New Russian Hash Function Standard

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New Russian National Hash Function Standard

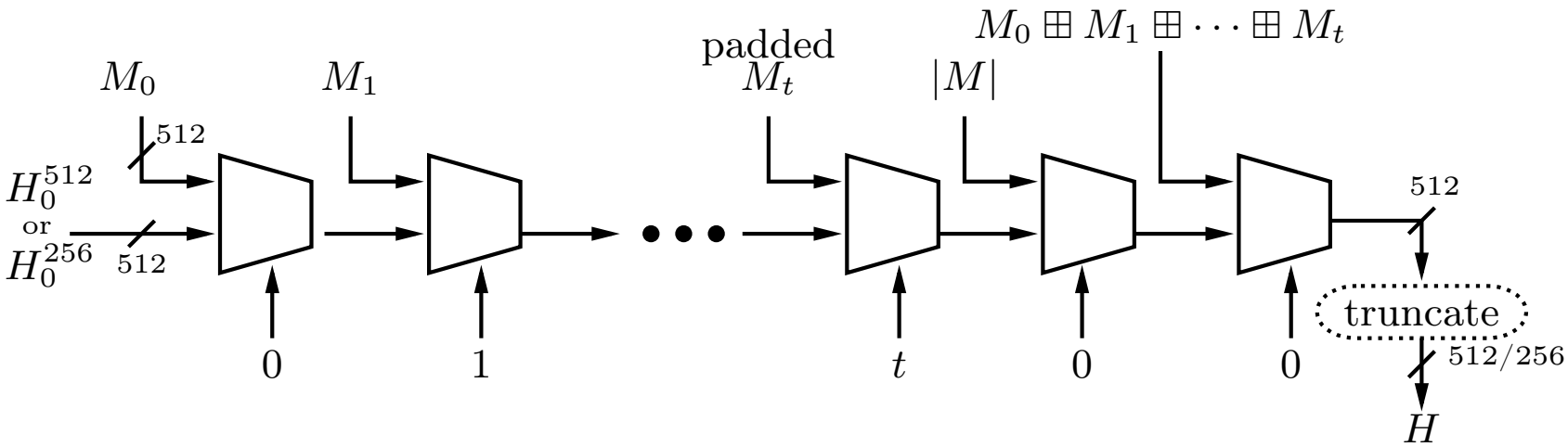
- based on **Stribog** (pronounced [`stri:bog]) hash function;
- approved on August 07, 2012;
- put into effect on January 01, 2013;
- replaces the old version that no longer fits performance and security requirements;

Design approach

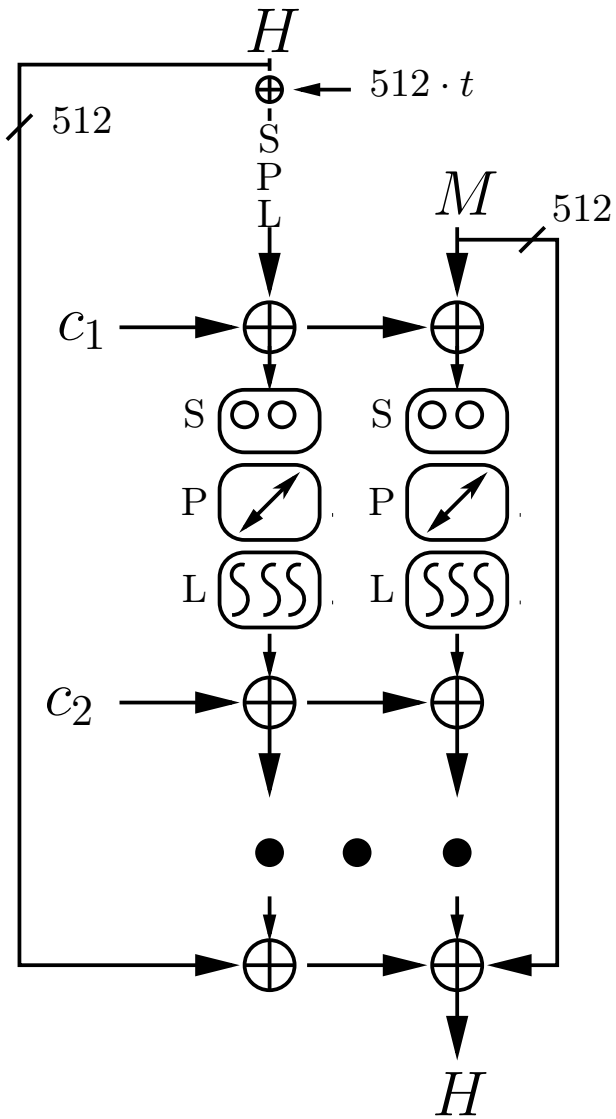
- well-studied and time-tested constructions;
- no redundancy: each transformation adds to security;
- resistance to all known attacks;
- large security margins;

Basic Construction

- two output lengths — 256 and 512
- fixed IV (different for different output lengths)
- MD-based single pipe hash
- MD-strengthening: additional hashing with
  - the length of the hashed message;
  - the sum modulo 2^{512} of all message blocks;



Compression Function



- Miyaguchi-Preneel scheme.
- SP-network both in key schedule and state transformation.
- 13 rounds
  - message/constant addition,
  - S-box layer,
  - transposition,
  - columnwise diffusion,
  - wide trail design strategy.
- Compression function takes the block counter as input.

GOSTbusters are welcome!

And also rebounders, meet-in-the-middlers, integrators, etc.

- Authentic reference description
  https://www.tc26.ru/en/
- Authors' design principles and rationale
  https://www.tc26.ru/documentarymaterials/CTCrypt2012/slides/STRIBOG.pdf