Breaking Your Own Encryption

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- But I had backups!
- Encrypted...with the same password
- This is what I forgot: `f9tg#7f=<Ihe$lS-kK*l`

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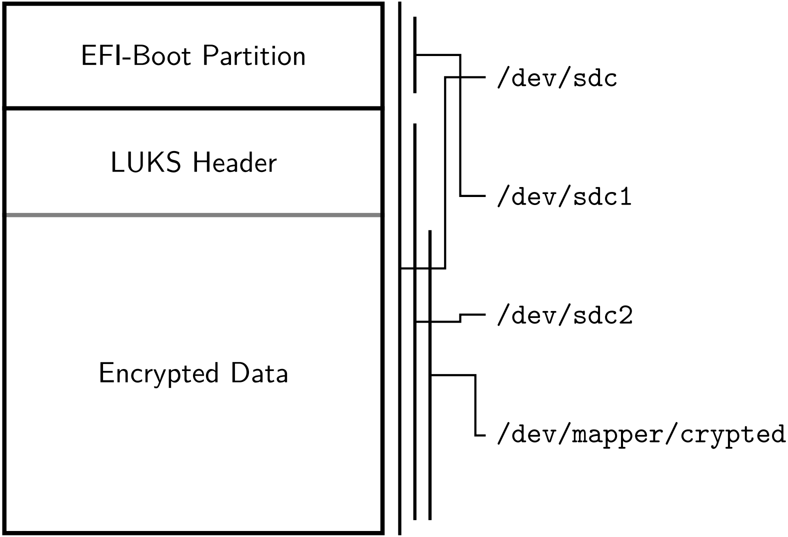
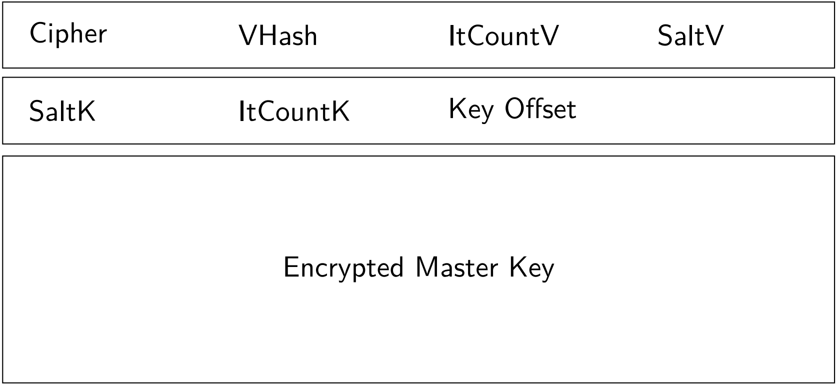
- Example: `mount /dev/sdc1 /home/felher`

My Encryption



The LUKS Header (kinda)



Cipher VHash ItCountV SaltV

SaltK ItCountK Key Offset

Encrypted Master Key

- Use SaltK + ItCountK + Password to derive KeyKey
- Use KeyKey to decrypt the master key
- Use ItCountV + SaltV + master Key to derive VHash
- Check if Equal

Let's Crack

1. generate possible passwords
2. let `hashcat` try them agains LUKS

Possible passwords

```
def gen(str: Str, Δ: Int): List[Str] =
  if (Δ == 0) List(str)
  else str match {
    case Nil        => List()
    case x::Nil     =>
      if (Δ == 1) chars.map(c => List(c)) else List()
    case x1::x2::xs => {
      val rt = gen(x2::xs, Δ - 1)
      rt ++
      gen(x2::xs, Δ).map(l => x1::l) ++
      gen(x1::xs, Δ - 1).map(l => x2 :: l) ++
      chars.flatMap(c => rt.map(l => c :: l)) ++
      chars.flatMap(c => rt.map(l => c :: x1 :: l))
    }
  }
```

Running HashCat

```
hashcat -m 14600 enc_luks_schenker/tmp/list \
        --gpu-temp-disable -w 3
```

And after 5 hours

```
f9tg#7f=<Ihe$lS-kK*l
```