TLS Stream & Socket API

Generated by Doxygen 1.9.2

Chapter 1

TLS Stream and Socket API

Release 1.2.0b
17.05.22

1.1 Motivation

Why this API is needed? For the TLS a underlying SSL-library must be used. The used SSL-library depends on the platform specific implementation (e.g. Botan on ICAS1, WolfSSL on ICAS3, ...). In additions the key management depends on the platform specific trust zone implementation, where the secure key operations are performed. The trust zone implementations depends on the used SoC's. All this specific platform implementations must be encapsulated for the application development.

Disclaimer: The sole idea of the TLS-Lib reference implementation is to define the API and show that it could work. It should give the application developer an idea of how to use TLS-Lib using the provided API. This software was written as a proof of concept and is in no way intended to be used in a production environment: It may contain defects & security flaws, and is not fully tested. Be sure to not use the implementation itself for production usage, only the API.

1.2 Communication

The diagram shows the example of the viwi based communication for some services. For instance the service distance must be transported in a secure manor, therefore the sSOA with TLS must be used (see the orange flow between the Distance Service Provider and the HMIs).

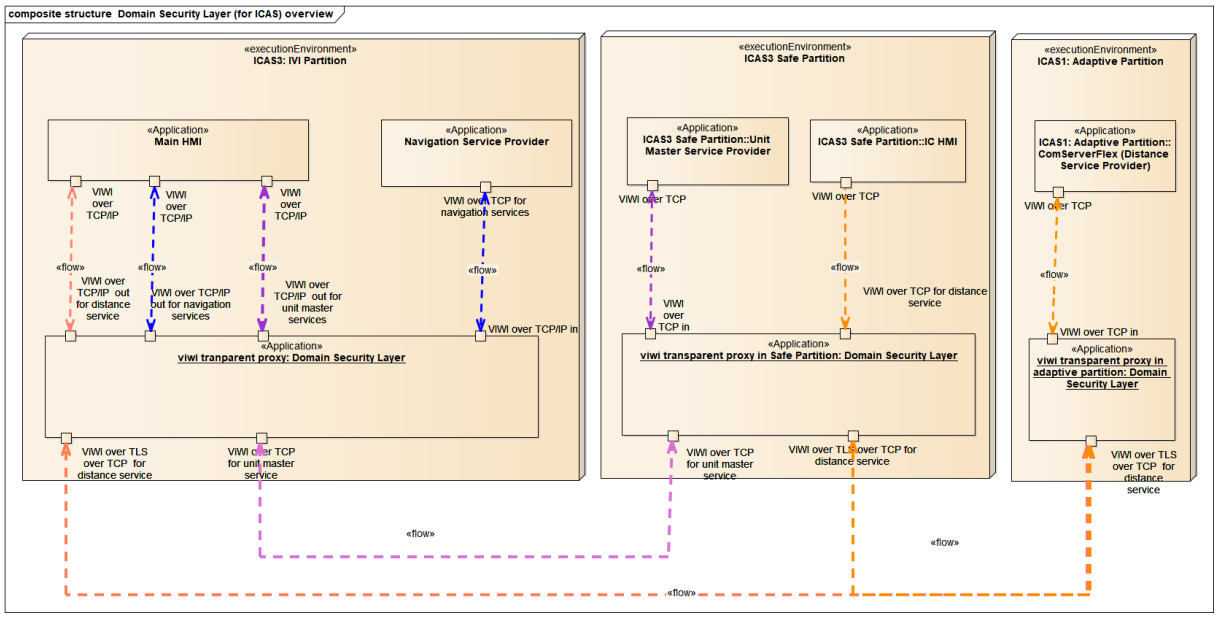


Figure 1.1 Domain Security Layer (for ICAS) overview

1.3 Using the API

Basically the API can be used for the

- **transparent proxy for the VIWI communication**
- **Clint Domain Proxy for the MOD communication (Socks5 & MQTT)**
- **GateWay for the MOD communication (Socks5 & MQTT)**

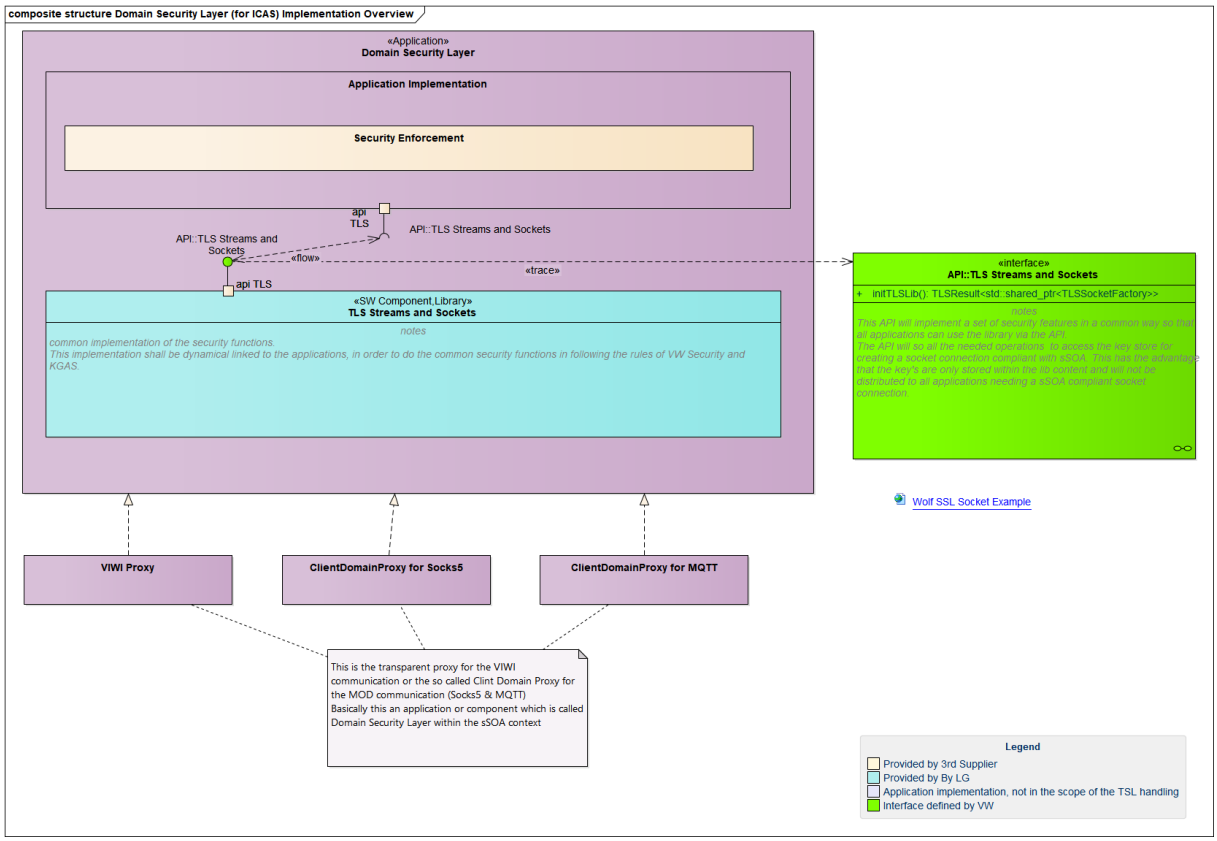


Figure 1.2 Domain Security Layer Implementation overview

1.4 MOD Special Handling

For the MOD CDP (Client Domain Proxy) a drop TLS is needed, because the stream between the application and the backend is already TLS encrypted and this TLS stream must be tunneled between the CDP and the OCU. For the connection between the CDP and the OCU the TSL-PSK have to be used and must be encrypted as long as the tunneled data steam is stable. >

Below the communication between an application using a MOD service and the backend service is shown. Logically the application will direct talk to the MOD service using TLS (please note this is connection will use the normal certificate based TLS handshake, which is different to the TLS-PSK handshake defined by the sSOA concept). Technically the application will not talk directly the backend service, but it will talk to the client domain proxy (CDP) which have to be located within the same execution environment (e.g. a virtual machine). From the CDP to the Gateway Proxy an tunnel is created where the TLS encrypted data stream is transferred. This tunnel will also be encrypted by TSL-PSK. Since double encryption make no sense and the OCU has a very week CPU the TLS-PSK encryption can be dropped after the connection to the backend is successfully established. >

Therefore we have the basic requirements

- **The TSL-PSK encryption shall be droppable by the client**
- **Dropping of the TSL-PSK encryption shall not lead to a data loss on the data stream.**

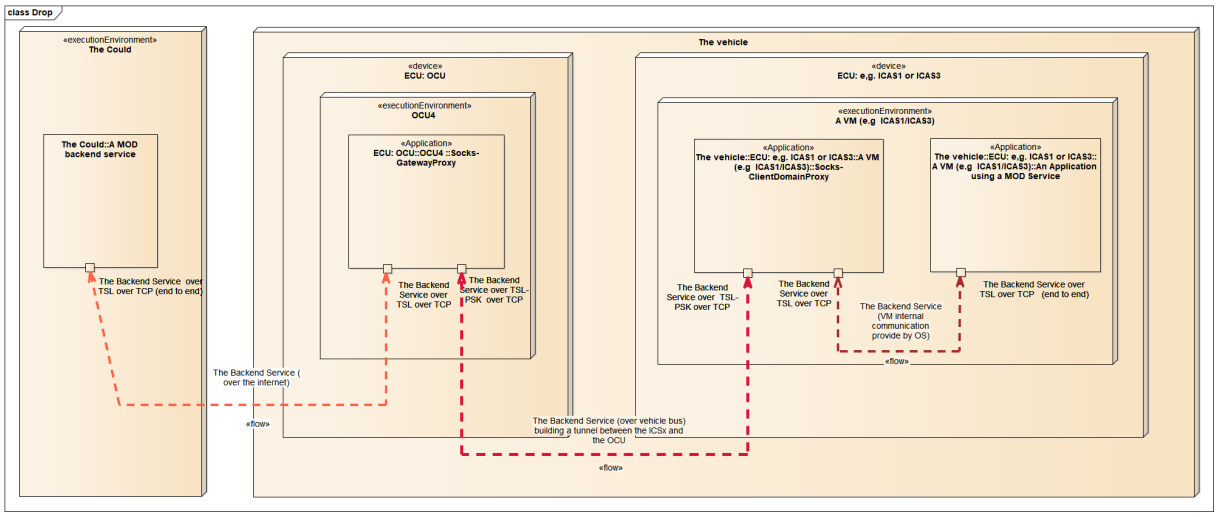


Figure 1.3 MOD Communication with Socks

1.5 Releases

The API release and the reference implementation can be found at "https://devstack.vwgroup.↩ com/bitbucket/projects/E3THIRD/repos/e3_security_tslapi/"

Version	Release Date	Branch	Tag	Notes
1.2.0b	17.05.22	SOP_ME4_2022	1.2.0b	• Merge changes from SOP↩ _ME4_2022 1.0.0k

Version	Release Date	Branch	Tag	Notes
1.2.0a	28.04.22	SOP_ME4_2022	1.2.0a	• Add client information string for logging • Register Wolfssl trace callback to TLS-↩ Library • Direct TLS-↩ Library logs into sys-log • Add makefile cappa dependencies to SYSAPI_↩ COLLECTION and FND_LOG • AAdd TLSCipher↩ SuiteUse↩ CasesSettings with Softfail Implemention
1.1.0k	16.05.22	SOP_ME3_2021	v1.1.0k	• Fix Botan engines (cert + psk) feed() remove internal buffer size constrain • copy ∗.tsv files for packaging • Handle Cmake error - do not ignore
1.1.0j	29.03.22	SOP_ME3_2021	v1.1.0j	• Added Android build variant (linux_amd64↩ _icc_sdk), for arm64-v8a, under Clang

Version	Release Date	Branch	Tag	Notes
1.1.0i	10.03.22	SOP_ME3_2021	v1.1.0i	• Migrated to wolfssl version 5.2.0 • A few changes made in order to switch from wolfssl version 4.8.1 to 5.2.0
1.1.0h	06.03.22	SOP_ME3_2021	v1.1.0h	• Added TLSAPI_↩ ENABLE↩ _OE3_↩ SPECIAL↩ _CERT_↩ HANLING for special handling for the O3 • TrM OCSP Caching does not work due to Cache-↩ IDs not being deterministic
1.1.0g	24.01.22	SOP_ME3_2021	v1.1.0g	• Fixed evaluation of public key pins according to RFC 7469, Sec.2.6. • Fixed hash pinning tests in the components tests.
1.1.0f	25.11.21	SOP_ME3_2021	v1.1.0f	• Updated gcc version 9.3.0. • Cleanup API documentation and fixed clang format. • Fixed CI/CD issues.

