

1 PKCS#11 Mechanisms

The following tables are based on PKCS#11 specification version 2.20 and its amendment 3, version 2.40 and draft version 3.00.

All mechanism-function-combinations defined by the standard and supported by SecurityServer 4.10 are marked with a ✓ character. All mechanism-function-combinations defined by the standard but not supported by SecurityServer 4.10 are marked with – characters. Empty mechanism-function-combinations are not defined by the standard.

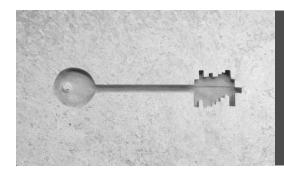
All Vendor Defined Mechanisms provided by SecurityServer 4.10 are listed on the last page of this section.

Supported mechanisms are supported equally on all CryptoServer hardware platforms.

PKCS#11 v2.20

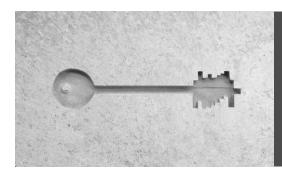
Mechanism	Function									
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive			
CKM_RSA_PKCS_KEY_PAIR_GEN					✓					
CKM_RSA_X9_31_KEY_PAIR_GEN					✓					
CKM_RSA_PKCS	√2	√2	✓			✓				
CKM_RSA_PKCS_OAEP	√2					✓				
CKM_RSA_PKCS_PSS		√2								
CKM_RSA_9796										
CKM_RSA_X_509	√2	√2	✓			✓				
CKM_RSA_X9_31		√2								





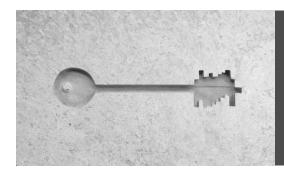
Mechanism	Function										
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive				
CKM_MD2_RSA_PKCS											
CKM_MD5_RSA_PKCS		✓									
CKM_SHA1_RSA_PKCS		✓									
CKM_SHA256_RSA_PKCS		✓									
CKM_SHA384_RSA_PKCS		✓									
CKM_SHA512_RSA_PKCS		✓									
CKM_RIPEMD128_RSA_PKCS											
CKM_RIPEMD160_RSA_PKCS		✓									
CKM_SHA1_RSA_PKCS_PSS		✓									
CKM_SHA256_RSA_PKCS_PSS		✓									
CKM_SHA384_RSA_PKCS_PSS		✓									
CKM_SHA512_RSA_PKCS_PSS		✓									
CKM_SHA1_RSA_X9_31		✓									
CKM_DSA_KEY_PAIR_GEN					✓						
CKM_DSA_PARAMETER_GEN					✓						
CKM_DSA		√2									
CKM_DSA_SHA1		✓									
CKM_FORTEZZA_TIMESTAMP											





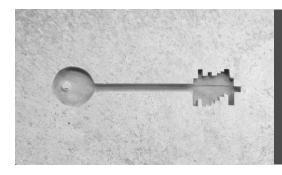
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_EC_KEY_PAIR_GEN (CKM_ECDSA_KEY_PAIR_GEN)				_	/		
CKM_ECDSA		√2					
CKM_ECDSA_SHA1		✓					
CKM_ECDH1_DERIVE							✓
CKM_ECDH1_COFACTOR_DERIVE							✓
CKM_ECMQV_DERIVE							
CKM_DH_PKCS_KEY_PAIR_GEN					✓		
CKM_DH_PKCS_PARAMETER_GEN							
CKM_DH_PKCS_DERIVE							✓
CKM_X9_42_DH_KEY_PAIR_GEN					✓		
CKM_X9_42_DH_PKCS_PARAMETER_GEN					✓		
CKM_X9_42_DH_DERIVE							✓
CKM_X9_42_DH_HYBRID_DERIVE							
CKM_X9_42_MQV_DERIVE							
CKM_KEA_KEY_PAIR_GEN							
CKM_KEA_KEY_DERIVE							
CKM_GENERIC_SECRET_KEY_GEN					✓		
CKM_RC2_KEY_GEN							





