

Masked PAKE Implementation using Mithril as a KEM

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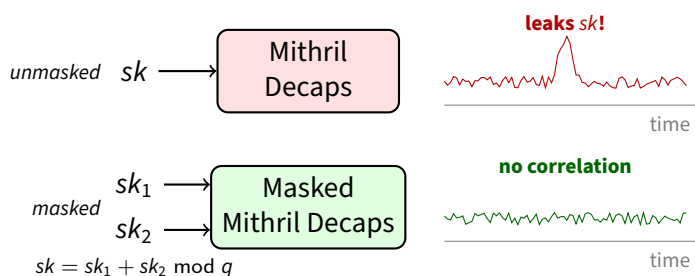
Motivation

Attackers can learn about a secret being computed by measuring the power it takes to compute a function. Hence, having masked implementations of algorithms is crucial. Password Authenticated Key Exchange protocols are useful in establishing more secure session keys before there is an authenticated channel available. Concrete use cases include wireless networks and identification cards.

In this topic, you will explore performant masked implementation of PAKE scheme using Mithril as the Key Encapsulation Mechanism. Mithril is a new KEM algorithm that is similar in construction to SABER and ML-KEM (formerly Kyber).

Goals and Tasks

-  Understand Mithril KEM scheme
-  Identify the vulnerable procedures
-  Implement an efficient masked implementation



Abstract view of masked versus unmasked implementation.

Literature

- > [J. Renes et al.](#)
Radical Ring-LWR: Efficient Key Encapsulation and Signatures from Structured Rounding
2026
- > [M. Green](#)
Let's Talk about PAKE
2018
[blog . cryptographyengineering . com / 2018/10/19/lets-talk-about-pake/](https://blog.cryptographyengineering.com/2018/10/19/lets-talk-about-pake/)

Courses & Deliverables

- ☒ **Master Project**
Project code
Report
Presentation

– OR –
- ☒ **Master's Thesis**
Initial presentation
Project code
Thesis (60+ pages)
Final presentation

Recommended if you're studying

- ☒ CS ☒ ICE

Prerequisites

- > Interest in secure implementations
- > Programming (Cortex-M4 Assembly, C/C++, Python)

Advisor Contact

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