Version	Release Date	Branch	Tag	Notes
1.1.0e	23.09.21	SOP_ME3_2021	v1.1.0e	• Fixed linkage error.
1.1.0d	13.09.21	SOP_ME3_2021	v1.1.0d	• Added workaround to BEs scripts for CI/CD.
1.1.0	29.08.21	SOP_ME3_2021	v1.1.0c	• Updated to wolfssl-4.8.1. • Fixed hash pinning implementation due to crashing. • Deployment CI/CD scripts.
1.1.0b	07.07.21	SOP_ME3_2021	v1.1.0b	• Disable the OCSP requests in case of hard fail fallback mecahnism by enabling the flag ICAS3_↩ NO_OCSP_↩ HARD_FAIL due to ICAS3.
1.1.0	31.05.21	SOP_ME3_2021	v1.1.0a	• Added OCSP proxy client/server callbacks.
1.1.0RC4b	22.04.21	SOP_ME3_2021	v1.1.0RC4b	• Updated to WolfSSL-4.7.0. • Fixed memory leaks and valgrind warnings. • Added more unit tests.

Version	Release Date	Branch	Tag	Notes
1.1.0RC4a	01.03.21	SOP_ME3_2021	v1.1.0RC4a	• Fixed the key size check in WolfSSL PSKCallback to be no bigger than keyMax↩ Length. • Removed const from "to↩ IANAProtocol↩ Name" bool return value.
1.1.0RC3a	11.02.21	SOP_ME3_2021	v1.1.0RC3a	• Extension of use cases for cipher suite selection. • Added OCSP fallback mechanism. • Improved Unit Test (85% coverage). • Improved component test. • Improve connection process - success is depend on Hash-Pinning check in Wolf↩ SSL.
1.1.0RC2a	09.12.20	SOP_ME3_2021	v1.1.0RC2a	• Added authentic time check.
1.1.0RC1a	30.11.20	SOP_ME3_2021	v1.1.0RC1a	• Added alpn support.
1.0.4i	18.11.20	SOP_ME_2020	v1.0.4i	• Fall Back to no-mutex usage for wolfSSL_↩ shutdown.

Version	Release Date	Branch	Tag	Notes
1.0.4h	17.11.20	SOP_ME_2020	v1.0.4h	• Improved Unit Test. • Updated to WolfSSL 4.5.0. • TLS 1.3 support in WolfSSL cert-based engine. • Improved CMakefile and repository structure. • Fixed UserIOStream bug - return user implementaion in isOpen and isClose instead of defualt value. • Removed close server after failed "doSSLHandshake"
1.0.4g	29.10.20	SOP_ME_2020	v1.0.4g	• removed wolfSSL_CTX_set_verify - SSL_VERIFY_PEER mode is turned on by default
1.0.4f	26.10.20	SOP_ME_2020	v1.0.4f	• wolfSSL_get_peer_chain is used instead of wolfSSL_SESSION_get_peer_chain
1.0.4e	19.10.20	SOP_ME_2020	v1.0.4e	• Supported Elliptic Curves Extension with wolfSSL

Version	Release Date	Branch	Tag	Notes
1.0.4d	05.08.20	SOP_ME_2020	v1.0.4d	• Fixed the stream usage by distinguishing between the user's stream implementation and the library's stream implementation
1.0.4c	27.07.20	SOP_ME_2020	v1.0.4c	• Fixed the stream and the engines implementation to support multi-threaded systems
1.0.4b	22.06.20	SOP_ME_2020	v1.0.4b	• Fixed creation of multiple connections with different security levels & ports in wolfSSL PSK engine
1.0.4a	26.05.20	SOP_ME_2020	v1.0.4a	• Fixed creation of multiple connections with different security levels in wolfSSL PSK engine • Fixed stream closing on error issues • Minor naming, documentation and readability fixes
1.0.4	17.02.20	SOP_ME_2020	v1.0.4	• CiphersuitesId is represented by string • New Wolfssl version in use 4.3.0

Version	Release Date	Branch	Tag	Notes
1.0.3	15.01.20	SOP_ME_2020	v1.0.3	• Support single-sided authentication • Support multiple ciphersuites for cert-based • Support cert↩ Pinning using EC certificates • Updated documentation
1.0.2	01.12.19	SOP_ME_2020	v1.0.2	• Fix IOStream headers • Update Mock↩ TEE
1.0.1	03.11.19	SOP_ME_2020	v1.0.1	• Fixed API • Changed signedness of some parameters
1.0.0	02.09.19	SOP_ME_2020	v1.0.0	• Added server name indication (SNI) support • Fixed shutdown issues
1.0.0 RC8a	04.08.19	SOP_ME_2020	RC8a	• Replaced TEE mock • Added TEE error codes • Enabled usage of PSK key of size 256 & 512 in addition to 128 bit • Added functionality for creating socket on already accepted connection FD

Version	Release Date	Branch	Tag	Notes
1.0.0 RC7b	01.07.19	RC7		• added certificate pinning
1.0.0 RC7a	27.06.19	RC7	v1.0.0_RC7	• added OCSP stapling • added cert pinning (Botan only) • added support for TLS alert codes • extended botan for dropTLS support
1.0.0 RC6c	18.04.19	RC6c Cert POC		• Adaptions for the e3 SW-PAC
1.0.0 RC6b	18.04.19	RC6b PSK POC		• Adaptions for the e3 SW-PAC
1.0.0 RC6a	07.03.19	RC6_pre		• adding support for certificate based client • refactor botan engine • refactor wolfssl engine
1.0.0 RC5b	04.03.19	master		• fixed non-blocking send • fix IPv6 bind failure • added new logging mechanism

Version	Release Date	Branch	Tag	Notes
1.0.0 RC5a	18.02.19	master		• adding clinet/server hint • update of readme file, to refect the last deliries • cleanup of API • adding session creation using file-descriptor • separating the build process(engine and library)
1.0.0 RC4 Preview	05.12.18	rc4_pre		• Extension for viwi proxy: adding an factory to upgrade a server socket. • Extension for MOD to support certificate based TLS
1.0.0 RC3f	24.01.19	master		• adding test application • fixing readme. • adding gcov support
1.0.0 RC3e	17.01.19	master		• fix memory leaks
1.0.0 RC3d	16.12.18	master		• Adding support for non-blocking API calls

Version	Release Date	Branch	Tag	Notes
1.0.0 RC3c	06.12.18	master	v1.0.0_RC3c	• This version will only contain bug fixes. • FIX of IPv6 issues. • Fix return of send/receive is an enum (TLSEngine↩ Error) • Every accept in the server sockets creates a new engine
1.0.0 RC3b	15.11.18	master	v1.0.0_RC3b	• Complete the reference implementation. Adding missing function calls • Providing a verification suite which tests the implementation against the expectations. • changed to cmake for building the reference library and verification suite.
1.0.0 RC3a	05.11.18		v1.0.0_RC3a	• Adding Botan SSL Support to reference implementation.

Version	Release Date	Branch	Tag	Notes
1.0.0 RC3	30.10.18		v1.0.0_RC3	• ErrorHandler use shared_ptr for inet • ErrorHandler use enum for error code • InetAddress↩ Factory make ctor private. • add c++ style callbacks • improve return code – setters to ctors • using Lamda expression for callback • provide a initial reference implementation
Preview for 1.0.0 RC3	25.10.18	preview_1.0.0_RC3		• ErrorHandler use shared_ptr for inet • ErrorHandler use enum for error code • InetAddress↩ Factory make ctor private. • add c++ style callbacks • improve return code – setters to ctors

Version	Release Date	Branch	Tag	Notes
1.0.0 RC2	22.10.18	master	v1.0.0_RC2	• update of return codes (new codes added). • adding reference implementation of tlsLibrary. • adding reference project providing server and client samples.
1.0.0 RC1	22.10.18	master		• Initial Version

Chapter 2

Deprecated List

Member vwg::tls::ITLSSocketFactory::createTlsClient (const std::shared_ptr< IOStream > stream, const std::string &hostName, const CertStoreID &certStoreId, const ClientCertificateSetID &client↩ CertificateSetID, const CipherSuiteIds &cipherSuiteIds, const TimeCheckTime &checkTime, const std↩ ::vector< HashSha256 > &httpPublicKeyPinningHashs, const bool revocationCheckEnabled=false)=0

this method becomes deprecated since 1.1.0, please use method with ALPN support.

Chapter 3

Namespace Index

3.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 4

Hierarchical Index

4.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 5

Class Index

5.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 6

File Index

6.1 File List

Here is a list of all files with brief descriptions:

Chapter 7

Namespace Documentation

7.1 vwg Namespace Reference

This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.

Namespaces

- namespace tls
- namespace types

7.1.1 Detailed Description

This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.

7.2 vwg::tls Namespace Reference

Classes

- class AlpnMode

  A setting container for ALPN supporting. There are basically three modes possible:
- class IANAProtocolFunction

  This class contains some helper methods when conversion from the IANAProtocol enum value to Protocol name.
- class IInetAddress

  Representation an interface of an IP address. Basically this will give you an immutable IP address interface.
- class InetAddressFactory

  This a definition of a the factory to create instances of the IInetAddress. The supplier has to provide the implementation of the static methods by this class. Basically there is no need to create an instance of this class.
- class IOStream

  Representation an interface of an I/O stream. Can read, write and close.
- class ITLSClientSocket

Server TLS-PSK aware client socket interface. This interface must be implemented by the supplier.

- class ITLSErrorListener
- class ITLSOcspHandler

  This interface defines APIs to process and handle OCSP messages.
- class ITLSServerSocket

  Server TLS-PSK aware server socket interface. This interface must be implemented by the supplier.
- class ITLSSessionEndpoint

  Represents a communication session between a service provider and a service consumer. This interface must be implemented by the supplier.
- class ITLSSocketBase

  This is an interface which defines a set of operation and features have to be available on each socket and session endpoint.
- class ITLSSocketFactory

  This is the interface of the socket factory. One need to get an instance of this interface to create a server or a client socket. Use the function initTLSLib to get the instance of the factory. The implementation will have only one instance of the factory.
- struct TimeCheckTime

  This is a structure that will be used to pass the authentic time. basically this time will be compared with the system time, as shown below.
- class TLSConnectionSettings

  this class is used to define the TLS connection properties for a backend TLS connection. This class contains a set of configuration properties for the TLS connection.
- class TLSOcspCachedResponse

  This class represents a cached OCSP response message.
- class TLSOcspRequest

  This class represents a wrapper for a raw OCSP request message.
- class TLSOcspRequestResponse

  This class represents a wrapper for a raw OCSP response message which used as a result object from the OCSP. Proxy process after requests processing.
- struct TLSResult

  This is a struct to return the return code or the value in case the operation is performed successful. Basically it will take a payload or an return code. One can assume that the paylod is empty if the operation failed. One have to use failed or succeeded first to check if the payload is set or not first. Currently it is assumed that the access of a empty payload will fail and an error is raised.

