

hardware described previously. Suppose that the global hashrate decreases significantly, even for a moment, he can now use his mining power to fork the chain and double-spend. As we shall see later in this article, it is not unlikely for the previously described event to take place.

## 2.3 Irregular emission

Bitcoin has a predetermined emission rate: each solved block produces a fixed amount of coins. Approximately every four years this reward is halved. The original intention was to create a limited smooth emission with exponential decay, but in fact we have a piecewise linear emission function whose breakpoints may cause problems to the Bitcoin infrastructure.

When the breakpoint occurs, miners start to receive only half of the value of their previous reward. The absolute difference between 12.5 and 6.25 BTC (projected for the year 2020) may seem tolerable. However, when examining the 50 to 25 BTC drop that took place on November 28 2012, felt inappropriate for a significant number of members of the mining community. Figure 1 shows a dramatic decrease in the network's hashrate in the end of November, exactly when the halving took place. This event could have been the perfect moment for the malevolent individual described in the proof-of-work function section to carry-out a double spending attack [36].

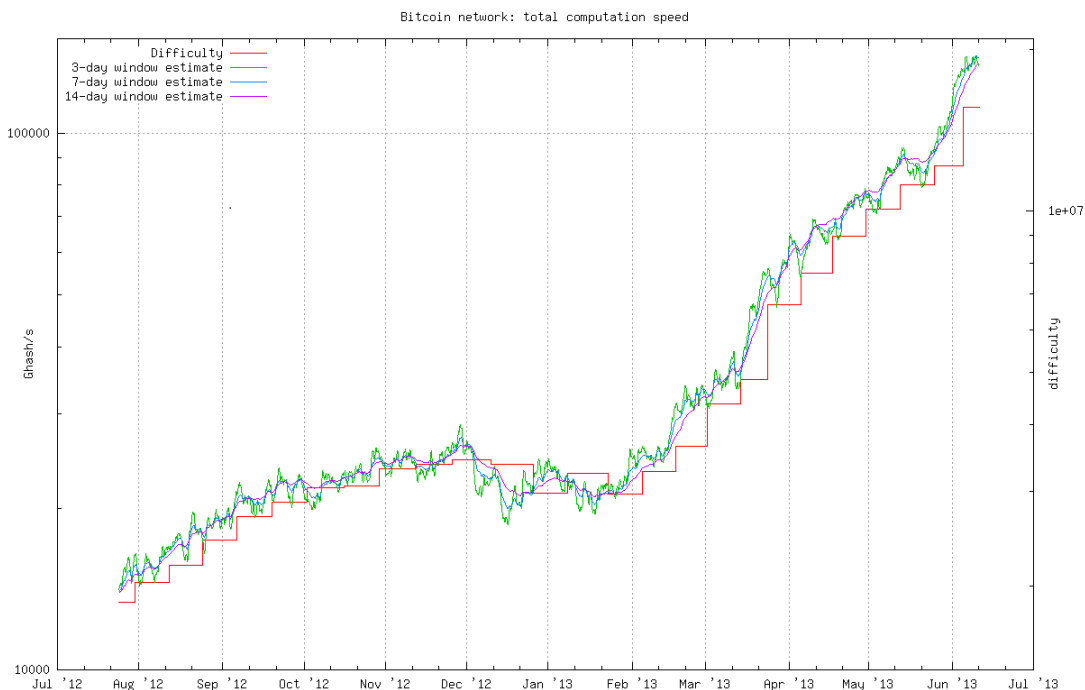


Fig. 1. Bitcoin hashrate chart  
(source: <http://bitcoin.sipa.be>)

## 2.4 Hardcoded constants

Bitcoin has many hard-coded limits, where some are natural elements of the original design (e.g. block frequency, maximum amount of money supply, number of confirmations) whereas other seem to be artificial constraints. It is not so much the limits, as the inability of quickly changing