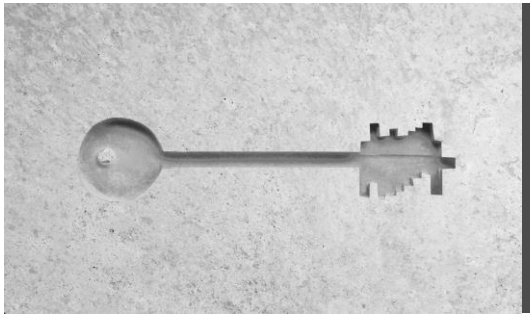


SecurityServer 4.21
Algorithms and Key Sizes

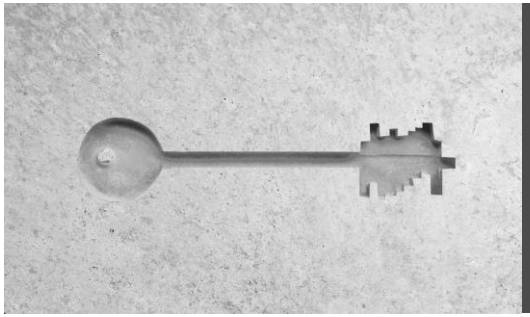
1 SecurityServer 4.21 Supported Algorithms and Key Sizes

SecurityServer 4.21 supports numerous algorithms for encryption / decryption, message authentication, message digest calculation / hashing, digital signature generation and verification, and key agreement. The following tables list all supported algorithms with their respective key sizes and other relevant parameters, and names the standards to which they comply.

Algorithms resp. Modes of Operation marked with * have been newly introduced in SecurityServer 4.21.

Encryption / Decryption

Algorithm	Key size(s) (bit)	Standard
AES ECB / CBC / CFB8 / OFB	128 / 192 / 256	FIPS 197; SP 800-38A
AES CCM	128 / 192 / 256	FIPS 197, SP800-38C
AES GCM	128 / 192 / 256	FIPS 197, SP800-38D
Triple DES ECB / CBC / CFB8	128 / 192	SP 800-67, SP 800-38A
DES ECB / CBC / CFB8	64	FIPS 46-3, SP 800-38A
RSA	512 – 16384	PKCS#1 V1.5, PKCS#1 V2.1 EME-OAEP
ECC (ECIES)	112 – 571	SEC 1: Elliptic Curve Cryptography for a list of built-in Elliptic Curves see CS_PD_SecurityServer_Elliptic_Curves.pdf



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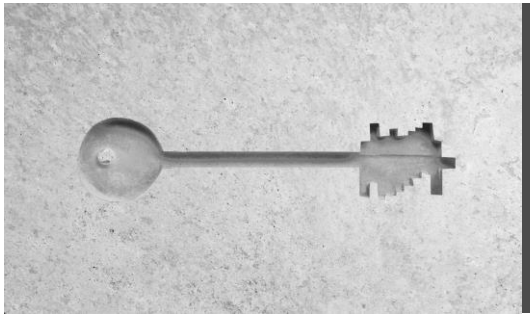
Message Authentication

Algorithm	Key size(s) (bit)	Standard
AES CMAC	128 / 192 / 256	FIPS 197, NIST SP 800-38B
AES GMAC	128 / 192 / 256	FIPS 197, NIST SP 800-38D
AES MAC CBC Mode	128 / 192 / 256	FIPS 197, ISO/IEC 9797
Triple-DES MAC	128 / 192	NIST SP 800-67, ANSI X9.9
Triple-DES Retail-MAC	128 / 192	NIST SP 800-67, ANSI X9.19
HMAC	160 / 224 / 256 / 384 / 512	FIPS 198-1, based on SHA-1 / SHA2 / SHA3

Message Digest

Algorithm	Hash size(s) (bit)	Standard
SHA-1	160	FIPS 180-4
SHA2	224 / 256 / 384 / 512	FIPS 180-4
SHA3	224 / 256 / 384 / 512	FIPS 202
MD5	128	RFC 1321
MDC-2	128	
RIPEMD-160	160	https://homes.esat.kuleuven.be/~bosselae/ripemd160.html



SecurityServer 4.21
Algorithms and Key Sizes

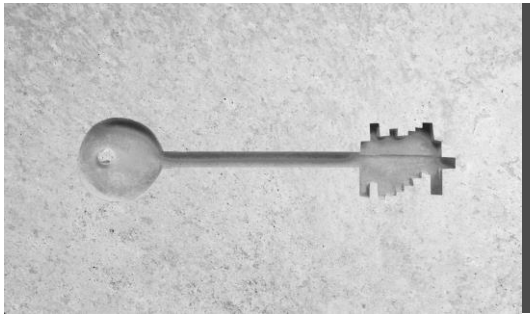
Digital Signature Generation and Verification

Algorithm	Key size(s) (bit)	Standard
RSA	512 – 16384	FIPS 186-4
DSA	1024 – 3072	FIPS 186-4
ECDSA	112 – 571	FIPS 186-4 for a list of built-in Elliptic Curves see CS_PD_SecurityServer_Elliptic_Curves.pdf
EdDSA (Ed25519)	255	RFC 8032 PureEdDSA w/ curve “edwards25519”

Notice: The size of RSA keys stored on smartcards and used for smartcard-based user authentication is limited to 2048 bit.

Key Agreement

Algorithm	Key size(s) (bit)	Standard
DH	1024 – 3072	NIST SP 800-56A, ANSI X9.42
ECDH	112 – 571	NIST SP 800-56A, ANSI X9.42 for a list of built-in Elliptic Curves see CS_PD_SecurityServer_Elliptic_Curves.pdf
ECDH (X25519)	255	RFC 7748 w/ curve “curve25519”



SecurityServer 4.21
Algorithms and Key Sizes

Key Wrapping

Algorithm	Key size(s) (bit)	Standard
AES Key Wrap	128 / 192 / 256	NIST SP 800-38F (KW)
AES Key Wrap w/ padding	128 / 192 / 256	NIST SP 800-38F (KWP)
AES Key Wrap w/ PKCS#7 padding	128 / 192 / 256	PKCS#11 (mechanism CKM_AES_KEY_WRAP_PAD), RFC5649