Typedefs

- using CipherSuiteIds = std::string
- using SPIInetAddress = std::shared_ptr< IInetAddress >
- using IInetAddressResult = TLSResult< SPIInetAddress >
- using ApiVersionType = std::string
- typedef void(* ErrorHandler) (SPIInetAddress inet, const UInt16 port, const TLSReturnCodes errorCode)
- using SPITLSSessionEndpoint = std::shared_ptr< ITLSSessionEndpoint >
- using TLSSessionStatusListener = std::function< void(SPITLSSessionEndpoint endpoint, const TLSSessionStatus status)>
- using TLSDropStatusListener = std::function< void(SPITLSSessionEndpoint endpoint, const TLSDropStatus status)>
- using SPTLSSessionEndpoint = std::shared_ptr< ITLSSessionEndpoint >
- using TLSSessionEndpointResult = TLSResult< SPTLSSessionEndpoint >
- using ClientCertificateSetID = std::string
- using HashSha256 = std::vector< char >
- using CertStoreID = std::string
- using ITLSSocketFactoryResult = TLSResult< std::shared_ptr< ITLSSocketFactory > >
- using SPTLSClientSocket = std::shared_ptr< ITLSClientSocket >
- using SPTLSServerSocket = std::shared_ptr< ITLSServerSocket >
- using TLSClientSocketResult = TLSResult< SPTLSClientSocket >
- using TLSServerSocketResult = TLSResult< SPTLSServerSocket >

Enumerations

- enum CipherSuiteId : vwg::types::UInt16 {
  TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA9 , TLS_ECDHE_ECDSA_WITH_AES_256_GCM_S
  = 0xC02C , TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 = 0xC02B , TLS_ECDHE_RSA_WITH_AES_256_GCM_S
  = 0xC030 ,
  TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 = 0xC02F , TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
  = 0x009F , TLS_DHE_RSA_WITH_AES_128_GCM_SHA256 = 0x009E , TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA2
  = 0xC023 ,
  TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA8 , TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SH
  = 0xCCAA , TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA = 0xC009 , TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SH
  = 0xC00A ,
  TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256 = 0xC027 , TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
  = 0xC013 , TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA = 0xC014 , TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
  = 0x0067 ,
  TLS_DHE_RSA_WITH_AES_256_CBC_SHA256 = 0x006B , TLS_RSA_WITH_AES_128_GCM_SHA256 =
  0x009C , TLS_RSA_WITH_AES_256_GCM_SHA384 = 0x009D , TLS_RSA_WITH_AES_128_CBC_SHA256
  = 0x003C ,
  TLS_RSA_WITH_AES_256_CBC_SHA256 = 0x003D , TLS_RSA_WITH_AES_128_CBC_SHA = 0x002F ,
  TLS_RSA_WITH_AES_256_CBC_SHA = 0x0035 , TLS_RSA_WITH_3DES_EDE_CBC_SHA = 0x000A }

  This enum defines the list of permitted cipher suits.
- enum StreamReturnCode { RC_STREAM_WOULD_BLOCK = -1 , RC_STREAM_IO_ERROR = -2 }

  Error values for receiving or sending data.
- enum IANAProtocol { NONE = 0 , HTTP = 1 , HTTP2 = 2 }

  This enum defines the supported protocols which can be used in case ALPN is used. Please see the IANAProtocol definitions in RFC7230 https://tools.ietf.org/html/rfc7230.
- enum TLSCipherSuiteUseCasesSettings : UInt32 {
  CSUSDefault = 0 , CSUSLegacy = 1 , CSUSLongtermSecure = 2 , CSUSIanaRecommended = 3 ,
  CSUSDefaultWithSoftFail = 4 , CSUSEndOfEnum }
- enum SecurityLevel : UInt32 { AUTHENTIC_WITHPSK = 0 , CONFIDENTIAL_WITHPSK = 1 }

  Defines the SSOA confidentiality.
- enum SocketType : UInt32 { SOCKETTYPE_STREAM = 0 , SOCKETTYPE_DATAGRAM = 1 }

  Defines the socket type.
- enum TLSDropSuppot : UInt32 { TLS_NOT_DROPABLE = 0 , TLS_DROPABLE = 1 }
- enum TLSReturnCodes : Int32 {
  RC_TLS_SUCCESSFUL = 0 , RC_TLS_INIT_FAILED = 1 , RC_TLS_CONNECT_FAILED , RC_TLS_ACCEPT_FAILED
  ,
  RC_TLS_INVALID_DOMAIN , RC_TLS_KEY_MISSING , RC_TLS_KEY_ERROR , RC_TLS_USAGE_AFTER_CLEANUP
  ,
  RC_TLS_IO_ERROR , RC_TLS_WOULD_BLOCK_READ , RC_TLS_WOULD_BLOCK_WRITE ,
  RC_TLS_PEER_CLOSED ,
  RC_TLS_AUTHENTIC_TIMECHECK_FAILED , RC_TLS_MAX_PERMITTED_DEVIATION , RC_TLS_SEND_AFTER_SHUTD
  , RC_TLS_INVALID_IP = 1000 ,
  RC_TLS_DROPPING_NOTSUPPORTED , RC_TLS_DROPPING_FAILED , RC_TLS_PUBLIC_KEY_PINNING_FAILED
  , RC_TLS_UNEXPECTED_MESSAGE = 2010 ,
  RC_TLS_BAD_RECORD_MAC = 2020 , RC_TLS_RECORD_OVERFLOW = 2022 , RC_TLS_DECOMPRESSION_FAILURE
  = 2030 , RC_TLS_HANDSHAKE_FAILURE = 2040 ,
  RC_TLS_BAD_CERTIFICATE = 2042 , RC_TLS_UNSUPPORTED_CERTIFICATE = 2043 , RC_TLS_CERTIFICATE_REVOKE
  = 2044 , RC_TLS_CERTIFICATE_EXPIRED = 2045 ,
  RC_TLS_CERTIFICATE_UNKNOWN = 2046 , RC_TLS_ILLEGAL_PARAMETER = 2047 , RC_TLS_UNKOWN_CA
  = 2048 , RC_TLS_UNKNOWN_CA = 2048 ,
  RC_TLS_ACCESS_DENIED = 2049 , RC_TLS_DECODE_ERROR = 2050 , RC_TLS_DECRYPT_ERROR
  = 2051 , RC_TLS_PROTOCOL_VERSION = 2070 ,
  RC_TLS_INSUFFICIENT_SECURITY = 2071 , RC_TLS_NO_RENEGOTIATION = 2100 , RC_TLS_UNSUPPORTED_EXTENS
  = 2110 , RC_TLS_NO_APPLICATION_PROTOCOL = 2120 ,
  RC_TLS_TEE_ACCESS_ERROR = 3000 , RC_TLS_CERTSTORE_NOT_FOUND , RC_TLS_UNKNOWN_CLIENT_CERTIFIC
  , RC_TLS_CLIENT_CERTIFICATE_SET_IDERROR ,
  RC_TLS_PROGRAMMING_ERROR_RESULT = -1000 }

- enum TLSDropStatus : UInt32 { TLSDROP_SECURED , TLSDROP_DROPPED , TLSDROP_REQUESTED , TLSDROP_SEND_LOCKED , TLSDROP_PERFORMED }
- enum TLSSessionStatus : UInt32 { TLSSESSION_SECURED , TLSSESSION_UNSECURED , TLSSESSION_BROKEN , TLSSESSION_CLOSED }

  Defines the possible status values of the session.

Functions

- const ApiVersionType ApiVersion ("TLS_API_1.2.0")
- ITLSSocketFactoryResult initTLSLib ()

  This is the entry point for the library. This will return the Socket factory when all initialization needed are successfully performed. These is basically initialization of:
- void cleanupTLSLib ()

  Use this method to cleanup the implementation. This can be used to cleanup the TLS library (e.g. Wolf SSL or Botan SSL). after this the ITLSSocketFactory will not return any socket instance.

Variables

- static const unsigned int MAX_PERMITTED_DEVIATION = 86400

  Defines the maximum permitted deviation of |expectedTime - system_time.now()|. since 1.1.0.
- static const TimeCheckTime CHECK_TIME_OFF = {0, 0}

  Defines that time check is not required.
- static const UInt32 DEFAULT_OCSP_ONLINE_TIMEOUT_MS = 30000

  Defines a default OCSP timeout in milliseconds.
- static const AlpnMode ALPN_OFF = AlpnMode(std::vector<IANAProtocol>{NONE})

  Defines that ALPN is off and the protocol is undecided, this is identical to TLS without any ALPN support.
- static const AlpnMode ALPN_DEFAULT = AlpnMode(std::vector<IANAProtocol>{HTTP})

  Defines the default ALPN.
- static const AlpnMode ALPN_HTTP2 = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2})

  Defines HTTP2 ALPN.
- static const AlpnMode ALPN_ANY = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2, IANAProtocol::HTTP})

  Defines all supported ALPN.
- static const std::string CSUSDefaultStr = "default"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.
- static const std::string CSUSDefaulWithSoftFailtStr = "default_with_soft_fail"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.
- static const std::string CSUSLegacyStr = "legacy"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLegacy for more detail.
- static const std::string CSUSLongtermSecureStr = "longterm_secure"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLongtermSecure for more detail.
- static const std::string CSUSIanaRecommendedStr = "iana_recommended"

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSIanaRecommended for more detail.

- const UInt32 MODE_BLOCKING = 0
- const UInt32 MODE_ASYNC = 1
- const int TLS_EOF = 0

  Defines the EOF value 0 in case that the connection is closed. This can happen if a closed on a socket is made and there are pending receive and send. Please be aware of that EOF is defined as -1.
- const ClientCertificateSetID CLINET_CERTICATE_SET_BASE = "BASE"

7.2.1 Typedef Documentation

7.2.1.1 ApiVersionType

```
using vwg::tls::ApiVersionType = typedef std::string
```

Definition at line 22 of file TLSApiTypes.h.

7.2.1.2 CertStoreID

```
using vwg::tls::CertStoreID = typedef std::string
```

Definition at line 26 of file TLSSocketFactory.h.

7.2.1.3 CipherSuiteIds

```
using vwg::tls::CipherSuiteIds = typedef std::string
```

Definition at line 45 of file CipherSuitesDefenitions.h.

7.2.1.4 ClientCertificateSetID

```
using vwg::tls::ClientCertificateSetID = typedef std::string
```

Definition at line 23 of file TLSSocketFactory.h.

7.2.1.5 ErrorHandler

```
typedef void(* vwg::tls::ErrorHandler) (SPIInetAddress inet, const UInt16 port, const TLSReturnCodes
errorCode)
```

Definition at line 973 of file TLSApiTypes.h.

7.2.1.6 HashSha256

```
using vwg::tls::HashSha256 = typedef std::vector<char>
```

Definition at line 25 of file TLSSocketFactory.h.

7.2.1.7 IInetAddressResult

```
using vwg::tls::IInetAddressResult = typedef TLSResult<SPIInetAddress>
```

Definition at line 106 of file InetAddress.h.

7.2.1.8 ITLSSocketFactoryResult

```
using vwg::tls::ITLSSocketFactoryResult = typedef TLSResult<std::shared_ptr<ITLSSocketFactory>
>
```

Definition at line 808 of file TLSSocketFactory.h.

7.2.1.9 SPIInetAddress

```
using vwg::tls::SPIInetAddress = typedef std::shared_ptr<IInetAddress>
```

Definition at line 101 of file InetAddress.h.

