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Principle behind DH

DH key exchange assumes first that there exists:

1. A public key cipher system that has a special property (we come to this shortly).

2. A carefully chosen, publicly known function F that takes two numbers x and y as input, and outputs a third number $F(x,y)$ (for example, multiplication is such a function).

DH key exchange was first proposed before there were any known public key algorithms, but the idea behind it motivated the hunt for practical public key algorithms.

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2. Alice computes $F(SA, PB)$
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4. The special property of the public key cipher system, and the choice of the function F , are such that $F(SA, PB) = F(SB, PA)$. If this is the case then Alice and Bob now share a secret.
5. This shared secret can easily be converted by some public means into a bitstring suitable for use as, for example, a DES key.

Assume that Alice and Bob are the parties who wish to establish a shared secret, and let their public and private keys in the public key cipher system be denoted by (PA, SA) and (PB, SB) respectively.

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