KangarooTwelve
draft-viguier-kangarootwelve-02

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Yet another hash function?

No RFC exists with a hash function that . . .

- supports arbitrary output length: XOF rather than a hash function
- provides **scalable parallelism** increasing with input size
- is based on a permutation that won the open worldwide SHA-3 competition
  - reuse of code and/or hardware for FIPS 202, (e.g. in ARMv8.2 instruction)
  - inherently **faster** than FIPS 202 and SP-800-185
- is a public design **and** has vast amount of 3\textsuperscript{rd} party cryptanalysis
  - 35 third-party cryptanalysis papers in 10 years of Keccak/SHA-3 cryptanalysis (https://keccak.team/third_party.html)
  - more cryptanalysis than SHA-256 and/or SHA-512 (we counted about 21)
- For reduced-round Keccak, best attacks seem to stabilize to
  - 5 rounds for collision and (second) preimage attacks
  - 8 rounds for distinguishers

KangarooTwelve has 12 rounds.
Why is it interesting for the IETF?

- **Keccak/KangarooTwelve** is an open design
  - Public design rationale
  - Result of an open international competition
  - Long-standing active scrutiny from the crypto community

- Best security/speed trade-off
  - Speed-up w/o wasting cryptanalysis resources
  - Proven generic security (sponges, tree)

- Scalable parallelism
  - As much parallelism as the implementation can exploit
  - Without additional parameter