7.2.1.10 SPITLSSessionEndpoint

```
using vwg::tls::SPITLSSessionEndpoint = typedef std::shared_ptr<ITLSSessionEndpoint>
```

Definition at line 70 of file TLSSession.h.

7.2.1.11 SPTLSClientSocket

```
using vwg::tls::SPTLSClientSocket = typedef std::shared_ptr<ITLSClientSocket>
```

Definition at line 119 of file TLSSockets.h.

7.2.1.12 SPTLSServerSocket

```
using vwg::tls::SPTLSServerSocket = typedef std::shared_ptr<ITLSServerSocket>
```

Definition at line 120 of file TLSSockets.h.

7.2.1.13 SPTLSSessionEndpoint

```
using vwg::tls::SPTLSSessionEndpoint = typedef std::shared_ptr<ITLSSessionEndpoint>
```

Definition at line 276 of file TLSSession.h.

7.2.1.14 TLSClientSocketResult

```
using vwg::tls::TLSClientSocketResult = typedef TLSResult<SPTLSClientSocket>
```

Definition at line 121 of file TLSSockets.h.

7.2.1.15 TLSDropStatusListener

```
using vwg::tls::TLSDropStatusListener = typedef std::function<void(SPITLSSessionEndpoint endpoint,
const TLSDropStatus status)>
```

Definition at line 82 of file TLSSession.h.

7.2.1.16 TLSServerSocketResult

```
using vwg::tls::TLSServerSocketResult = typedef TLSResult<SPTLSServerSocket>
```

Definition at line 122 of file TLSSockets.h.

7.2.1.17 TLSSessionEndpointResult

```
using vwg::tls::TLSSessionEndpointResult = typedef TLSResult<SPTLSSessionEndpoint>
```

Definition at line 277 of file TLSSession.h.

7.2.1.18 TLSSessionStatusListener

```
using vwg::tls::TLSSessionStatusListener = typedef std::function<void(SPITLSSessionEndpoint
endpoint, const TLSSessionStatus status)>
```

Definition at line 76 of file TLSSession.h.

7.2.2 Enumeration Type Documentation

7.2.2.1 CipherSuiteId

```
enum vwg::tls::CipherSuiteId :  vwg::types::UInt16
```

This enum defines the list of permitted cipher suits.

Enumerator

TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256	
TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	
TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	
TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	
TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	
TLS_DHE_RSA_WITH_AES_256_GCM_SHA384	
TLS_DHE_RSA_WITH_AES_128_GCM_SHA256	
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	
TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256	
TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256	
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	
TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA	
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	
TLS_DHE_RSA_WITH_AES_128_CBC_SHA256	
TLS_DHE_RSA_WITH_AES_256_CBC_SHA256	
TLS_RSA_WITH_AES_128_GCM_SHA256	
TLS_RSA_WITH_AES_256_GCM_SHA384	
TLS_RSA_WITH_AES_128_CBC_SHA256	
TLS_RSA_WITH_AES_256_CBC_SHA256	
TLS_RSA_WITH_AES_128_CBC_SHA	
TLS_RSA_WITH_AES_256_CBC_SHA	
TLS_RSA_WITH_3DES_EDE_CBC_SHA	

Definition at line 16 of file CipherSuitesDefenitions.h.

7.2.2.2 IANAProtocol

enum vwg::tls::IANAProtocol

This enum defines the supported protocols which can be used in case ALPN is used. Please see the IANAProtocol definitions in RFC7230 https://tools.ietf.org/html/rfc7230.

Since

1.1.0

Enumerator

NONE	
HTTP	
HTTP2	

Definition at line 31 of file TLSApiTypes.h.

7.2.2.3 SecurityLevel

enum vwg::tls::SecurityLevel : UInt32

Defines the SSOA confidentiality.

AUTHENTIC_WITHPSK defines PSK connection with authentication.

CONFIDENTIAL_WITHPSK defines confidential PSK connection.

Enumerator

AUTHENTIC_WITHPSK	
CONFIDENTIAL_WITHPSK	

Definition at line 951 of file TLSApiTypes.h.

7.2.2.4 SocketType

enum vwg::tls::SocketType : UInt32

Defines the socket type.

SOCKETTYPE_STREAM Stream socket.

SOCKETTYPE_DATAGRAM Datagram socket.

Enumerator

SOCKETTYPE_STREAM	
SOCKETTYPE_DATAGRAM	

Definition at line 960 of file TLSApiTypes.h.

7.2.2.5 StreamReturnCode

```
enum vwg::tls::StreamReturnCode
```

Error values for receiving or sending data.

Enumerator

RC_STREAM_WOULD_BLOCK	
RC_STREAM_IO_ERROR	

Definition at line 18 of file IOStream.h.

7.2.2.6 TLSCipherSuiteUseCasesSettings

```
enum vwg::tls::TLSCipherSuiteUseCasesSettings : UInt32
```

this enum defines the possible setting cipher suits based on predefined use cases. This will replace the cipher suite list. Especially in case of using TLS1.2 and TLS1.3 in parallel, it may will be more complex. In addition the ECC curves are currently not covered sufficient in the TLS1.0.x. Instead of using the list of cipher suites, a set of use cases can will be defined. Based on the use cases the cipher suites are selected.

Please see https://devstack.vwgroup.com/jira/browse/IMAN-46128 for the cipher suits associted to the use cases.

CSUSDefault This defines the default cipher suite set, which is defined for in the according QHAL. This is the default for all MOD functions.

- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_128_GCM_SHA256 (TLS1.3 only)
- TLS_AES_256_GCM_SHA384 (TLS1.3 only)
- TLS_CHACHA20_POLY1305_SHA256 (TLS1.3 only)

CSUSDefaultWithSoftFail This contains the same cyphier suite set as CSUSDefault. The difference to CSUSDefault, is the beaviour of the revocation check. For CSUSDefaultWithSoftFail the revocation check will use the "soft fail" schema.

since 1.2.0

CSUSLegacy This defines the set which contains biggest set of cipher suites. This is intended for all use case where the access to the internet is needed. Use cases are online radio, which is using all possible server, which are not under the control of MOD.

- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_128_GCM_SHA256 (TLS1.3 only)
- TLS_AES_256_GCM_SHA384 (TLS1.3 only)
- TLS_CHACHA20_POLY1305_SHA256 (TLS1.3 only)
- TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
- TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
- TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
- TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_256_GCM_SHA384
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA
- TLS_AES_128_CCM_SHA256 (TLS1.3 only)

CSUSLongtermSecure This is most restrictive, this will only contain the cipher suites with high key length. It is expected that these cipher suites are most secured for the next years.

- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_256_GCM_SHA384 (TLS1.3 only)
- TLS_CHACHA20_POLY1305_SHA256 (TLS1.3 only)

CSUSIanaRecommended This is the list of cipher suites which are recommended by IANA.

- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_128_GCM_SHA256 (TLS1.3 only)
- TLS_AES_256_GCM_SHA384 (TLS1.3 only)
- TLS_CHACHA20_POLY1305_SHA256 (TLS1.3 only)
- TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_AES_128_CCM_SHA256 (TLS1.3 only)

Since

1.1.0

Enumerator

CSUSDefault	
CSUSLegacy	
CSUSLongtermSecure	
CSUSIanaRecommended	
CSUSDefaultWithSoftFail	
CSUSEndOfEnum	

Definition at line 329 of file TLSApiTypes.h.

7.2.2.7 TLSDropStatus

```
enum vwg::tls::TLSDropStatus : UInt32
```

Enumerator

TLSDROP_SECURED	
TLSDROP_DROPPED	
TLSDROP_REQUESTED	
TLSDROP_SEND_LOCKED	
TLSDROP_PERFORMED	

Definition at line 24 of file TLSSession.h.

7.2.2.8 TLSDropSuppot

```
enum vwg::tls::TLSDropSuppot : UInt32
```

Enumerator

TLS_NOT_DROPABLE	
TLS_DROPABLE	

Definition at line 962 of file TLSApiTypes.h.

7.2.2.9 TLSReturnCodes

```
enum vwg::tls::TLSReturnCodes : Int32
```

Enumerator

RC_TLS_SUCCESSFUL	
RC_TLS_INIT_FAILED	
RC_TLS_CONNECT_FAILED	
RC_TLS_ACCEPT_FAILED	
RC_TLS_INVALID_DOMAIN	This shall be returned when the domain name provided by the application is not valid according to the sSOA domain name specification.
RC_TLS_KEY_MISSING	this shall be returned in case there is no valid key for the provider consumer connection defined.
RC_TLS_KEY_ERROR	This shall be returned in case there will be a error to derive the session key from the PSK key. This error shall cover all the errors due to the trust zone handling. The library shall cover all diagnostic related requirements and created according trace information.
RC_TLS_USAGE_AFTER_CLEANUP	This error shall be returned when the library functions/class are used after calling the cleanup method.
RC_TLS_IO_ERROR	This shall be returned due to IO/protocol error.
RC_TLS_WOULD_BLOCK_READ	This shall be returned in non-blocking mode when the operation would block. The caller is advised to check the error code and repeat the operation when the socket is ready for read/write, according to the error code.
RC_TLS_WOULD_BLOCK_WRITE	
RC_TLS_PEER_CLOSED	This shall be returned due to peer unexpectedly closing the connection.
RC_TLS_AUTHENTIC_TIMECHECK_FAILED	This shall be returned due to authentic time check failed.
RC_TLS_MAX_PERMITTED_DEVIATION	This shall be returned if |permitted deviation (check time member)| >= MAX_PERMITTED_DEVIATION.
RC_TLS_SEND_AFTER_SHUTDOWN	This shall be returned due to attempting to send after shutdown.
RC_TLS_INVALID_IP	this will be returned, an invalid IP address is given by the user and the IP address validation failed.
RC_TLS_DROPPING_NOTSUPPORTED	
RC_TLS_DROPPING_FAILED	
RC_TLS_PUBLIC_KEY_PINNING_FAILED	
RC_TLS_UNEXPECTED_MESSAGE	
RC_TLS_BAD_RECORD_MAC	
RC_TLS_RECORD_OVERFLOW	
RC_TLS_DECOMPRESSION_FAILURE	
RC_TLS_HANDSHAKE_FAILURE	
RC_TLS_BAD_CERTIFICATE	
RC_TLS_UNSUPPORTED_CERTIFICATE	
RC_TLS_CERTIFICATE_REVOKED	
RC_TLS_CERTIFICATE_EXPIRED	
RC_TLS_CERTIFICATE_UNKNOWN	
RC_TLS_ILLEGAL_PARAMETER	
RC_TLS_UNKOWN_CA	
RC_TLS_UNKNOWN_CA	
RC_TLS_ACCESS_DENIED	

Enumerator

RC_TLS_DECODE_ERROR	
RC_TLS_DECRYPT_ERROR	
RC_TLS_PROTOCOL_VERSION	
RC_TLS_INSUFFICIENT_SECURITY	
RC_TLS_NO_RENEGOTIATION	
RC_TLS_UNSUPPORTED_EXTENSION	
RC_TLS_NO_APPLICATION_PROTOCOL	This is used for the ALPN extension, for details please see https://tools.ietf.org/rfc/rfc7301.txt chapter 3.2. In the event that the server supports no protocols that the client advertises, than this error is returned. **Since** 1.1.0
RC_TLS_TEE_ACCESS_ERROR	The TEE report an error while performing the operation. This can be either permission problem or other TEE specific problems.
RC_TLS_CERTSTORE_NOT_FOUND	The TEE does not contain a certificate store (aka “truststore” aka “root certificate bundle” in other docs) for given certStoreId. Depending on the library implementation and the used SSL implementation the message RC_TLS_UNKOWN_CA can be returned.
RC_TLS_UNKNOWN_CLIENT_CERTIFICATE_SET_ID	The given certificate set id is unknown. it shall be one of the permitted values CLINET_CERTICATE_SET_BASE = "BASE" or CLINET_CERTICATE_SET_VKMS = "VKMS" or the project specific.
RC_TLS_CLIENT_CERTIFICATE_SET_IDERROR	The TEE does not contain client certificate set and/or private key for given clientCertificateSetID. Depending on the library implementation and the used SSL implementation the message RC_TLS_NO_CERTIFICATE_RESERVED can be returned.
RC_TLS_PROGRAMMING_ERROR_RESULT	This error will be present if an invalid error message is created by the library. This will indicate a programming error of the library.

