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Post-Quantum Guidance for IETF protocols.
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Abstract

We provide guidance on the use of post-quantum algorithms for those deploying applications using IETF protocols.

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Table of Contents

1. Introduction	2
2. Terminology	2
3. Start using hybrid KEMs	3
4. Do nothing for now on signatures	3
5. Security Considerations	3
6. Acknowledgements	3
7. IANA Considerations	3
8. Normative References	3
Author's Address	3

1. Introduction

[[This is not an "official" work item anywhere, the -00 was proposed to TLS as such, but this version generalises to more than just TLS so is being proposed to the secdispatch list. The author does not expect that the current text will garner rough consensus, but wonders if we could get something useful that would without adding many words. The source for this is in <https://github.com/sftcd/pqg/> PRs are welcome there too.]]

Due to concerns about the possible future existence of a cryptographically relevant quantum computer (CRQC), additional IANA [RFC8446] codepoints have been defined for algorithms that are hoped to remain secure even in the face of a CRQC. Adding code-points for to the relevant IANA registries often doesn't require IETF consensus. This means that anyone can register code-points for their favoured approach. In particular various government entities in various countries have made contradictory recommendations in this space, leading to potential confusion for those deploying applications using TLS. For example, anyone can register a PQ algorithm in the TLS registries with the RECOMMENDED column set to 'n'

This document sets out a deliberately consise sets of recommendations for typical uses of post-quantum algorithms. This assumes the reader is familiar with the topic. Some implementations and environments may have to meet other requirements that conflict with this guidance.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Start using hybrid KEMs

The main recommendation is to move as soon as practical to use of hybrid KEMs, such as X25519MLKEM768.

Once it becomes practical to do the above, we do not recommend use of non-hybrid groups or "pure" PQ KEMs.

4. Do nothing for now on signatures

We recommend taking no action at all at this point in time in relation to deployment of PQ signatures.

5. Security Considerations

TBD

6. Acknowledgements

TBD

7. IANA Considerations

TBD, but probably not needed.

8. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", RFC 8446, DOI 10.17487/RFC8446, August 2018, <<https://www.rfc-editor.org/info/rfc8446>>.

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