

Ask user for passphrase

Derive $K = \text{PBKDF}(\text{pass})$

Encrypted
challenge
exists in LUKS?

$\text{challenge} = \text{XOR}(K, \text{enc_chal})$

Challenge YubiKey,
Get response

Unlock LUKS with the response

Generate new challenge

Challenge Yubikey;
Get Response

$\text{enc_chal} = \text{XOR}(K, \text{chal})$

Store enc_chal in LUKS header

Add the response as a LUKS key

