Stream Cipher

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Stream Cipher Principle: Basic Idea

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Procedure

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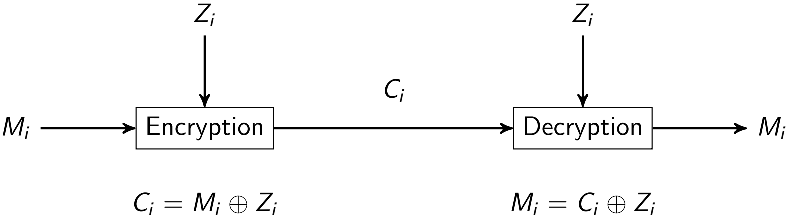

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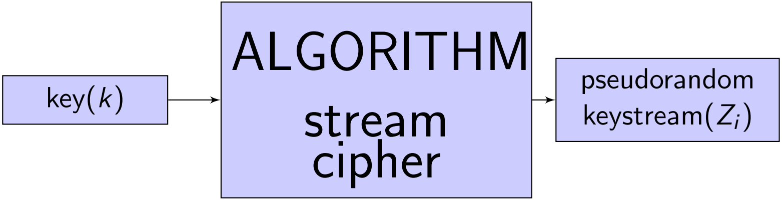
- A and B share a small binary string called *key*
- After that, the algorithm will take *key* as input and keep on generating *random-looking bitstream*, the keystream bits. This algorithm is the Stream cipher.



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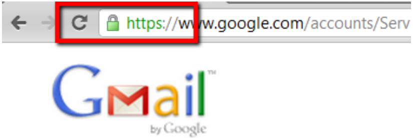
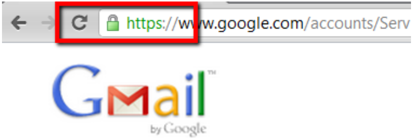
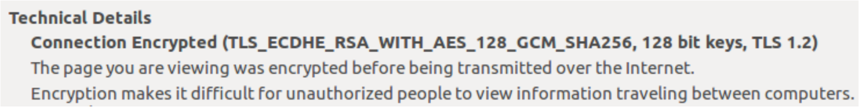


https://www.google.com/accounts/Serv





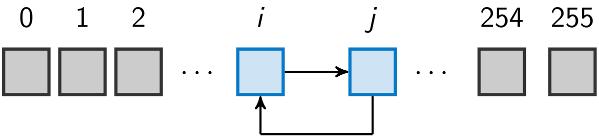
Technical Details

Connection Encrypted (TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256, 128 bit keys, TLS 1.2)

The page you are viewing was encrypted before being transmitted over the Internet.

Encryption makes it difficult for unauthorized people to view information traveling between computers.

Key Scheduling Algorithm (KSA)

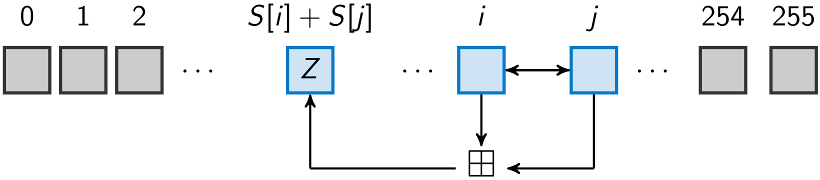


```
Initialize index: $j = 0$;
for $i = 0, \ldots, 255$ do
    $j = j + S[i] + K[i]$;
    Swap $S[i] \leftrightarrow S[j]$;
end
```

INPUT: *S*-array initialized to identity permutation, and key K

OUTPUT: Scrambled *S*-array

Pseudo-Random Generation Algorithm (PRGA)



```
Initialize indices: $i = j = 0$;
while $TRUE$ do
    $i = i + 1$;
    $j = j + S[i]$;
    Swap $S[i] \leftrightarrow S[j]$;
    Output $Z = S[S[i] + S[j]]$;
end
```

INPUT: Scrambled S-array, obtained as the KSA output

OUTPUT: Pseudo-random stream

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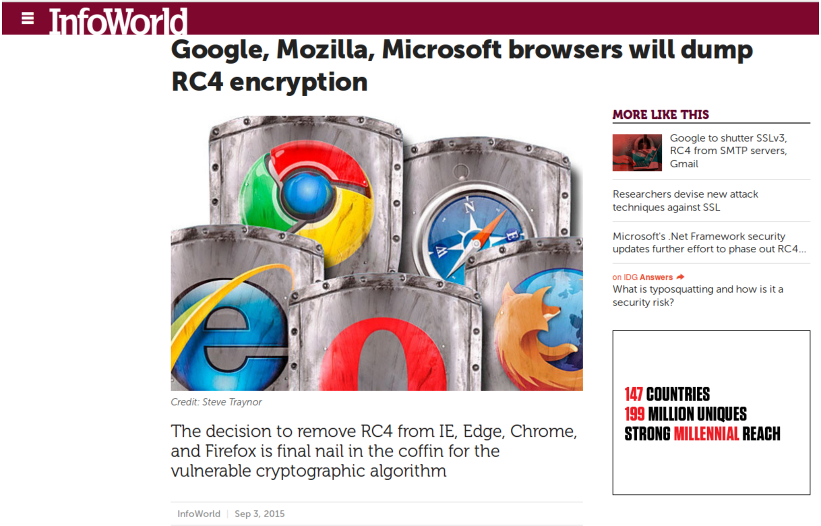
- $\Pr(Z_r = r - K[0]) < \frac{1}{256}$: Paterson et al in 2014.



≡ InfoWorld

Google, Mozilla, Microsoft browsers will dump RC4 encryption

Credit: Steve Traynor

The decision to remove RC4 from IE, Edge, Chrome, and Firefox is final nail in the coffin for the vulnerable cryptographic algorithm

InfoWorld | Sep 3, 2015

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