Definition at line 15 of file TLSReturnCodes.h.

7.2.2.10 TLSSessionStatus

```
enum vwg::tls::TLSSessionStatus : UInt32
```

Defines the possible status values of the session.

Enumerator

TLSSESSION_SECURED	TLSSESSION_SECURED shall be the default case. This indicates that the connection is active an security is active.

Enumerator

TLSSESSION_UNSECURED	TLSSESSION_UNSECURED is only be supported in case the TLS can be dropped. This indicates that the connection is active but security was dropped.
TLSSESSION_BROKEN	TLSSESSION_BROKEN indicates that a connection is not working anymore, due to errors.
TLSSESSION_CLOSED	TLSSESSION_CLOSED indicates that a connection is closed.

Definition at line 35 of file TLSSession.h.

7.2.3 Function Documentation

7.2.3.1 ApiVersion()

```
const ApiVersionType vwg::tls::ApiVersion (
            "TLS_API_1.2.0"  )
```

7.2.3.2 cleanupTLSLib()

```
void vwg::tls::cleanupTLSLib ( )
```

Use this method to cleanup the implementation. This can be used to cleanup the TLS library (e.g. Wolf SSL or Botan SSL). after this the ITLSSocketFactory will not return any socket instance.

7.2.3.3 initTLSLib()

```
ITLSSocketFactoryResult vwg::tls::initTLSLib ( )
```

This is the entry point for the library. This will return the Socket factory when all initialization needed are successfully performed. These is basically initialization of:

- the TLS/SSL library
- communication to the trust zone

Returns

the TLSSocketFactory or an error code.

7.2.4 Variable Documentation

7.2.4.1 ALPN_ANY

```
const AlpnMode vwg::tls::ALPN_ANY = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2,
IANAProtocol::HTTP})  [static]
```

Defines all supported ALPN.

Definition at line 226 of file TLSApiTypes.h.

7.2.4.2 ALPN_DEFAULT

```
const AlpnMode vwg::tls::ALPN_DEFAULT = AlpnMode(std::vector<IANAProtocol>{HTTP})  [static]
```

Defines the default ALPN.

Definition at line 216 of file TLSApiTypes.h.

7.2.4.3 ALPN_HTTP2

```
const AlpnMode vwg::tls::ALPN_HTTP2 = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2})
[static]
```

Defines HTTP2 ALPN.

Definition at line 221 of file TLSApiTypes.h.

7.2.4.4 ALPN_OFF

```
const AlpnMode vwg::tls::ALPN_OFF = AlpnMode(std::vector<IANAProtocol>{NONE})  [static]
```

Defines that ALPN is off and the protocol is undecided, this is identical to TLS without any ALPN support.

Definition at line 211 of file TLSApiTypes.h.

7.2.4.5 CHECK_TIME_OFF

```
const TimeCheckTime vwg::tls::CHECK_TIME_OFF = {0, 0}  [static]
```

Defines that time check is not required.

Definition at line 116 of file TLSApiTypes.h.

7.2.4.6 CLINET_CERTICATE_SET_BASE

```
const ClientCertificateSetID vwg::tls::CLINET_CERTICATE_SET_BASE = "BASE"
```

Definition at line 24 of file TLSSocketFactory.h.

7.2.4.7 CSUSDefaultStr

```
const std::string vwg::tls::CSUSDefaultStr = "default"  [static]
```

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.

Since

1.1.0

Definition at line 346 of file TLSApiTypes.h.

7.2.4.8 CSUSDefaulWithSoftFailtStr

```
const std::string vwg::tls::CSUSDefaulWithSoftFailtStr = "default_with_soft_fail"  [static]
```

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.

Since

1.2.0

Definition at line 356 of file TLSApiTypes.h.

Referenced by vwg::tls::TLSConnectionSettings::TLSConnectionSettings().

7.2.4.9 CSUSIanaRecommendedStr

```
const std::string vwg::tls::CSUSIanaRecommendedStr = "iana_recommended"  [static]
```

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSIanaRecommended for more detail.

Since

1.1.0

Definition at line 384 of file TLSApiTypes.h.

Referenced by vwg::tls::TLSConnectionSettings::TLSConnectionSettings().

7.2.4.10 CSUSLegacyStr

```
const std::string vwg::tls::CSUSLegacyStr = "legacy"  [static]
```

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLegacy for more detail.

Since

1.1.0

Definition at line 366 of file TLSApiTypes.h.

Referenced by vwg::tls::TLSConnectionSettings::TLSConnectionSettings().

7.2.4.11 CSUSLongtermSecureStr

```
const std::string vwg::tls::CSUSLongtermSecureStr = "longterm_secure"  [static]
```

Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLongtermSecure for more detail.

Since

1.1.0

Definition at line 375 of file TLSApiTypes.h.

Referenced by vwg::tls::TLSConnectionSettings::TLSConnectionSettings().

7.2.4.12 DEFAULT_OCSP_ONLINE_TIMEOUT_MS

```
const UInt32 vwg::tls::DEFAULT_OCSP_ONLINE_TIMEOUT_MS = 30000  [static]
```

Defines a default OCSP timeout in milliseconds.

Definition at line 121 of file TLSApiTypes.h.

7.2.4.13 MAX_PERMITTED_DEVIATION

```
const unsigned int vwg::tls::MAX_PERMITTED_DEVIATION = 86400  [static]
```

Defines the maximum permitted deviation of |expectedTime - system_time.now()|. since 1.1.0.

Definition at line 84 of file TLSApiTypes.h.

7.2.4.14 MODE_ASYNC

```
const UInt32 vwg::tls::MODE_ASYNC = 1
```

Definition at line 942 of file TLSApiTypes.h.

7.2.4.15 MODE_BLOCKING

```
const UInt32 vwg::tls::MODE_BLOCKING = 0
```

Definition at line 941 of file TLSApiTypes.h.

7.2.4.16 TLS_EOF

```
const int vwg::tls::TLS_EOF = 0
```

Defines the EOF value 0 in case that the connection is closed. This can happen if a closed on a socket is made and there are pending receive and send. Please be aware of that EOF is defined as -1.

Definition at line 65 of file TLSSession.h.

7.3 vwg::types Namespace Reference

Typedefs

- using Boolean = bool
- typedef std::uint8_t UInt8
- typedef std::uint16_t UInt16
- typedef std::uint32_t UInt32
- typedef std::uint64_t UInt64
- typedef std::int8_t Int8
- typedef std::int16_t Int16
- typedef std::int32_t Int32
- typedef std::int64_t Int64
- using Byte = UInt8
- using UUID = std::array< UInt8, 16 >

7.3.1 Typedef Documentation

7.3.1.1 Boolean

```
using vwg::types::Boolean = typedef bool
```

Definition at line 13 of file vwgtypes.h.

7.3.1.2 Byte

```
using vwg::types::Byte = typedef UInt8
```

Definition at line 25 of file vwgtypes.h.

7.3.1.3 Int16

```
typedef std::int16_t vwg::types::Int16
```

Definition at line 21 of file vwgtypes.h.

7.3.1.4 Int32

```
typedef std::int32_t vwg::types::Int32
```

Definition at line 22 of file vwgtypes.h.

7.3.1.5 Int64

```
typedef std::int64_t vwg::types::Int64
```

Definition at line 23 of file vwgtypes.h.

7.3.1.6 Int8

```
typedef std::int8_t vwg::types::Int8
```

Definition at line 20 of file vwgtypes.h.

7.3.1.7 UInt16

```
typedef std::uint16_t vwg::types::UInt16
```

Definition at line 15 of file vwgtypes.h.

7.3.1.8 UInt32

```
typedef std::uint32_t vwg::types::UInt32
```

Definition at line 16 of file vwgtypes.h.

7.3.1.9 UInt64

```
typedef std::uint64_t vwg::types::UInt64
```

Definition at line 17 of file vwgtypes.h.

7.3.1.10 UInt8

```
typedef std::uint8_t vwg::types::UInt8
```

Definition at line 14 of file vwgtypes.h.

7.3.1.11 UUID

```
using vwg::types::UUID = typedef std::array<UInt8, 16>
```

Definition at line 28 of file vwgtypes.h.

Chapter 8

Class Documentation

8.1 vwg::tls::AlpnMode Class Reference

A setting container for ALPN supporting. There are basically three modes possible:

`#include <TLSApiTypes.h>`

Public Member Functions

- AlpnMode (const std::vector< std::string > &userDefinedAlpnSetting)
  Constructor.
- AlpnMode (const std::vector< IANAProtocol > &supportedProtocols)
  Constructor.
- virtual ~AlpnMode ()=default
- bool userDefinedALPNisUsed () const
  Gets a boolean that tells if the ALPN setting is defined.
- const std::vector< IANAProtocol > & getSupportedProtocols () const
  Gets Supported IANA protocols.
- const std::vector< std::string > & getUserDefinedAlpnSetting () const
  Gets an ALPN setting.

Private Attributes

- bool m_userDefinedALPNisUsed
- std::vector< std::string > m_userDefinedAlpnSetting
- std::vector< IANAProtocol > m_supportedProtocols

8.1.1 Detailed Description

A setting container for ALPN supporting. There are basically three modes possible:

a) ALPN can be provided as a user defined string list. In this case the protocol list is passed to the TLS library without no additional check. This means that an invalid value can cause unexpected errors, if an invalid string is used. The given string must be complaint to chapter "3.1. The Application-Layer Protocol Negotiation Extension" of RFC 7301.

b) ALPN parameter can be provided by a vector of pre defined enum's and constant of the ALPN mode type.

c) If an empty list vector is used, then ALPN is unused in the client hello. Basically this shall be identical like the the usage of HTTP protocol, but it can be different if the server is not supporting ALPN.

Since

1.1.0

Definition at line 140 of file TLSApiTypes.h.

8.1.2 Constructor & Destructor Documentation

8.1.2.1 AlpnMode() [1/2]

```
vwg::tls::AlpnMode::AlpnMode (
            const std::vector< std::string > & userDefinedAlpnSetting )  [inline], [explicit]
```

Constructor.

Parameters

in	*userDefinedAlpnSetting*	ALPN setting.

Definition at line 148 of file TLSApiTypes.h.

8.1.2.2 AlpnMode() [2/2]

```
vwg::tls::AlpnMode::AlpnMode (
            const std::vector< IANAProtocol > & supportedProtocols )  [inline], [explicit]
```

Constructor.

Parameters

in	*supportedProtocols*	Supported IANA protocols.

Definition at line 159 of file TLSApiTypes.h.

8.1.2.3 ~AlpnMode()

```
virtual vwg::tls::AlpnMode::~AlpnMode ( )  [virtual], [default]
```

8.1.3 Member Function Documentation

8.1.3.1 getSupportedProtocols()

```
const std::vector< IANAProtocol > & vwg::tls::AlpnMode::getSupportedProtocols ( ) const  [inline]
```

Gets Supported IANA protocols.

Returns

Supported IANA protocols.

Definition at line 185 of file TLSApiTypes.h.

References m_supportedProtocols.

