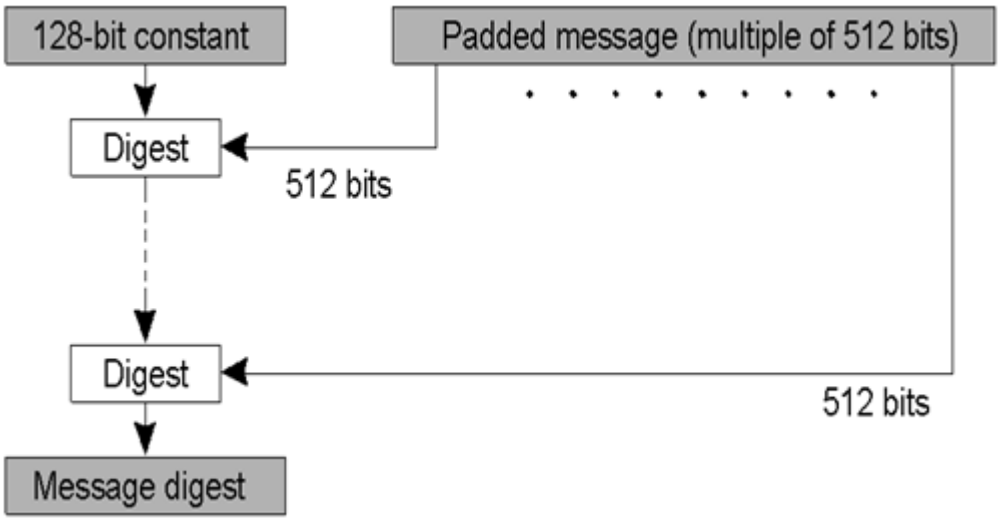
MD5 algorithm was developed by Professor Ronald L. Rivest in 1991. According to RFC 1321, “MD5 message-digest algorithm takes as input a message of arbitrary length and produces as output a 128-bit “fingerprint” or “message digest” of the input.

The MD5 algorithm is intended for digital signature applications, where a large file must be “compressed” in a secure manner before being encrypted with a private (secret) key under a public-key cryptosystem such as RSA.”



MD5 algorithm structure

General steps:

1. Input message must be < 264 bits
2. Not really a problem.
3. Message is processed in 512-bit blocks sequentially
4. Message digest is 160 bits

MD5 Algorithms steps:

Step1: Padding

Step2: Appending length as 64 bit unsigned

Step3: Initialize MD buffer 5 32-bit words

Store in big endian format, most significant bit in low address

A|B|C|D|E

A = 67452301

B = efcdab89

C = 98badcfe

D = 10325476

E = c3d2e1f0

Step 4: the 80-step processing of 512-bit blocks – 4 rounds, 20 steps each.

Each step t (0 <= t <= 79):

Input:

Wt. – a 32-bit word from the message

Kt – a constant.

ABCDE: current MD.

Output:

ABCDE: new MD.

Only 4 per-round distinctive additive constants

0 <=t<= 19 Kt = 5A827999

20<=t<=39 Kt = 6ED9EBA1

40<=t<=59 Kt = 8F1BBCDC

60<=t<=79 Kt = CA62C1D6

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