

1. Symmetric Encryption, Block Ciphers and Stream Ciphers

Learn the fundamentals of symmetric encryption, as well as the differences between block ciphers and stream ciphers, and their respective modes of operation. This lesson will not go too much in depth to keep these lessons simple, so I highly recommend you to explore each concept in your own time.

1 Learn

1.1 Symmetric Encryption

Encrypting and decrypting information **using the same key** for both of these operations is what we call symmetric cryptography.

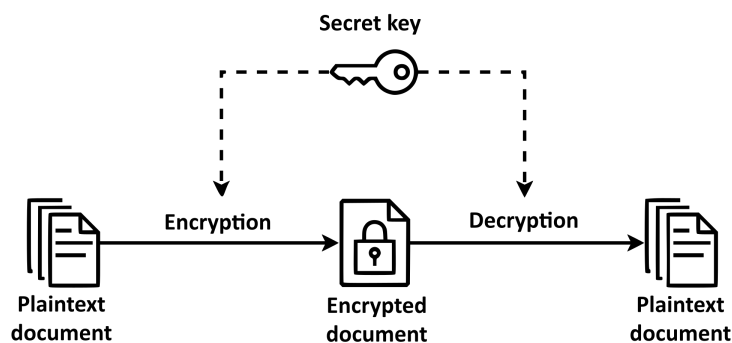


Figure 1: Symmetric encryption process

A plethora of different algorithms have been developed over the years. Most commonly used to this day are AES [↗](#) (also known as Rijndael), ChaCha20 [↗](#), ARIA [↗](#), Camellia [↗](#), and a couple of others. You may have also heard about ciphers like RC4 [↗](#), DES [↗](#) and 3DES [↗](#), however they are considered to be insecure and therefore were deprecated.

1.2 Where is it used?

Whenever we talk about encryption protocols, you can safely assume symmetric encryption is used. For example, TLS secures web access by combining symmetric and asymmetric ciphers, key exchange, authentication, and hashing (in what we call a ciphersuite). Symmetric ciphers are also the standard for encrypting large data volumes. VeraCrypt, a disk encryption utility, uses AES, Camellia, Kuznyechik, where as BitLocker uses AES. SSH used RC4, DES, and 3DES in the past, but now primarily relies on AES and ChaCha20.

1.3 Symmetric vs. Asymmetric

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1.4 Block ciphers

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2 Practice

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