■ T-Mote Sky, CPU Clock: 3.9 Mhz, Contiki 2.4



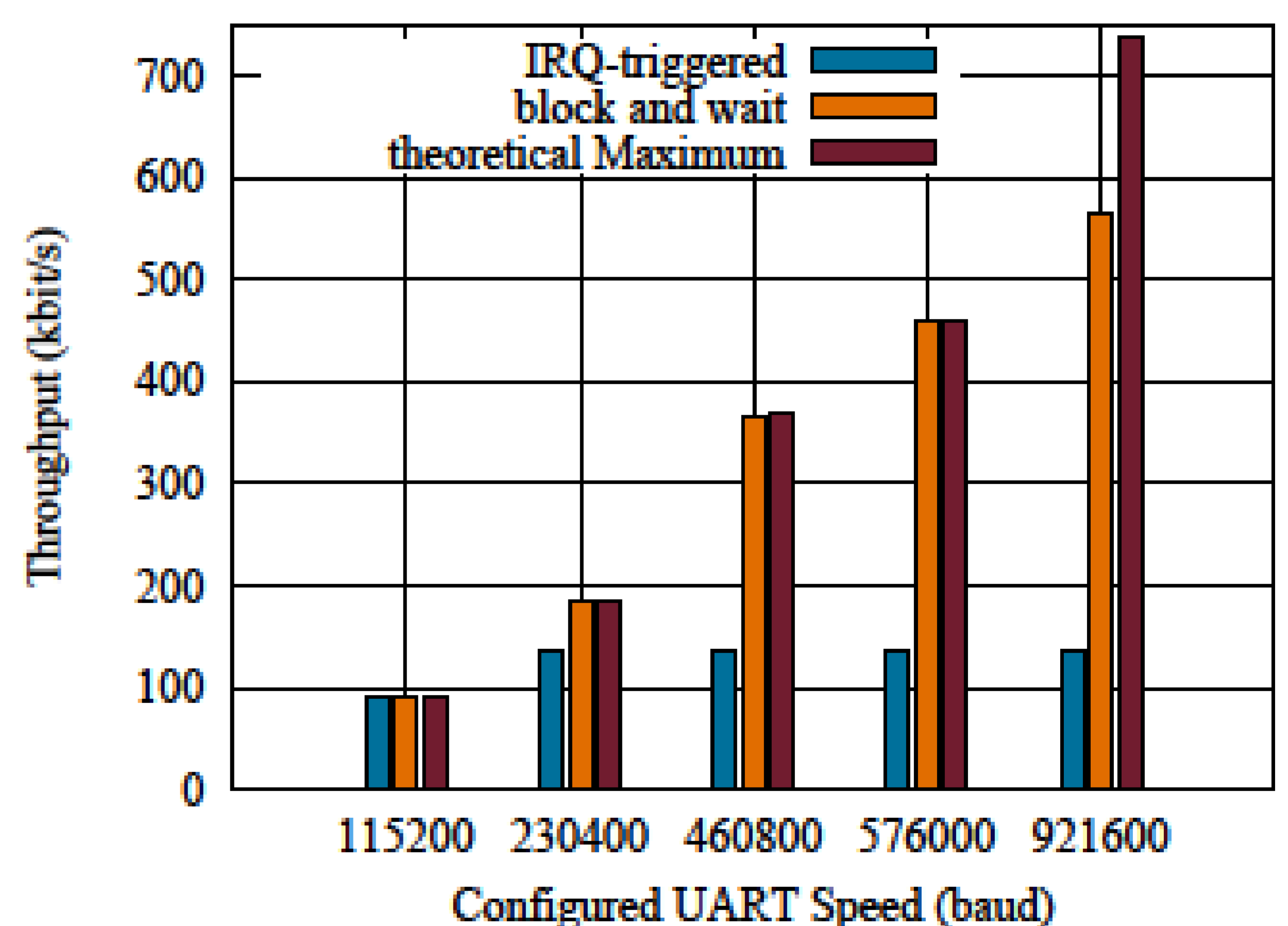
## Serial Port Reliability

■ MSP430 CPU Clock: 3.9 Mhz, Node to PC

UART Speed	Bytes transmitted	Bytes corrupted
115200 baud	165148200	0
230500 baud	164834682	0
460800 baud	164492850	0
576000 baud	164492850	0
921600 baud	164492850	0

## MSP430 Serial Port Throughput

■ MSP430 CPU Clock: 3.9 Mhz



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