8.1.3.2 getUserDefinedAlpnSetting()

```
const std::vector< std::string > & vwg::tls::AlpnMode::getUserDefinedAlpnSetting ( ) const
[inline]
```

Gets an ALPN setting.

Returns

ALPN setting.

Definition at line 196 of file TLSApiTypes.h.

References m_userDefinedAlpnSetting.

8.1.3.3 userDefinedALPNisUsed()

```
bool vwg::tls::AlpnMode::userDefinedALPNisUsed ( ) const  [inline]
```

Gets a boolean that tells if the ALPN setting is defined.

Returns

true if ALPN setting is defined, otherwise false.

Definition at line 174 of file TLSApiTypes.h.

References m_userDefinedALPNisUsed.

8.1.4 Member Data Documentation

8.1.4.1 m_supportedProtocols

```
std::vector<IANAProtocol> vwg::tls::AlpnMode::m_supportedProtocols  [private]
```

Definition at line 204 of file TLSApiTypes.h.

Referenced by getSupportedProtocols().

8.1.4.2 m_userDefinedALPNisUsed

```
bool vwg::tls::AlpnMode::m_userDefinedALPNisUsed  [private]
```

Definition at line 202 of file TLSApiTypes.h.

Referenced by userDefinedALPNisUsed().

8.1.4.3 m_userDefinedAlpnSetting

```
std::vector<std::string> vwg::tls::AlpnMode::m_userDefinedAlpnSetting  [private]
```

Definition at line 203 of file TLSApiTypes.h.

Referenced by getUserDefinedAlpnSetting().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.2 vwg::tls::IANAProtocolFunction Class Reference

This class contains some helper methods when conversion from the IANAProtocol enum value to Protocol name.

`#include <TLSApiTypes.h>`

Public Member Functions

- IANAProtocolFunction ()=default
- ~IANAProtocolFunction ()=default
- bool toIANAProtocolName (const IANAProtocol &protocol, std::string &oProtocolName)

  Converts IANAProtocol enum value to Protocol name.

Public Attributes

- const std::string ProtocolNameHTTP = "http/1.1"
- const std::string ProtocolNameHTTP2 = "h2"

8.2.1 Detailed Description

This class contains some helper methods when conversion from the IANAProtocol enum value to Protocol name.

Since

1.1.0

Definition at line 45 of file TLSApiTypes.h.

8.2.2 Constructor & Destructor Documentation

8.2.2.1 IANAProtocolFunction()

```
vwg::tls::IANAProtocolFunction::IANAProtocolFunction ( )  [default]
```

8.2.2.2 ~IANAProtocolFunction()

```
vwg::tls::IANAProtocolFunction::~IANAProtocolFunction ( )  [default]
```

8.2.3 Member Function Documentation

8.2.3.1 toIANAProtocolName()

```
bool vwg::tls::IANAProtocolFunction::toIANAProtocolName (
            const IANAProtocol & protocol,
            std::string & oProtocolName )  [inline]
```

Converts IANAProtocol enum value to Protocol name.

Parameters

in	*protocol*	IANA protocol enum value to be converted.
out	*oProtocolName*	should be contained the protocol name if converted successfully.

Returns

true if converted successfully, false otherwise.

Definition at line 63 of file TLSApiTypes.h.

References vwg::tls::HTTP, vwg::tls::HTTP2, ProtocolNameHTTP, and ProtocolNameHTTP2.

8.2.4 Member Data Documentation

8.2.4.1 ProtocolNameHTTP

```
const std::string vwg::tls::IANAProtocolFunction::ProtocolNameHTTP = "http/1.1"
```

Definition at line 51 of file TLSApiTypes.h.

Referenced by toIANAProtocolName().

8.2.4.2 ProtocolNameHTTP2

```
const std::string vwg::tls::IANAProtocolFunction::ProtocolNameHTTP2 = "h2"
```

Definition at line 52 of file TLSApiTypes.h.

Referenced by toIANAProtocolName().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.3 vwg::tls::IInetAddress Class Reference

Representation an interface of an IP address. Basically this will give you an immutable IP address interface.

```
#include <InetAddress.h>
```

Public Member Functions

- IInetAddress ()
- virtual ~IInetAddress ()=default
- virtual Boolean isIPv6 ()=0

  Checks if this a valid IPv6 address.
- virtual Boolean isIPv4 ()=0

  Checks if this is a valid IPv6 address.
- virtual std::string toString ()=0

  Makes a sting representation of the IP address.
- virtual Boolean isValid ()=0

  Checks if this is a valid IP address. basically this will always be true, because the factory InetAddressFactory will only return valid IInetAddress objects.
- virtual UInt32 validate ()=0

  Starts the IP address validation. this is maybe not needed by the application.
- virtual sa_family_t getSaFamily ()=0

  This gives the sa_family_t of the IP address. this belongs to the socket API, and will be used by the implementation of the library when creating the network socket. see also http://man7.org/linux/man-pages/man2/bind.2.html for the SaFamily.
- virtual uint8_t * getAddr ()

  get the IP address.

Protected Attributes

- uint8_t m_addr [16]

8.3.1 Detailed Description

Representation an interface of an IP address. Basically this will give you an immutable IP address interface.

Definition at line 28 of file InetAddress.h.

8.3.2 Constructor & Destructor Documentation

8.3.2.1 IInetAddress()

```
vwg::tls::IInetAddress::IInetAddress ( )  [inline]
```

Definition at line 31 of file InetAddress.h.

References m_addr.

8.3.2.2 ~IInetAddress()

```
virtual vwg::tls::IInetAddress::~IInetAddress ( )  [virtual], [default]
```

8.3.3 Member Function Documentation

8.3.3.1 getAddr()

```
virtual uint8_t * vwg::tls::IInetAddress::getAddr ( )  [inline], [virtual]
```

get the IP address.

Returns

IP address

Definition at line 88 of file InetAddress.h.

References m_addr.

8.3.3.2 getSaFamily()

```
virtual sa_family_t vwg::tls::IInetAddress::getSaFamily ( )  [pure virtual]
```

This gives the sa_family_t of the IP address. this belongs to the socket API, and will be used by the implementation of the library when creating the network socket. see also http://man7.org/linux/man-pages/man2/bind.2.html for the SaFamily.

Returns

SaFamily of the IP address.

8.3.3.3 isIPv4()

```
virtual Boolean vwg::tls::IInetAddress::isIPv4 ( )  [pure virtual]
```

Checks if this is a valid IPv6 address.

Returns

true if this is a valid IPv6 address

8.3.3.4 isIPv6()

```
virtual Boolean vwg::tls::IInetAddress::isIPv6 ( )  [pure virtual]
```

Checks if this a valid IPv6 address.

Returns

true if this is a valid IPv6 address.

8.3.3.5 isValid()

```
virtual Boolean vwg::tls::IInetAddress::isValid ( )  [pure virtual]
```

Checks if this is a valid IP address. basically this will always be true, because the factory InetAddressFactory will only return valid IInetAddress objects.

Returns

string representation of the IP address.

8.3.3.6 toString()

```
virtual std::string vwg::tls::IInetAddress::toString ( )  [pure virtual]
```

Makes a sting representation of the IP address.

Returns

string representation of the IP address

8.3.3.7 validate()

```
virtual UInt32 vwg::tls::IInetAddress::validate ( )  [pure virtual]
```

Starts the IP address validation. this is maybe not needed by the application.

Returns

an underlying error code.

8.3.4 Member Data Documentation

8.3.4.1 m_addr

```
uint8_t vwg::tls::IInetAddress::m_addr[16]  [protected]
```

Definition at line 94 of file InetAddress.h.

Referenced by getAddr(), and IInetAddress().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/InetAddress.h

8.4 vwg::tls::InetAddressFactory Class Reference

This a definition of a the factory to create instances of the IInetAddress. The supplier has to provide the implementation of the static methods by this class. Basically there is no need to create an instance of this class.

```
#include <InetAddress.h>
```

Static Public Member Functions

- static IInetAddressResult makeIPAddress (const std::string inetAddr)

  Factory method to create a valid IP IPv4 / IPv6 Address object. The given string will be validated and an IInetAddress is returned if valid.
- static IInetAddressResult makeIPAddress (const char ∗inetAdd)

  Factory method to create a valid IP IPv4 / IPv6 Address object. The given string will be validated and an IInetAddress is returned if valid.

Private Member Functions

- InetAddressFactory ()=default

8.4.1 Detailed Description

This a definition of a the factory to create instances of the IInetAddress. The supplier has to provide the implementation of the static methods by this class. Basically there is no need to create an instance of this class.

Definition at line 113 of file InetAddress.h.

8.4.2 Constructor & Destructor Documentation

8.4.2.1 InetAddressFactory()

```
vwg::tls::InetAddressFactory::InetAddressFactory ( )  [private], [default]
```

8.4.3 Member Function Documentation

8.4.3.1 makeIPAddress() [1/2]

```
static IInetAddressResult vwg::tls::InetAddressFactory::makeIPAddress (
            const char * inetAdd )  [static]
```

Factory method to create a valid IP IPv4 / IPv6 Address object. The given string will be validated and an IInetAddress is returned if valid.

Parameters

in	*inetAddr*	a string which defines a IP address. e.g "127.0.0.1"

Returns

a valid IInetAddress or an error if not valid.

8.4.3.2 makeIPAddress() [2/2]

```
static IInetAddressResult vwg::tls::InetAddressFactory::makeIPAddress (
            const std::string inetAddr )  [static]
```

Factory method to create a valid IP IPv4 / IPv6 Address object. The given string will be validated and an IInetAddress is returned if valid.

Parameters

in	*inetAddr*	a string which defines an IP address. e.g "::2" or "4:6:7...".

Returns

a valid IInetAddress or an error if not valid.

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/InetAddress.h

8.5 vwg::tls::IOStream Class Reference

Representation an interface of an I/O stream. Can read, write and close.

`#include <IOStream.h>`

Public Member Functions

- IOStream ()=default
- virtual ~IOStream ()=default
- virtual int32_t receive (void *buf, uint32_t len)=0

  Reads from the stream, up to len bytes. The method blocks until data are available, unless in non-blocking mode.
- virtual int32_t send (const void *buf, uint32_t len)=0

  Writes into the stream. The method blocks until data are sent, unless in non-blocking mode.
- virtual void close ()=0

  Closes the stream.
- virtual bool isOpen ()=0

  Check whether the stream is open or not.
- virtual bool isClosed ()=0

  Check whether the stream is open or not.

8.5.1 Detailed Description

Representation an interface of an I/O stream. Can read, write and close.

Definition at line 26 of file IOStream.h.

8.5.2 Constructor & Destructor Documentation

8.5.2.1 IOStream()

`vwg::tls::IOStream::IOStream ( )  [default]`

8.5.2.2 ~IOStream()

`virtual vwg::tls::IOStream::~IOStream ( )  [virtual], [default]`

8.5.3 Member Function Documentation

8.5.3.1 close()

```
virtual void vwg::tls::IOStream::close ( )  [pure virtual]
```

Closes the stream.

8.5.3.2 isClosed()

```
virtual bool vwg::tls::IOStream::isClosed ( )  [pure virtual]
```

Check whether the stream is open or not.

Returns

true if the stream is closed, false otherwise

8.5.3.3 isOpen()

```
virtual bool vwg::tls::IOStream::isOpen ( )  [pure virtual]
```

Check whether the stream is open or not.

Returns

true if the stream is open, false otherwise

8.5.3.4 receive()

```
virtual int32_t vwg::tls::IOStream::receive (
            void * buf,
            uint32_t len )  [pure virtual]
```

Reads from the stream, up to len bytes. The method blocks until data are available, unless in non-blocking mode.