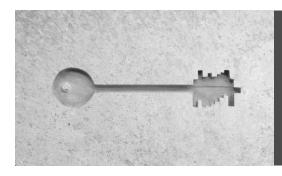
Mechanism	Function Encrypt &	Sign &			Gen. Key	Wrap &	
	Decrypt	Verify	SR & VR ¹	Digest	(Pair)	Unwrap	Derive
CKM_RC2_ECB							
CKM_RC2_CBC							
CKM_RC2_CBC_PAD							
CKM_RC2_MAC_GENERAL							
CKM_RC2_MAC							
CKM_RC4_KEY_GEN							
CKM_RC4							
CKM_RC5_KEY_GEN							
CKM_RC5_ECB							
CKM_RC5_CBC							
CKM_RC5_CBC_PAD							
CKM_RC5_MAC_GENERAL							
CKM_RC5_MAC							
CKM_AES_KEY_GEN					✓		
CKM_AES_ECB	✓					✓	
CKM_AES_CBC	✓					✓	
CKM_AES_CBC_PAD	✓					✓	
CKM_AES_MAC_GENERAL		✓					





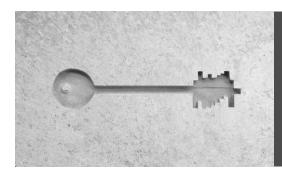
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_AES_MAC		✓					
CKM_DES_KEY_GEN					✓		
CKM_DES_ECB	✓					✓	
CKM_DES_CBC	✓					✓	
CKM_DES_CBC_PAD	✓					✓	
CKM_DES_MAC_GENERAL		✓					
CKM_DES_MAC		✓					
CKM_DES2_KEY_GEN					✓		
CKM_DES3_KEY_GEN					✓		
CKM_DES3_ECB	✓					✓	
CKM_DES3_CBC	✓					✓	
CKM_DES3_CBC_PAD	✓					✓	
CKM_DES3_MAC_GENERAL		✓					
CKM_DES3_MAC		✓					
CKM_CAST_KEY_GEN							
CKM_CAST_ECB							
CKM_CAST_CBC							
CKM_CAST_CBC_PAD							





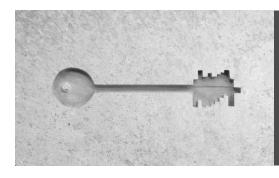
Mechanism	Function					Wrap & Unwrap	
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)		Derive
CKM_CAST_MAC_GENERAL							
CKM_CAST_MAC							
CKM_CAST3_KEY_GEN							
CKM_CAST3_ECB							
CKM_CAST3_CBC							
CKM_CAST3_CBC_PAD							
CKM_CAST3_MAC_GENERAL							
CKM_CAST3_MAC							
CKM_CAST128_KEY_GEN (CKM_CAST5_KEY_GEN)							
CKM_CAST128_ECB (CKM_CAST5_ECB)							
CKM_CAST128_CBC (CKM_CAST5_CBC)							
CKM_CAST128_CBC_PAD (CKM_CAST5_CBC_PAD)							
CKM_CAST128_MAC_GENERAL (CKM_CAST5_MAC_GENERAL)							
CKM_CAST128_MAC (CKM_CAST5_MAC)							
CKM_IDEA_KEY_GEN							
CKM_IDEA_ECB							
CKM_IDEA_CBC							
CKM_IDEA_CBC_PAD							





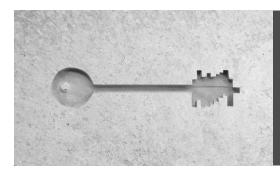
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_IDEA_MAC_GENERAL							
CKM_IDEA_MAC							
CKM_CDMF_KEY_GEN							
CKM_CDMF_ECB							
CKM_CDMF_CBC							
CKM_CDMF_CBC_PAD							
CKM_CDMF_MAC_GENERAL							
CKM_CDMF_MAC							
CKM_DES_ECB_ENCRYPT_DATA							✓
CKM_DES_CBC_ENCRYPT_DATA							✓
CKM_DES3_ECB_ENCRYPT_DATA							✓
CKM_DES3_CBC_ENCRYPT_DATA							✓
CKM_AES_ECB_ENCRYPT_DATA							✓
CKM_AES_CBC_ENCRYPT_DATA							✓
CKM_SKIPJACK_KEY_GEN							
CKM_SKIPJACK_ECB64							
CKM_SKIPJACK_CBC64							
CKM_SKIPJACK_OFB64							





