Open Discussion

NIST Lightweight Cryptography Standardization Process

NIST Lightweight Cryptography Team

NIST Lightweight Cryptography Workshop, October 21, 2020

National Institute of Standards and Technology
U.S. Department of Commerce

INFORMATION TECHNOLOGY LABORATORY

Next Steps – Timeline

- Announce the finalists in December 2020 (tentative)
- Publish the report explaining the selection process in January 2021 (tentative)
- Publish guidelines for the submission package of the final round (on tweak selection etc.)
- Publish the updated packages in January 2021 (tentative)
- Final round to last about a year

Any comments/questions on the tentative deadline and process?

Selection of the Finalists

- More challenging compared to going from Round 1 to Round 2.
- From 32 candidates to (around) 8 finalists.
- Selection will be based on security, software & hardware benchmarks, additional features etc.
- Diversity of the finalists is another consideration.

Any comments on the target number of finalists?
Diversity as an evaluation criteria?

Security

- *Are any of the security claims of the submitters invalidated by third-party analysis?*
- *Are there undesired properties that might later lead to attacks?*
- *Is the candidate mature enough for standardization?*
- *Is the candidate based on a well-analyzed design approach, or use well-analyzed components?*
- *Do the designers plan to tweak the candidate? How big are the planned changes? What is the purpose? (based on status reports)*

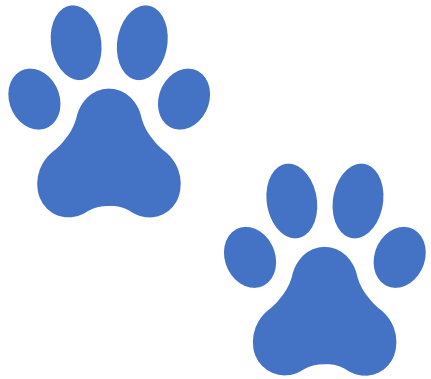
Any comments?

Benchmarking

- *Does the candidate have optimized software and hardware implementations?*
- *Does the performance of the benchmarked implementations reflect the performance of the candidate in the field?*
- *Does the candidate perform better than AES-GCM and SHA256 in target platforms?*

- *Do the benchmarking platforms match with target applications? Do we need additional platforms?*
- *Are the software/hardware benchmarks mature enough to fairly evaluate candidate?*
- *Should SHA-3, SHAKE and small Keccak be included in benchmarking?*
- *How to benchmark AEAD and hashing together?*

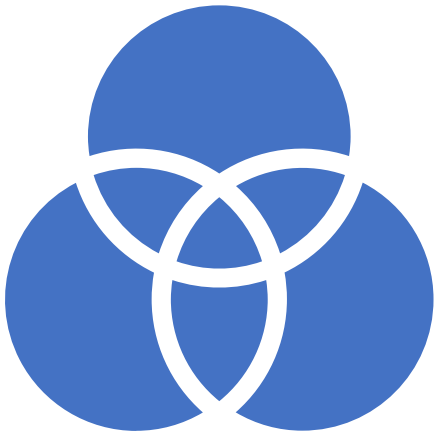
Masked/Protected Implementations



- *Does the candidate have protected implementations?*
- *What is the performance overhead for side channel protection?*
- *Does the design lend itself to side-channel resistant implementations (e.g., leakage resilient, threshold implementations)?*

At this stage, how much weight should be given to protected implementations on the finalist selection?

Additional Features

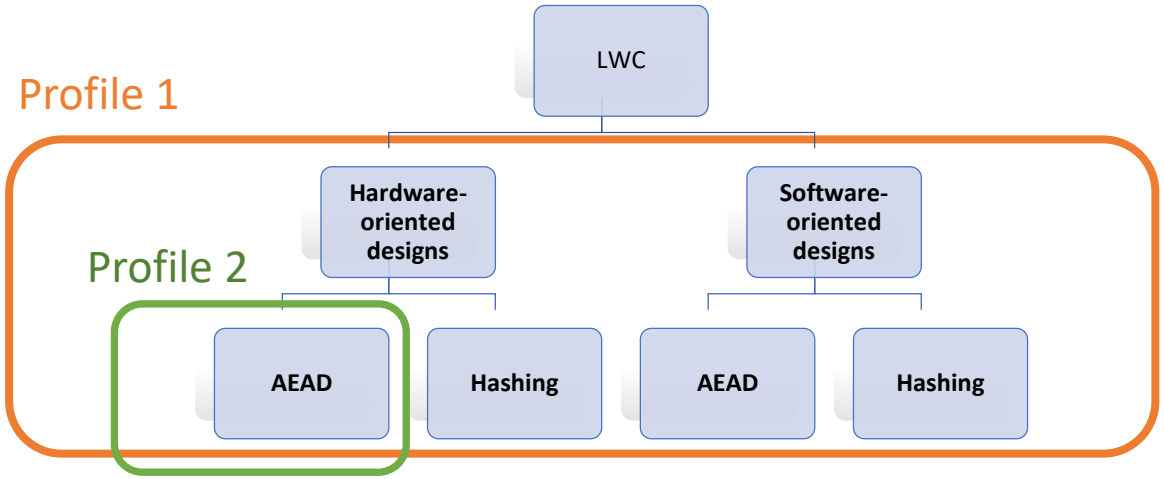


Does the candidate have additional features?

- *Variants supporting different key/tag sizes*
- *Nonce-misuse resistance*
- *RUP-security*
- *Related-key security*
- *Multi-user security*
- *Etc.*

How much weight should additional features have on the finalist selection?

Damian Vizár: “*The criteria for the selection of 3rd round candidates did not contain a mention of the lightweight use cases and constraints, which motivate the LWC project. I'd like to ask how will these be factored into the decision?*”



Thanks!

https://csrc.nist.gov/Projects/lightweight-cryptography

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