Parameters

in	*buf*	the buffer to read into
in	*len*	length of the buffer, in bytes

Returns

the number of bytes received or the relevant StreamReturnCode error code

8.5.3.5 send()

```
virtual int32_t vwg::tls::IOStream::send (
            const void * buf,
            uint32_t len )  [pure virtual]
```

Writes into the stream. The method blocks until data are sent, unless in non-blocking mode.

Parameters

in	*buf*	the buffer to write
in	*len*	length of the buffer, in bytes

Returns

the number of bytes sent or the relevant StreamReturnCode error code

The documentation for this class was generated from the following file:

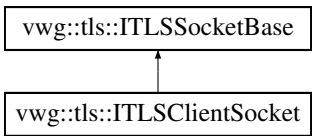
- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/IOStream.h

8.6 vwg::tls::ITLSClientSocket Class Reference

Server TLS-PSK aware client socket interface. This interface must be implemented by the supplier.

```
#include <TLSSockets.h>
```

Inheritance diagram for vwg::tls::ITLSClientSocket:



Public Member Functions

- ITLSClientSocket ()=default
- virtual ~ITLSClientSocket ()=default
- virtual TLSResult< std::shared_ptr< ITLSSessionEndpoint > > connect ()=0

  a client shall call this method in to get connected to the server. This will do all underling operations like
- virtual void setSoTimeout (Int32 timeout)=0

  Changes the default socket timeout, SO_RCVTIMEO and SO_SNDTIMEO options, according to https://linux.die.net/man/3/setsockopt.
- virtual int getSocketFD ()=0

  Gets the network socket file descriptor.

Additional Inherited Members

8.6.1 Detailed Description

Server TLS-PSK aware client socket interface. This interface must be implemented by the supplier.

For TCP based communication make a connect call to retrieve a connection to the server. The server connection is represented by a TLSSession where one can read and write the data. Within the connect call all needed operations are performed. This includes:

- make the TLS or TLS-PSK handshake (see https://tools.ietf.org/html/rfc4279).
- derive the pre shared key from the SSOA domain name.
- derive the session key from the pre shared key stored within the trust zone.

Definition at line 82 of file TLSSockets.h.

8.6.2 Constructor & Destructor Documentation

8.6.2.1 ITLSClientSocket()

```
vwg::tls::ITLSClientSocket::ITLSClientSocket ( )  [default]
```

8.6.2.2 ~ITLSClientSocket()

```
virtual vwg::tls::ITLSClientSocket::~ITLSClientSocket ( )  [virtual], [default]
```

8.6.3 Member Function Documentation

8.6.3.1 connect()

```
virtual TLSResult< std::shared_ptr< ITLSSessionEndpoint > > vwg::tls::ITLSClientSocket↩
::connect ( )  [pure virtual]
```

a client shall call this method in to get connected to the server. This will do all underling operations like

- make the TLS or TLS-PSK handshake (see https://tools.ietf.org/html/rfc4279)
- derive the pre shared key from the SSOA domain name
- derive the session key from the pre shared key stored within the trust zone.

Returns

an ITLSSessionEndpoint instance when operation was successful, otherwise an error code is delivered.

8.6.3.2 getSocketFD()

```
virtual int vwg::tls::ITLSClientSocket::getSocketFD ( )  [pure virtual]
```

Gets the network socket file descriptor.

Returns

the network socket file descriptor.

8.6.3.3 setSoTimeout()

```
virtual void vwg::tls::ITLSClientSocket::setSoTimeout (
            Int32 timeout )  [pure virtual]
```

Changes the default socket timeout, SO_RCVTIMEO and SO_SNDTIMEO options, according to https://linux.die.net/man/3/setsockopt.

Parameters

in	*timeout*	The new socket timeout value in milliseconds.

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSockets.h

8.7 vwg::tls::ITLSErrorListener Class Reference

```
#include <TLSApiTypes.h>
```

Public Member Functions

- ITLSErrorListener ()=default
- virtual ~ITLSErrorListener ()=default
- virtual void errorListener (SPIInetAddress inet, const UInt16 port, const TLSReturnCodes errorCode)=0

8.7.1 Detailed Description

Definition at line 975 of file TLSApiTypes.h.

8.7.2 Constructor & Destructor Documentation

8.7.2.1 ITLSErrorListener()

```
vwg::tls::ITLSErrorListener::ITLSErrorListener ( )  [default]
```

8.7.2.2 ~ITLSErrorListener()

```
virtual vwg::tls::ITLSErrorListener::~ITLSErrorListener ( )  [virtual], [default]
```

8.7.3 Member Function Documentation

8.7.3.1 errorListener()

```
virtual void vwg::tls::ITLSErrorListener::errorListener (
            SPIInetAddress inet,
            const UInt16 port,
            const TLSReturnCodes errorCode )  [pure virtual]
```

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.8 vwg::tls::ITLSOcspHandler Class Reference

This interface defines APIs to process and handle OCSP messages.

`#include <TLSApiTypes.h>`

Public Member Functions

- ITLSOcspHandler ()=default
- virtual ~ITLSOcspHandler ()=default
- virtual void cacheResponses (const std::vector< TLSOcspCachedResponse > &responses) noexcept=0

  Cache the OCSP responses.
- virtual std::future< std::vector< TLSOcspRequestResponse > > processRequests (const std::vector< TLSOcspRequest > &requests) noexcept=0

  Process the OCSP requests and send them to OCSP Proxy process for further processing.

8.8.1 Detailed Description

This interface defines APIs to process and handle OCSP messages.

Definition at line 709 of file TLSApiTypes.h.

8.8.2 Constructor & Destructor Documentation

8.8.2.1 ITLSOcspHandler()

```
vwg::tls::ITLSOcspHandler::ITLSOcspHandler ( )  [default]
```

8.8.2.2 ~ITLSOcspHandler()

```
virtual vwg::tls::ITLSOcspHandler::~ITLSOcspHandler ( )  [virtual], [default]
```

8.8.3 Member Function Documentation

8.8.3.1 cacheResponses()

```
virtual void vwg::tls::ITLSOcspHandler::cacheResponses (
            const std::vector< TLSOcspCachedResponse > & responses )  [pure virtual], [noexcept]
```

Cache the OCSP responses.

Note

This method shall be executed in a new thread context.

This method serialize each OCSP response, send it over to OCSP Proxy process via IPC mechanism to save it in cache. This method shall be called after:

- "processRequest" execution.
- full validation and verification of the OCSP responses.

Parameters

in	*responses*	Vector of OCSP responses to cache.

8.8.3.2 processRequests()

```
virtual std::future< std::vector< TLSOcspRequestResponse > > vwg::tls::ITLSOcspHandler↩
::processRequests (
```

```
const std::vector< TLSOcspRequest > & requests )  [pure virtual], [noexcept]
```

Process the OCSP requests and send them to OCSP Proxy process for further processing.

Note

This method shall be executed in a new thread context The returned vector shall contain an OCSP request response object FOR EACH ocsp request that was in the requests vector. In case of an error for specific OCSP request handling you shall create an OCSP request response object with the second constructor that builds object by the unique ID only. The order of the responses vector shall be the same as the order in the requests vector.

This method serialize each OCSP requests, send it over to OCSP Proxy process via IPC mechanism to decide whether to send the requests to OCSP responder or to use the responses that already cached.

Parameters

in	*requests*	Vector of OCSP requests.

Returns

A future that contains a vector of OCSP responses for each OCSP request.

The documentation for this class was generated from the following file:

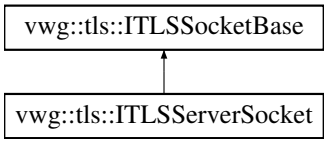
- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.9 vwg::tls::ITLSServerSocket Class Reference

Server TLS-PSK aware server socket interface. This interface must be implemented by the supplier.

`#include <TLSSockets.h>`

Inheritance diagram for vwg::tls::ITLSServerSocket:



Public Member Functions

- ITLSServerSocket ()=default
- virtual ~ITLSServerSocket ()=default
- virtual TLSSessionEndpointResult accept ()=0

  This is a blocking call for the server implementation to wait until the client will get a connection. The server may fork several thread to handle each client in an individual thread. This accept covers all needed operations like.
- virtual void setSoTimeout (Int32 timeout)=0

  Sets the socket timeout.
- virtual int getSocketFD ()=0

  Gets the network socket file descriptor.

Additional Inherited Members

8.9.1 Detailed Description

Server TLS-PSK aware server socket interface. This interface must be implemented by the supplier.

For TCP based communication make an accept call to retrieve a connection to the client. The client connection is represented by a TLSSession where one can read and write the data. Within the accept call all needed operations are performed. This includes:

- accept the network connection
- make the TLS or TLS-PSK handshake (see https://tools.ietf.org/html/rfc4279)
- derive the pre shared key from the SSOA domain name
- derive the session key from the pre shared key stored within the trust zone.

Definition at line 33 of file TLSSockets.h.

8.9.2 Constructor & Destructor Documentation

8.9.2.1 ITLSServerSocket()

```
vwg::tls::ITLSServerSocket::ITLSServerSocket ( )  [default]
```

8.9.2.2 ~ITLSServerSocket()

```
virtual vwg::tls::ITLSServerSocket::~ITLSServerSocket ( )  [virtual], [default]
```

8.9.3 Member Function Documentation

8.9.3.1 accept()

```
virtual TLSSessionEndpointResult vwg::tls::ITLSServerSocket::accept ( )  [pure virtual]
```

This is a blocking call for the server implementation to wait until the client will get a connection. The server may fork several thread to handle each client in an individual thread. This accept covers all needed operations like.

- accept the network connection
- make the TLS or TLS-PSK handshake (see https://tools.ietf.org/html/rfc4279)
- derive the pre shared key from the SSOA domain name
- derive the session key from the pre shared key stored within the trust zone.

Returns

a ITLSSessionEndpoint instance when operation was successful, otherwise an error code is delivered.

8.9.3.2 getSocketFD()

```
virtual int vwg::tls::ITLSServerSocket::getSocketFD ( )  [pure virtual]
```

Gets the network socket file descriptor.

Returns

the network socket file descriptor.

8.9.3.3 setSoTimeout()

```
virtual void vwg::tls::ITLSServerSocket::setSoTimeout (
            Int32 timeout )  [pure virtual]
```

Sets the socket timeout.

Parameters

in	*timeout*	the new socket timeout value in milliseconds.

The documentation for this class was generated from the following file:

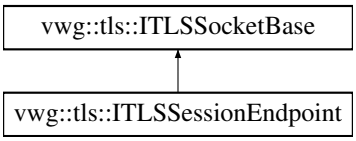
- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSockets.h

8.10 vwg::tls::ITLSSessionEndpoint Class Reference

Represents a communication session between a service provider and a service consumer. This interface must be implemented by the supplier.

```
#include <TLSSession.h>
```

Inheritance diagram for vwg::tls::ITLSSessionEndpoint:



Public Member Functions

- ITLSSessionEndpoint ()=default
- virtual ~ITLSSessionEndpoint ()=default
- virtual Int32 send (const Byte b[ ], const Int32 len)=0

  Sends a number of bytes from b[0] to b[len-1].