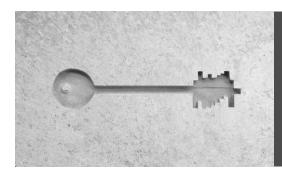
Mechanism	Function										
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive				
CKM_SKIPJACK_CFB64											
CKM_SKIPJACK_CFB32											
CKM_SKIPJACK_CFB16											
CKM_SKIPJACK_CFB8											
CKM_SKIPJACK_WRAP											
CKM_SKIPJACK_PRIVATE_WRAP											
CKM_SKIPJACK_RELAYX											
CKM_BATON_KEY_GEN											
CKM_BATON_ECB128											
CKM_BATON_ECB96											
CKM_BATON_CBC128											
CKM_BATON_COUNTER											
CKM_BATON_SHUFFLE											
CKM_BATON_WRAP											
CKM_JUNIPER_KEY_GEN											
CKM_JUNIPER_ECB128											
CKM_JUNIPER_CBC128											
CKM_JUNIPER_COUNTER											





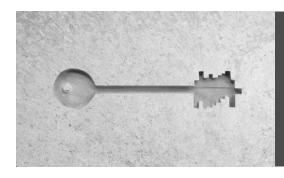
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_JUNIPER_SHUFFLE							
CKM_JUNIPER_WRAP							
CKM_MD2							
CKM_MD2_HMAC_GENERAL							
CKM_MD2_HMAC							
CKM_MD2_KEY_DERIVATION							
CKM_MD5				✓			
CKM_MD5_HMAC_GENERAL		✓					
CKM_MD5_HMAC		✓					
CKM_MD5_KEY_DERIVATION							✓
CKM_SHA_1				✓			
CKM_SHA_1_HMAC_GENERAL		✓					
CKM_SHA_1_HMAC		✓					
CKM_SHA1_KEY_DERIVATION							✓
CKM_SHA256				✓			
CKM_SHA256_HMAC_GENERAL		✓					
CKM_SHA256_HMAC		✓					
CKM_SHA256_KEY_DERIVATION							✓





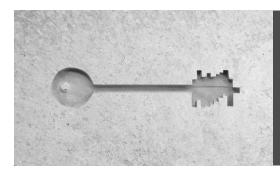
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_SHA384				√			
CKM_SHA384_HMAC_GENERAL		✓					
CKM_SHA384_HMAC		✓					
CKM_SHA384_KEY_DERIVATION							✓
CKM_SHA512				✓			
CKM_SHA512_HMAC_GENERAL		✓					
CKM_SHA512_HMAC		✓					
CKM_SHA512_KEY_DERIVATION							✓
CKM_RIPEMD128							
CKM_RIPEMD128_HMAC_GENERAL							
CKM_RIPEMD128_HMAC							
CKM_RIPEMD160				✓			
CKM_RIPEMD160_HMAC_GENERAL		✓					
CKM_RIPEMD160_HMAC		✓					
CKM_FASTHASH							
CKM_PBE_MD2_DES_CBC							
CKM_PBE_MD5_DES_CBC							
CKM_PBE_MD5_CAST_CBC							





