



IETF Hackathon

Post-Quantum Encrypted Client Hello

IETF 118

4–5 November 2023

Prague, Czech Republic



Hackathon Plan

- Making TLS 1.3 Extension “Encrypted Client Hello” *Quantum-Resistant*
- RFC’s and drafts involved:
 - [RFC 8446](#) - TLS version 1.3
 - [RFC 9180](#) - Hybrid Public Key Encryption (HPKE)
 - [draft-ietf-tls-esni-17](#) - Extension Encrypted Client Hello
- Used WolfSSL + liboqs as our base implementation
- Added *Post-Quantum* algorithms in HPKE and eventually in ECH
- PQ-ECH is still work in progress...

What got done

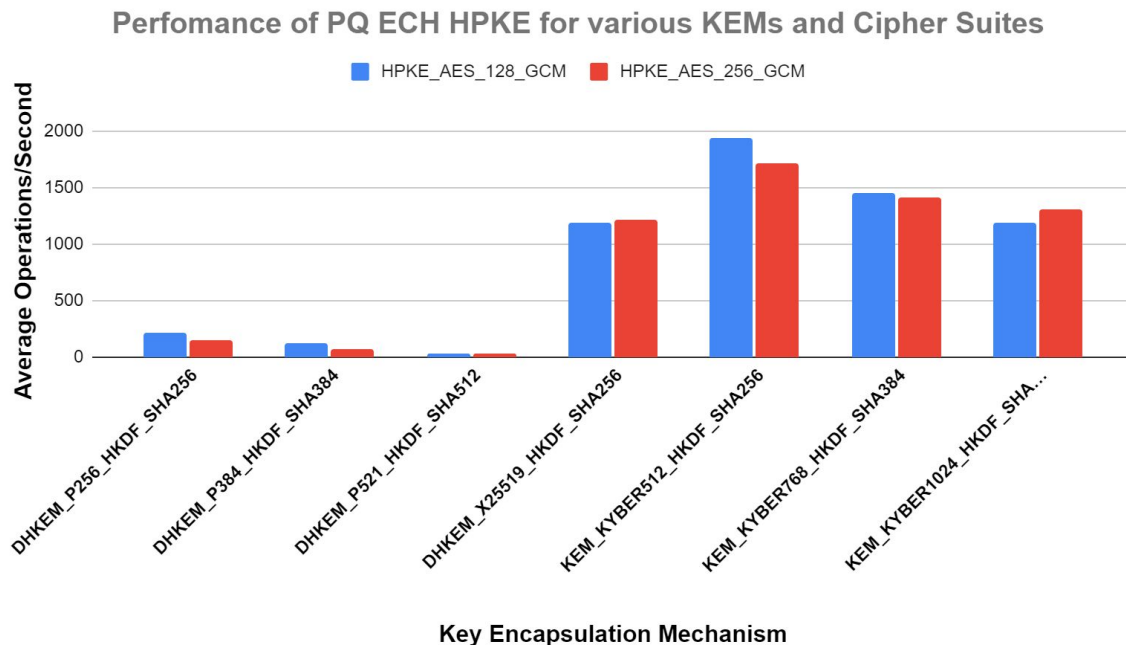
- Made HPKE run with Post-Quantum algorithms
 - Benchmarks created for PQ HPKE and PQ ECH
 - Measured the performance of PQ-HPKE

Issues resolved:

- PQC key sizes significantly bigger
- PQ KEMs (Kyber) has different operation compared to traditional ECDH based KEMs (key exchange)
- It is still a work in progress...
 - Full ECH PQ extension

What we learned

- Compared PQ algorithms for various KEMs and Cipher Suites
- PQ algorithms run **significantly** faster
 - At least for HPKE



Wrap Up



Team members:

Dr. Apostolos Fournaris
George Tasopoulos
Dr. Evangelos Haleplidis

*Industrial Systems Institute,
Research Center ATHENA, Greece*

First timers @ IETF/Hackathon:

Apostolos Fournaris

Contacts:

fournaris@athenarc.gr
g.tasop@isi.gr
haleplidis@isi.gr



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IETF Hackathon - PQ-ECH

