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Keyed-Hash Message Authentication Code (HMAC)

Hashlen = 160

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Key length = 64

Tag length = 20

Input Data:

"Sample message for keylen=blocklen"

Text is

5361 6D706C65 206D6573  
73616765 20666F72 206B6579 6C656E3D 626C6F63 6B6C656E

Key is

00010203 04050607 08090A0B 0C0D0E0F  
10111213 14151617 18191A1B 1C1D1E1F 20212223 24252627  
28292A2B 2C2D2E2F 30313233 34353637 38393A3B 3C3D3E3F

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K0 is

00010203 04050607 08090A0B 0C0D0E0F  
10111213 14151617 18191A1B 1C1D1E1F 20212223 24252627  
28292A2B 2C2D2E2F 30313233 34353637 38393A3B 3C3D3E3F

K0^ipad is

36373435 32333031 3E3F3C3D 3A3B3839  
26272425 22232021 2E2F2C2D 2A2B2829 16171415 12131011  
1E1F1C1D 1A1B1819 06070405 02030001 0E0F0C0D 0A0B0809

Hash((Key^ipad)||text) is

8F51A3BB 9E96B972 59A90921 321F538A DF4A343D

K0 xor opad is

5C5D5E5F 58595A5B 54555657 50515253  
4C4D4E4F 48494A4B 44454647 40414243 7C7D7E7F 78797A7B

74757677 70717273 6C6D6E6F 68696A6B 64656667 60616263

Hash((K0^opad)||Hash((K0^ipad)||text)) is

5FD596EE 78D5553C 8FF4E72D 266DFD19 2366DA29

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mac is

5FD596EE 78D5553C 8FF4E72D 266DFD19 2366DA29

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Key length = 20

Tag length = 20

Input Data:

"Sample message for keylen<blocklen"

Text is

5361 6D706C65 206D6573  
73616765 20666F72 206B6579 6C656E3C 626C6F63 6B6C656E

Key is

00010203 04050607 08090A0B 0C0D0E0F 10111213

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K0 is

00010203 04050607 08090A0B 0C0D0E0F  
10111213 00000000 00000000 00000000 00000000 00000000  
00000000 00000000 00000000 00000000 00000000 00000000

K0^ipad is

36373435 32333031 3E3F3C3D 3A3B3839  
26272425 36363636 36363636 36363636 36363636 36363636  
36363636 36363636 36363636 36363636 36363636 36363636

Hash((Key^ipad)||text) is

13DE01B7 AD467D75 6FBA1EA8 16866E32 416A269D

K0 xor opad is

5C5D5E5F 58595A5B 54555657 50515253  
4C4D4E4F 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C  
5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C

Hash((K0^opad)||Hash((K0^ipad)||text)) is

4C99FF0C B1B31BD3 3F8431DB AF4D17FC D356A807

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mac is

4C99FF0C B1B31BD3 3F8431DB AF4D17FC D356A807

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Key length = 100

Tag length = 20

Input Date:

"Sample message for keylen=blocklen"

Text is

5361 6D706C65 206D6573  
73616765 20666F72 206B6579 6C656E3D 626C6F63 6B6C656E

Key is

00010203  
04050607 08090A0B 0C0D0E0F 10111213 14151617 18191A1B  
1C1D1E1F 20212223 24252627 28292A2B 2C2D2E2F 30313233  
34353637 38393A3B 3C3D3E3F 40414243 44454647 48494A4B  
4C4D4E4F 50515253 54555657 58595A5B 5C5D5E5F 60616263

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K0 is

1E6634BF AEBC0348 29810592 3D0F26E4  
7AA33FF5 00000000 00000000 00000000 00000000 00000000  
00000000 00000000 00000000 00000000 00000000 00000000

K0^ipad is

28500289 988A357E 1FB733A4 0B3910D2  
4C9509C3 36363636 36363636 36363636 36363636 36363636

36363636 36363636 36363636 36363636 36363636 36363636

Hash((Key^ipad)||text) is

6487C866 A66F67A2 218B8E89 8892F9E8 282023D2

K0 xor opad is

423A68E3 F2E05F14 75DD59CE 61537AB8  
26FF63A9 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C  
5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C

Hash((K0^opad)||Hash((K0^ipad)||text)) is

2D51B2F7 750E4105 84662E38 F133435F 4C4FD42A

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mac is

2D51B2F7 750E4105 84662E38 F133435F 4C4FD42A

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Key length = 49

Tag length = 12

Input Date:

"Sample message for keylen<blocklen, with truncated tag"

Text is

5361 6D706C65  
206D6573 73616765 20666F72 206B6579 6C656E3C 626C6F63  
6B6C656E 2C207769 74682074 72756E63 61746564 20746167

Key is

00  
01020304 05060708 090A0B0C 0D0E0F10 11121314 15161718  
191A1B1C 1D1E1F20 21222324 25262728 292A2B2C 2D2E2F30

-----  
K0 is

00010203 04050607 08090A0B 0C0D0E0F  
10111213 14151617 18191A1B 1C1D1E1F 20212223 24252627

28292A2B 2C2D2E2F 30000000 00000000 00000000 00000000

$K \oplus \text{ipad}$  is

36373435 32333031 3E3F3C3D 3A3B3839  
26272425 22232021 2E2F2C2D 2A2B2829 16171415 12131011  
1E1F1C1D 1A1B1819 06363636 36363636 36363636 36363636

$\text{Hash}((K \oplus \text{ipad}) \parallel \text{text})$  is

65B451E5 30BF4E5D D6EF3891 861D5C82 CEEF5843

$K \oplus \text{xor opad}$  is

5C5D5E5F 58595A5B 54555657 50515253  
4C4D4E4F 48494A4B 44454647 40414243 7C7D7E7F 78797A7B  
74757677 70717273 6C5C5C5C 5C5C5C5C 5C5C5C5C 5C5C5C5C

$\text{Hash}((K \oplus \text{opad}) \parallel \text{Hash}((K \oplus \text{ipad}) \parallel \text{text}))$  is

FE352956 5CD8E28C 5FA79EAC 9D8023B5 3B289D96

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mac is

FE352956 5CD8E28C 5FA79EAC