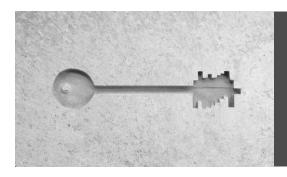
Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_PBE_MD5_CAST3_CBC							
CKM_PBE_MD5_CAST128_CBC (CKM_PBE_MD5_CAST5_CBC)							
CKM_PBE_SHA1_CAST128_CBC (CKM_PBE_SHA1_CAST5_CBC)							
CKM_PBE_SHA1_RC4_128							
CKM_PBE_SHA1_RC4_40							
CKM_PBE_SHA1_DES3_EDE_CBC							
CKM_PBE_SHA1_DES2_EDE_CBC							
CKM_PBE_SHA1_RC2_128_CBC							
CKM_PBE_SHA1_RC2_40_CBC							
CKM_PBA_SHA1_WITH_SHA1_HMAC							
CKM_PKCS5_PBKD2							
CKM_KEY_WRAP_SET_OAEP							
CKM_KEY_WRAP_LYNKS							
CKM_SSL3_PRE_MASTER_KEY_GEN							
CKM_SSL3_MASTER_KEY_DERIVE							
CKM_SSL3_MASTER_KEY_DERIVE_DH							
CKM_SSL3_KEY_AND_MAC_DERIVE							
CKM_SSL3_MD5_MAC							





Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_SSL3_SHA1_MAC							
CKM_TLS_PRE_MASTER_KEY_GEN							
CKM_TLS_MASTER_KEY_DERIVE							
CKM_TLS_MASTER_KEY_DERIVE_DH							
CKM_TLS_KEY_AND_MAC_DERIVE							
CKM_TLS_PRF							
CKM_WTLS_PRE_MASTER_KEY_GEN							
CKM_WTLS_MASTER_KEY_DERIVE							
CKM_WTLS_MASTER_KEY_DERIVE_DH_ECC							
CKM_WTLS_SERVER_KEY_AND_MAC_DERIVE							
CKM_WTLS_CLIENT_KEY_AND_MAC_DERIVE							
CKM_WTLS_PRF							
CKM_CMS_SIG							
CKM_CONCATENATE_BASE_AND_KEY							✓
CKM_CONCATENATE_BASE_AND_DATA							✓
CKM_CONCATENATE_DATA_AND_BASE							✓
CKM_XOR_BASE_AND_DATA							✓
CKM_EXTRACT_KEY_FROM_KEY							✓





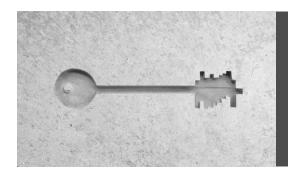
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Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_SHA224				✓			
CKM_SHA224_HMAC		✓					
CKM_SHA224_HMAC_GENERAL		✓					
CKM_SHA224_RSA_PKCS		✓					
CKM_SHA224_RSA_PKCS_PSS		✓					
CKM_SHA224_KEY_DERIVATION							✓
CKM_AES_CTR	✓						

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Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_AES_GCM	✓						
CKM_AES_CCM	✓						
CKM_AES_OFB	✓					✓	

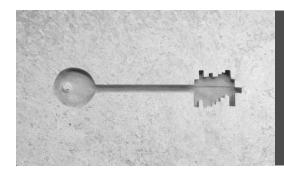




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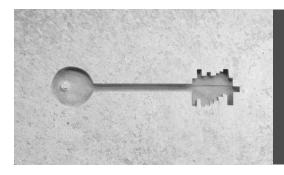
Mechanism	Function Encrypt &	Sign &	1		Gen. Key	Wrap &	
	Decrypt	Verify	SR & VR ¹	Digest	(Pair)	Unwrap	Derive
CKM_AES_GMAC		✓					
CKM_SHA3_224_RSA_PKCS		✓					
CKM_SHA3_256_RSA_PKCS		✓					
CKM_SHA3_384_RSA_PKCS		✓					
CKM_SHA3_512_RSA_PKCS		✓					
CKM_SHA3_224_RSA_PKCS_PSS		✓					
CKM_SHA3_256_RSA_PKCS_PSS		✓					
CKM_SHA3_384_RSA_PKCS_PSS		✓					
CKM_SHA3_512_RSA_PKCS_PSS		✓					
CKM_DSA_SHA3_224		✓					
CKM_DSA_SHA3_256		✓					
CKM_DSA_SHA3_384		✓					
CKM_DSA_SHA3_512		✓					
CKM_SHA3_224				✓			
CKM_SHA3_224_HMAC		✓					
CKM_SHA3_224_HMAC_GENERAL		✓					
CKM_SHA3_224_KEY_DERIVATION							✓





Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_SHA3_256				✓			
CKM_SHA3_256_HMAC		✓					
CKM_SHA3_256_HMAC_GENERAL		✓					
CKM_SHA3_256_KEY_DERIVATION							✓
CKM_SHA3_384				✓			
CKM_SHA3_384_HMAC		✓					
CKM_SHA3_384_HMAC_GENERAL		✓					
CKM_SHA3_384_KEY_DERIVATION							✓
CKM_SHA3_512				✓			
CKM_SHA3_512_HMAC		✓					
CKM_SHA3_512_HMAC_GENERAL		✓					
CKM_SHA3_512_KEY_DERIVATION							✓





PKCS#11 Vendor Defined Mechanisms

Mechanism	Function						
	Encrypt & Decrypt	Sign & Verify	SR & VR ¹	Digest	Gen. Key (Pair)	Wrap & Unwrap	Derive
CKM_ECDSA_RIPEMD160		✓					
CKM_ECDSA_SHA3_224		✓					
CKM_ECDSA_SHA3_256		✓					
CKM_ECDSA_SHA3_384		✓					
CKM_ECDSA_SHA3_512		✓					
CKM_DSA_RIPEMD160		✓					
CKM_DES3_RETAIL_MAC		✓					
CKM_RSA_PKCS_MULTI		√ 4,5					
CKM_RSA_X_509_MULTI		√ 4,5					
CKM_ECDSA_MULTI		√ 4,5					
CKM_DES_CBC_WRAP						✓	
CKM_AES_CBC_WRAP						✓	
CKM_ECKA		√ 4					
CKM_ECDSA_ECIES	√2						

¹ SR = SignRecover, VR = VerifyRecover

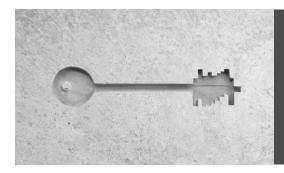
² Single-part operations only

⁴ Single-part sign operations only

³ Mechanism can only be used for wrapping, not unwrapping

 $^{^{\}rm 5}\,{\rm Mechanism}$ can only be used for signing, not for verification



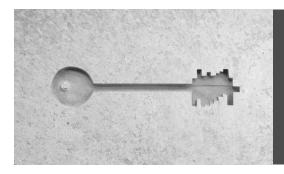


2 PKCS#11 Functions

The following table is based on PKCS#11 specification version 2.20. It lists all functions as defined by the standard. Functions supported by SecurityServer 4.10 are marked with a ✓ character. Functions not supported by SecurityServer 4.10 are implemented as function stub which returns CKR_FUNCTION_NOT_SUPPORTED; they are marked with a -- character.

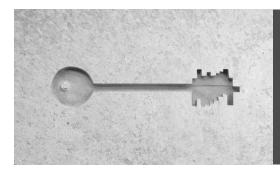
Function	Description	Supported
General purpose functions	S	
C_Initialize	initializes Cryptoki	✓
C_Finalize	clean up miscellaneous Cryptoki associated resources	✓
C_GetInfo	obtains general information about Cryptoki	✓
C_GetFunctionList	obtains entry points of Cryptoki library functions	✓
Slot and token manageme	nt functions	
C_GetSlotList	obtains a list of slots in the system	✓
C_GetSlotInfo	obtains information about a particular slot	✓
C_GetTokenInfo	obtains information about a particular token	✓
C_WaitForSlotEvent	waits for a slot event (token insertion, removal, etc.) to occur	
C_GetMechanismList	obtains a list of mechanisms supported by a token	✓
C_GetMechanismInfo	obtains information about a particular mechanism	✓
C_InitToken	initializes a token	✓
C_InitPIN	initializes the normal user's PIN	✓
C_SetPIN	modifies the PIN of the current user	✓





