

# COSE and JOSE Registrations for Post Quantum Signatures

**draft-ietf-cose-dilithium-01**  
**draft-ietf-cose-falcon-01**  
**draft-ietf-cose-sphincs-plus-01**



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# What's the deal with PQC?



- Why introduce new forms of cryptography?
  - [Shor's Algorithm](#)
- Why support existing standards / formats?
  - Easier path to developer adoption
  - Creates an upgrade path for standards compliant software
- What Algorithms and Why?
  - Signature and Key Representations are the building blocks for secure identifiers and credentials.
  - Stronger agility from supporting multiple primitives
    - Lattice schemes have the best security/size tradeoff
    - Hash schemes have well established security properties
- [NIST has announced candidates to be standardized](#)

# What are our goals?



- SPHINCS+, Falcon, Dilithium
- Intuitive upgrade path for post quantum
  - Enable leapfrogging from RSA to PQ
- Minimum cryptographic agility
  - Anticipate potential exploits in emerging tech
- Set a path for future PQ algorithms
- IANA Registrations
  - Mitigate ambiguity / parameterization related faults

# What is new with PQC?



- Keys and signatures are larger
  - trade off between signing and verification times
- Larger number of parameters for some algorithms
  - we need to keep optionality small based on expert feedback
- We need to be very clear about what parameters are in use with which signature schemes

# Draft Updates



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## UPDATED TEST VECTORS

LWE -> MLWE in Dilithium

Note to RFC Editor re NIST

Minor Editorial

Addition of acknowledgements and change log

Addition of OpenSSL based Test Vectors:

<https://github.com/mesur-io/post-quantum-signatures/tree/main/test-vectors/openssl>

# Help Wanted



- Test vectors, implementation tests, etc
- Parameter set finalization & feedback from NIST

# Next Steps



- Request for working group last call

# Resources



Work Item Repository (Issues, PRs, Details):

<https://github.com/mesur-io/post-quantum-signatures>

Datatracker(s):

<https://datatracker.ietf.org/doc/draft-prorock-cose-post-quantum-signatures/>

<https://datatracker.ietf.org/doc/draft-ietf-cose-dilithium/>

<https://datatracker.ietf.org/doc/draft-ietf-cose-falcon/>

<https://datatracker.ietf.org/doc/draft-ietf-cose-sphincs-plus/>

NIST PQC:

<https://csrc.nist.gov/projects/post-quantum-cryptography/news>

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Relevant Signature Schemes:

<https://pq-crystals.org/dilithium/> <https://falcon-sign.info/> <https://sphincs.org/>