



# **IETF Hackathon**

## **Post-Quantum Encrypted Client Hello**

**IETF 118**

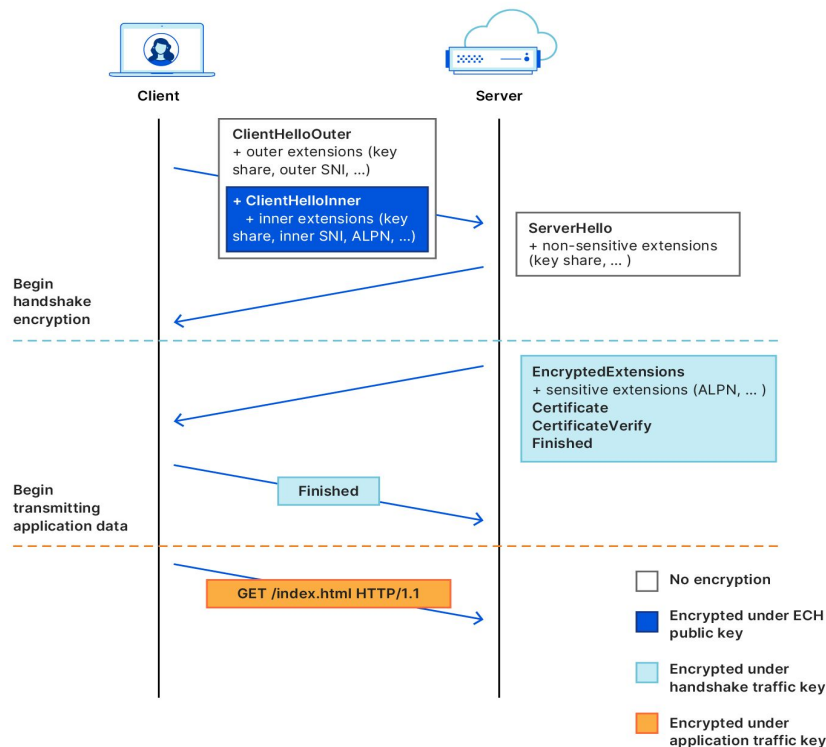
**4–5 November 2023**

**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

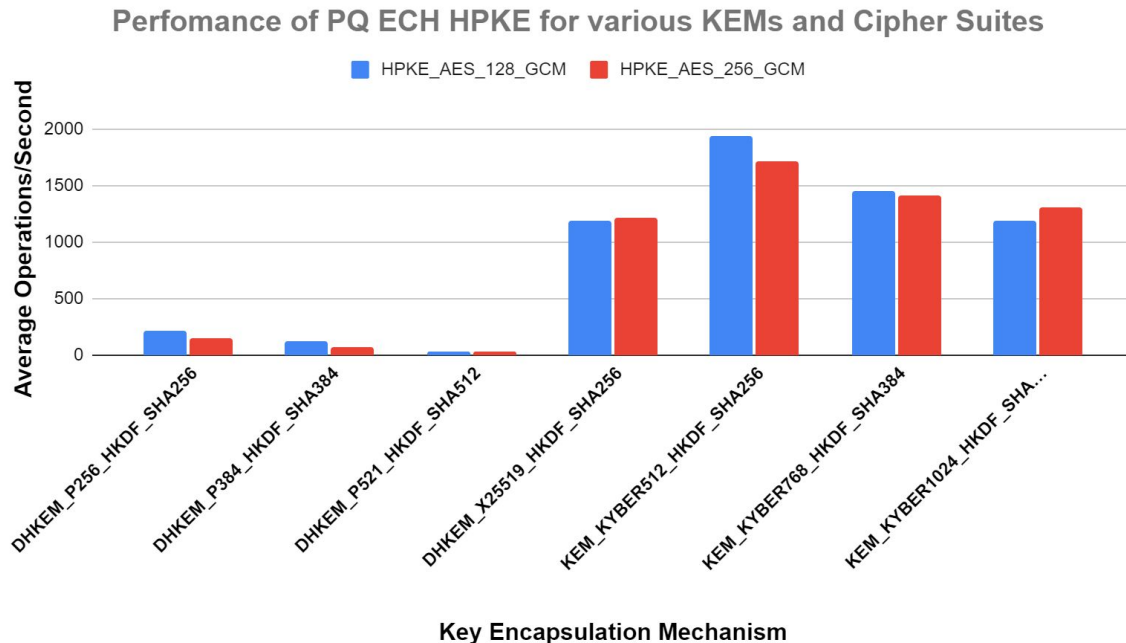
- Made HPKE run with Post-Quantum algorithms
  - Benchmarks created for PQ HPKE and PQ ECH
  - Measured the performance of PQ-HPKE

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



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IETF Hackathon - PQ-ECH