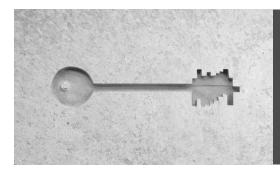
Function	Description	Supported
Session management fund	ctions	
C_OpenSession	opens a connection between an application and a particular token or sets up an application callback for token insertion	✓
C_CloseSession	closes a session	✓
C_CloseAllSessions	closes all sessions with a token	✓
C_GetSessionInfo	obtains information about the session	✓
C_GetOperationState	obtains the cryptographic operations state of a session	
C_SetOperationState	sets the cryptographic operations state of a session	
C_Login	logs into a token	✓
C_Logout	logs out from a token	✓
Object management funct	ions	
C_CreateObject	creates an object	✓
C_CopyObject	creates a copy of an object	✓
C_DestroyObject	destroys an object	✓
C_GetObjectSize	obtains the size of an object in bytes	✓
C_GetAttributeValue	obtains an attribute value of an object	✓
C_SetAttributeValue	modifies an attribute value of an object	✓
C_FindObjectsInit	initializes an object search operation	✓
C_FindObjects	continues an object search operation	✓
C_FindObjectsFinal	finishes an object search operation	✓





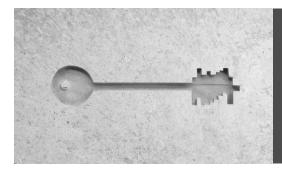
Function	Description	Supported
Encryption functions		
C_EncryptInit	initializes an encryption operation	✓
C_Encrypt	encrypts single-part data	✓
C_EncryptUpdate	continues a multiple-part encryption operation	✓
C_EncryptFinal	finishes a multiple-part encryption operation	✓
Decryption functions		
C_DecryptInit	initializes a decryption operation	✓
C_Decrypt	decrypts single-part encrypted data	✓
C_DecryptUpdate	continues a multiple-part decryption operation	✓
C_DecryptFinal	finishes a multiple-part decryption operation	✓
Message digesting func	tions	
C_DigestInit	initializes a message-digesting operation	✓
C_Digest	digests single-part data	✓
C_DigestUpdate	continues a multiple-part digesting operation	✓
C_DigestKey	digests a key	✓
C_DigestFinal	finishes a multiple-part digesting operation	✓
Signing and MACing fun	ctions	
C_SignInit	initializes a signature operation	✓
C_Sign	signs single-part data	✓





Function	Description	Supported
C_SignUpdate	continues a multiple-part signature	✓
C_SignFinal	finishes a multiple-part signature operation	✓
C_SignRecoverInit	initializes a signature operation, where the data can be recovered from the signature	✓
C_SignRecover	signs single-part data, where the data can be recovered from the signature	✓
Functions for verifying signa	tures and MACs	
C_VerifyInit	initializes a verification operation	✓
C_Verify	verifies a signature on single-part data and MACs	✓
C_VerifyUpdate	continues a multiple-part verification operation	✓
C_VerifyFinal	finishes a multiple-part verification operation	✓
C_VerifyRecoverInit	initializes a verification operation where the data is recovered from the signature	✓
C_VerifyRecover	verifies a signature on single-part data, where the data is recovered from the signature	✓
Dual-purpose cryptographic	functions	
C_DigestEncryptUpdate	continues simultaneous multiple-part digesting and encryption operations	✓
C_DecryptDigestUpdate	continues simultaneous multiple-part decryption and digesting operations	✓
C_SignEncryptUpdate	continues simultaneous multiple-part signature and encryption operations	✓
C_DecryptVerifyUpdate	continues simultaneous multiple-part decryption and verification operations	✓
Key management functions		
C_GenerateKey	generates a secret key	✓
C_GenerateKeyPair	generates a public-key/private-key pair	✓





Function	Description	Supported
C_WrapKey	wraps (encrypts) a key	✓
C_UnwrapKey	unwraps (decrypts) a key	✓
C_DeriveKey	derives a key from a base key	✓
Random number generation fu	nctions	
C_SeedRandom	mixes in additional seed material to the random number generator	✓
C_GenerateRandom	generates random data	✓
Parallel function management	functions	
C_GetFunctionStatus	legacy function which always returns CKR_FUNCTION_NOT_PARALLEL	
C_CancelFunction	legacy function which always returns CKR_FUNCTION_NOT_PARALLEL	