# Signed Public Key and Challenge

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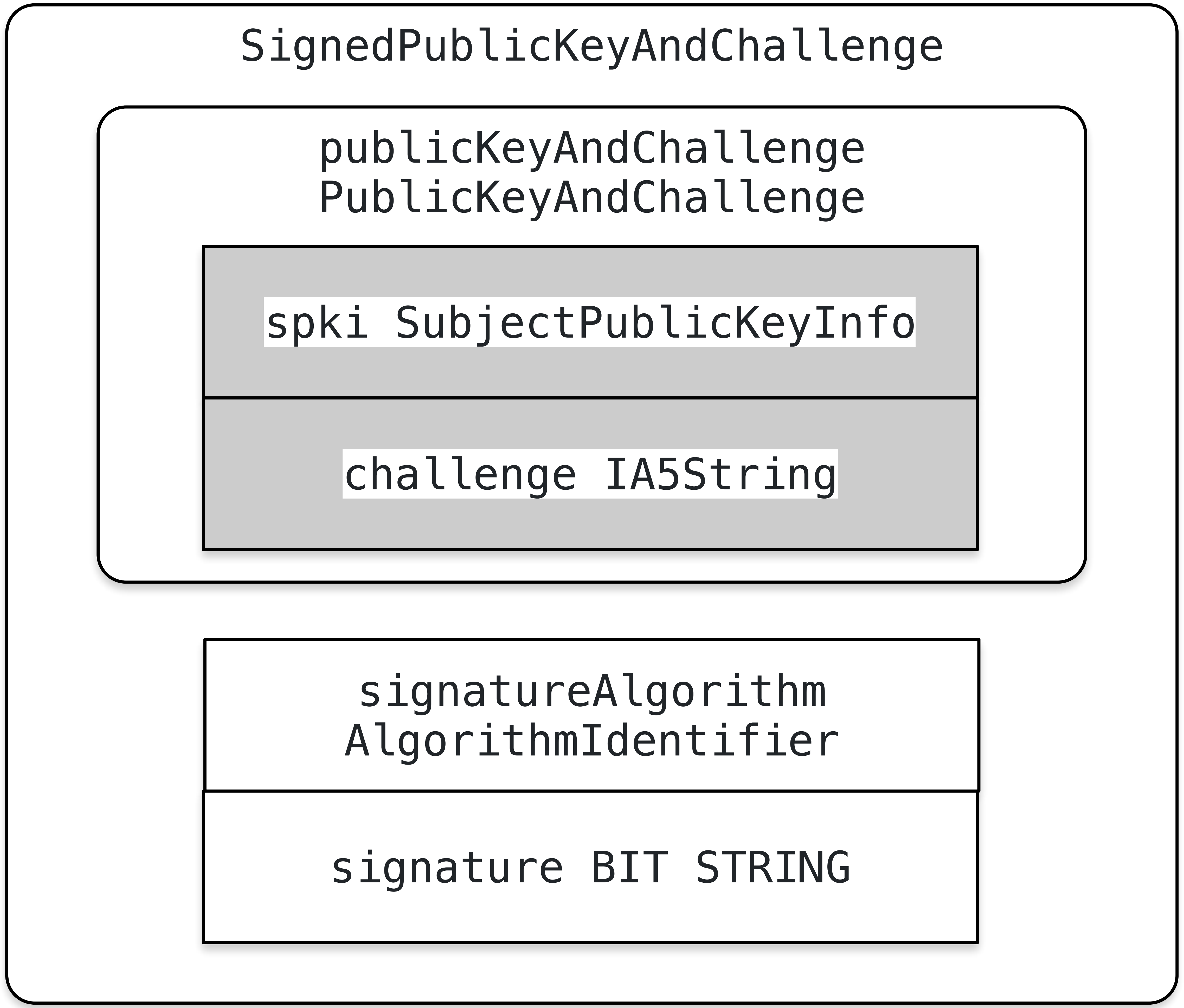
https://datatracker.ietf.org/doc/draft-leggett-spkac/01/

# What is SPKAC?

- An ASN1 structure
- Contains a public key, and a challenge
- All signed by the private key of that public key



SignedPublicKeyAndChallenge

publicKeyAndChallenge
PublicKeyAndChallenge

spki SubjectPublicKeyInfo

challenge IA5String

signatureAlgorithm
AlgorithmIdentifier

signature BIT STRING

# A long time ago, in a decade far far away

- In a land before time (mid nineteen nineties), a company called Netscape invented the keygen HTML tag.

- This keygen tag allowed a browser to prove possession of a locally generated private key, and invite a certificate authority to issue a certificate to match that private key.

- The private key was generated in the browser, and never left the end user's possession.

- Keygen eventually became part of the HTML5 specification.

# The Empire Strikes Back

- In the sequel to the keygen tag, a company that existed in the 1990s called Microsoft invented a different mechanism.
- Their mechanism was based on a Certificate Sign Request, but had the same overall property:
- The private key was generated in the browser, and never left the end user's possession.
- To this day, available in Microsoft Edge in “Internet Explorer Compatibility Mode”.

# Firefox, Google Said Yeah, Nah

- In a later episode in the saga, Firefox and Google said “yeah, nah” and removed keygen from the HTML5 specification.

- Part of the justification - and fairly so - is that the SPKAC message format that keygen tags used to prove possession was not defined or standardised.

- Another part of the justification - and again fairly so - was that the keygen tag (but not SPKAC) mandated the use of obsolete MD5.

- We propose an alternative approach, standardise the SPKAC message format at the IETF, and use the standard to fix any code implementation where MD5 was hard coded.

# Why bother?

- Code exists right now, today.
- That code is approaching three decades old, it is widely tested, and is widely interoperable.
- Throwing out good code is waste.
- People still want to prove they possess private keys.
- Not all private keys relate to certificates (DKIM, etc).

# Goals

- Formally define the SPKAC message format as a standard at the IETF.

- Update implementations of the standard, such as those at OpenSSL and Bouncycastle, to clearly show that they follow a standard.

- Update any implementations of the standard where the MD5 message digest is hard coded (OpenSSL fixed).

- Allow people to use the SPKAC message to prove they are in possession of a private key.

# Non Goals

- To conflate the SPKAC specification with the history of SPKAC and where it came from.

- Implementation details are important, however SPKAC is a message format, and we don’t want to get bogged down.

- To change SPKAC in any way, it works fine as it is.

“Where next?”