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In other words:

128-bit AES key kAES_{AES_k(1)}(1), AE AES_{AES_k(2)}(1), AE AES_{AES_k(3)}(1), AE and so on.

This is really a new $(m, n) \mapsto AES_{AES}$ with a double-size

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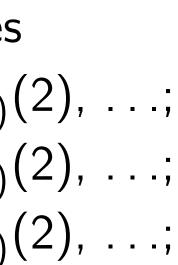
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Collect $AES_{AES_k(n)}(0)$ for 2^{40} inputs (n, 0).

- Build 2^{40} tiny search units, each computing 2^{48}
- iterates of $k' \mapsto AES_{k'}(0)$.
- Good chance of collision
- $k' = AES_k(n)$ for some n, k
- Find via distinguished points
- Then trivially compute
- $AES_{AES_k(n)}(1)$ etc.
- Current chip technology: < 1 year, < 10^{10} USD.

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 $S_{AES_{k}(1)}(2), ...;$ $S_{AES_{k}(2)}(2), ...;$ $S_{AES_{k}(3)}(2), ...;$

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- Small block, so distinguishable.
- Not much security margin.
- Uninspiring key schedule.
- Invites cache-timing attacks.
- Slow on most CPUs.
- Mediocre speed in hardware.
- Even slower with key expansion.

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How about Salsa2

- Large block; aim
- 150% security m
- Key at top, not
- Naturally consta
- Fast across CPL
- Better than AES
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Can generate 256first 256 bits of Sa using 64-bit nonce Use k' as Salsa20 Sr

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- 150% security margin.
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- Fast across CPUs.
- Better than AES in hardw • No key expansion.

- Can generate 256-bit k' as
- first 256 bits of Salsa20 stre
- using 64-bit nonce n, key k.
- Use k' as Salsa20 session ke

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Could generate 256-bit $k' = (AES_k(2n), AES_k(2n+1)).$ Use k' as key for 256-bit AES.

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- Naturally constant time.
- Fast across CPUs.
- Better than AES in hardware.
- No key expansion.

Can generate 256-bit k' as first 256 bits of Salsa20 stream using 64-bit nonce n, key k. Use k' as Salsa20 session key.

s on strategy #2.

- enerate 256-bit $\mathsf{ES}_k(2n)$, $\mathsf{AES}_k(2n+1)$). s key for 256-bit AES.
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- reat cipher:
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Salsa20 is actually producing 512-bit 256-bit key, 128-b

Conventionally 12 is interpreted as 6 and 64-bit block c (so output blocks but function is des to be fast and sec giving random acc So allow 128 bits Generate 256-bit A as half of 512-bit - 1)). S.

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Improvement #1:

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- producing 512-bit block from 256-bit key, 128-bit input.
- Conventionally 128-bit input
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- and 64-bit block counter
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Improve Look mo at how S initialize publicly adds 256 applies r adds 250 Take k' \Rightarrow Skip Importa block is

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So allow 128 bits in n. Generate 256-bit k'as half of 512-bit block. Improvement #2:

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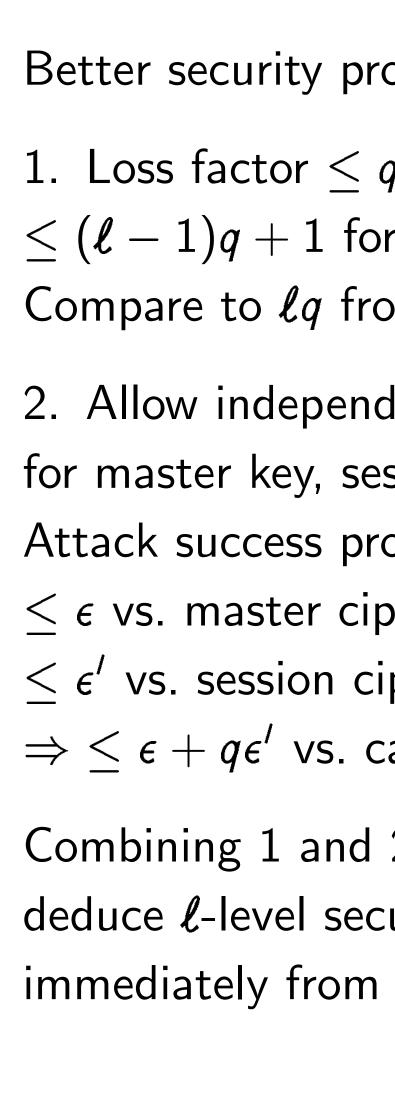
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