- virtual Int32 send (const Byte b[ ], const UInt32 offset, const Int32 len)=0

  send a number of bytes from b[0+offset] to b[len-1] starting at b at given offset.
- virtual Int32 flush ()=0

  Forces to send the bytes. Depending on the underlying socket implementation, it can happen that bytes are still within the send buffer.
- virtual Int32 available ()=0

  Checks if bytes are available. The method blocks until data are available.
- virtual Int32 receive (Byte b[ ], const Int32 len)=0

  Receive up to len bytes from stream into the buffer starting at b.
- virtual Int32 receive (Byte b[ ], const UInt32 offset, const Int32 len)=0

  Receive up to len bytes from stream into the buffer starting at b at given offset.
- virtual TLSReturnCodes setBlocking (bool blocking)=0

  Sets blocking/non-blocking mode for the session. Blocking by default.
- virtual int getSocketFD ()=0

  Gets the network socket file descriptor.
- virtual TLSReturnCodes shutdown ()=0

  Sends a "close notify" alert to the peer. The method blocks, unless in non-blocking mode.
- virtual std::string getLocalDomainName ()=0

  Gets the sSOA domain name of the session endpoint.
- virtual std::string getRemoteDomainName ()=0

  Gets the sSOA domain name of the remote session endpoint.
- virtual UInt16 getRemotePort ()=0

  Gets the port of the remote session endpoint .
- virtual SPIInetAddress getRemoteInetAddress ()=0

  Gets the inet address of the remote session endpoint .
- virtual TLSDropStatus getDropState ()=0

  Gets the current TLS drop status.
- virtual void setSessionStatusListener (TLSSessionStatusListener listener)=0

  Sets the listener function (C++-style) for status changes of the session. This overwrites the listener when already set.
- virtual void setDropStatusListener (TLSDropStatusListener listener)=0

  Sets the listener function (C++ -style) for drop changes of the session. this overwrites the listener when already set.

Additional Inherited Members

8.10.1 Detailed Description

Represents a communication session between a service provider and a service consumer. This interface must be implemented by the supplier.

Herewith one user can make send and receive data between the service provider and a service consumer The calls are basically blocking and will return until the operations is performed. This includes:

- network operations.
- Encrypting or decrypting data.

Definition at line 95 of file TLSSession.h.

8.10.2 Constructor & Destructor Documentation

8.10.2.1 ITLSSessionEndpoint()

```
vwg::tls::ITLSSessionEndpoint::ITLSSessionEndpoint ( )  [default]
```

8.10.2.2 ~ITLSSessionEndpoint()

```
virtual vwg::tls::ITLSSessionEndpoint::~ITLSSessionEndpoint ( )  [virtual], [default]
```

8.10.3 Member Function Documentation

8.10.3.1 available()

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::available ( )  [pure virtual]
```

Checks if bytes are available. The method blocks until data are available.

Returns

the number of available bytes.

8.10.3.2 flush()

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::flush ( )  [pure virtual]
```

Forces to send the bytes. Depending on the underlying socket implementation, it can happen that bytes are still within the send buffer.

Returns

0 if no error had occurred, or a negative value will indicate an error. The value 0 will indicated that the stream is closed (see TLS_EOF) Use getPendingErrors to retrieve the pending error.

8.10.3.3 getDropState()

```
virtual TLSDropStatus vwg::tls::ITLSSessionEndpoint::getDropState ( )  [pure virtual]
```

Gets the current TLS drop status.

Returns

the current TLS drop status of the connection.

8.10.3.4 getLocalDomainName()

```
virtual std::string vwg::tls::ITLSSessionEndpoint::getLocalDomainName ( )  [pure virtual]
```

Gets the sSOA domain name of the session endpoint.

Returns

the sSOA domain name of the session endpoint.

8.10.3.5 getRemoteDomainName()

```
virtual std::string vwg::tls::ITLSSessionEndpoint::getRemoteDomainName ( )  [pure virtual]
```

Gets the sSOA domain name of the remote session endpoint.

Returns

the sSOA domain name of the remote session endpoint.

8.10.3.6 getRemoteInetAddress()

```
virtual SPIInetAddress vwg::tls::ITLSSessionEndpoint::getRemoteInetAddress ( )  [pure virtual]
```

Gets the inet address of the remote session endpoint .

Returns

Gets the inet address of the remote session endpoint .

8.10.3.7 getRemotePort()

```
virtual UInt16 vwg::tls::ITLSSessionEndpoint::getRemotePort ( )  [pure virtual]
```

Gets the port of the remote session endpoint .

Returns

Gets the port of the remote session endpoint .

8.10.3.8 getSocketFD()

```
virtual int vwg::tls::ITLSSessionEndpoint::getSocketFD ( )  [pure virtual]
```

Gets the network socket file descriptor.

Returns

the network socket file descriptor.

8.10.3.9 receive() [1/2]

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::receive (
            Byte b[],
            const Int32 len )  [pure virtual]
```

Receive up to len bytes from stream into the buffer starting at b.

Note

The method blocks until data are available, unless in non-blocking mode. In case of error use getPending↩ Errors to retrieve the pending error.

Parameters

in	*b*	buffer to be set with received date.
in	*len*	buffer's length, in bytes.

Returns

the number of received bytes, or a negative value will indicate an error. The value 0 will indicated that the stream is closed (see TLS_EOF).

8.10.3.10 receive() [2/2]

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::receive (
            Byte b[],
            const UInt32 offset,
            const Int32 len ) [pure virtual]
```

Receive up to len bytes from stream into the buffer starting at b at given offset.

Note

The method blocks until data are available, unless in non-blocking mode.

Parameters

in	*b*	buffer to be set with received date.
in	*offset*	offset from beginning of the buffer to set data from it.
in	*len*	buffer's length, in bytes.

Returns

the number of number of received, or a negative value will indicate an error. The value 0 will indicated that the stream is closed (see TLS_EOF) Use getPendingErrors to retrieve the pending error.

8.10.3.11 send() [1/2]

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::send (
            const Byte b[],
            const Int32 len ) [pure virtual]
```

Sends a number of bytes from b[0] to b[len-1].

Note

The method blocks, unless in non-blocking mode. When an operation is repeated in non-blocking mode, it must be repeated with the same arguments.

Parameters

in	*b*	data buffer for sending data from it.
in	*len*	buffer's length, in bytes

Returns

the number of send bytes, or a negative value will indicate an error. The value 0 will indicated that the stream is closed (see TLS_EOF) Use getPendingErrors to retrieve the pending error.

8.10.3.12 send() [2/2]

```
virtual Int32 vwg::tls::ITLSSessionEndpoint::send (
            const Byte b[],
            const UInt32 offset,
            const Int32 len ) [pure virtual]
```

send a number of bytes from b[0+offset] to b[len-1] starting at b at given offset.

Note

The method blocks, unless in non-blocking mode. When an operation is repeated in non-blocking mode, it must be repeated with the same arguments.

Parameters

in	*b*	data buffer for sending data from it.
in	*offset*	offset from the beginning of the buffer to send data from it.
in	*len*	buffer's length, in bytes.

Returns

the number send bytes, or a negative value will indicate an error. The value 0 will indicated that the stream is closed (see TLS_EOF) Use getPendingErrors to retrieve the pending error.

8.10.3.13 setBlocking()

```
virtual TLSReturnCodes vwg::tls::ITLSSessionEndpoint::setBlocking (
            bool blocking ) [pure virtual]
```

Sets blocking/non-blocking mode for the session. Blocking by default.

Returns

success indication.

8.10.3.14 setDropStatusListener()

```
virtual void vwg::tls::ITLSSessionEndpoint::setDropStatusListener (
            TLSDropStatusListener listener ) [pure virtual]
```

Sets the listener function (C++ -style) for drop changes of the session. this overwrites the listener when already set.

8.10.3.15 setSessionStatusListener()

```
virtual void vwg::tls::ITLSSessionEndpoint::setSessionStatusListener (
            TLSSessionStatusListener listener ) [pure virtual]
```

Sets the listener function (C++-style) for status changes of the session. This overwrites the listener when already set.

Parameters

in	*listener*	listener function to be set.

8.10.3.16 shutdown()

```
virtual TLSReturnCodes vwg::tls::ITLSSessionEndpoint::shutdown ( )  [pure virtual]
```

Sends a "close notify" alert to the peer. The method blocks, unless in non-blocking mode.

Returns

success indication.

The documentation for this class was generated from the following file:

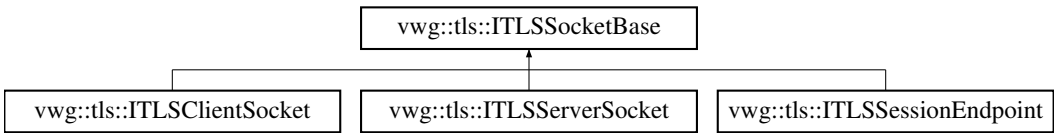
- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSession.h

8.11 vwg::tls::ITLSSocketBase Class Reference

This is an interface which defines a set of operation and features have to be available on each socket and session endpoint.

```
#include <TLSApiTypes.h>
```

Inheritance diagram for vwg::tls::ITLSSocketBase:



Public Member Functions

- ITLSSocketBase ()=default
- virtual ~ITLSSocketBase ()=default
- Boolean isDatagramSocket ()

  Gets a boolean that tells if the socket is a Datagram socket.
- virtual Boolean isConnectionSocket ()=0

  Gets a boolean that tells if the socket is a stream socket.
- virtual void close ()=0

  Closes the underlying socket connection. This will immediately close the connection, all pending data may be lost, therefore one user shall call flush before closing.
- virtual Boolean isClosed ()=0

  Checks if the endpoint/connection is closed or not.

- virtual Boolean isOpen ()=0

  Checks if the endpoint/connection is closed or not.
- virtual Boolean isErrorState ()

  Checks if the endpoint/connection is in some error state.
- virtual UInt16 getLocalPort ()=0

  Gets the port of the local session endpoint/socket.
- virtual SPIInetAddress getLocalInetAddress ()=0

  gets the inet address of the local session endpoint/socket.
- virtual Int32 getPendingErrors ()

  Reads the pending error related to the underlying socket and TLS library. One may call several times until all errors are read.
- virtual const AlpnMode & getUsedAlpnMode () const =0

  Gets the used AlpnMode.
- virtual IANAProtocol getUsedProtocol () const =0

  Gets the used INANAProtocol.

Protected Member Functions

- virtual void addPendingError (Int32 err)

  Adds a pending error to the queue.

Protected Attributes

- std::queue< Int32 > m_errors

8.11.1 Detailed Description

This is an interface which defines a set of operation and features have to be available on each socket and session endpoint.

Definition at line 989 of file TLSApiTypes.h.

8.11.2 Constructor & Destructor Documentation

8.11.2.1 ITLSSocketBase()

```
vwg::tls::ITLSSocketBase::ITLSSocketBase ( )  [default]
```

8.11.2.2 ~ITLSSocketBase()

```
virtual vwg::tls::ITLSSocketBase::~ITLSSocketBase ( )  [virtual], [default]
```

8.11.3 Member Function Documentation

8.11.3.1 addPendingError()

```
virtual void vwg::tls::ITLSSocketBase::addPendingError (
            Int32 err )  [inline], [protected], [virtual]
```

Adds a pending error to the queue.

Since

1.1.0

Definition at line 1104 of file TLSApiTypes.h.

References m_errors.

8.11.3.2 close()

```
virtual void vwg::tls::ITLSSocketBase::close ( )  [pure virtual]
```

Closes the underlying socket connection. This will immediately close the connection, all pending data may be lost, therefore one user shall call flush before closing.

8.11.3.3 getLocalInetAddress()

```
virtual SPIInetAddress vwg::tls::ITLSSocketBase::getLocalInetAddress ( )  [pure virtual]
```

gets the inet address of the local session endpoint/socket.

Returns

gets the inet address of the session endpoint/socket.

8.11.3.4 getLocalPort()

```
virtual UInt16 vwg::tls::ITLSSocketBase::getLocalPort ( )  [pure virtual]
```

Gets the port of the local session endpoint/socket.

Returns

Gets the port of the session endpoint/socket.

8.11.3.5 getPendingErrors()

```
virtual Int32 vwg::tls::ITLSSocketBase::getPendingErrors ( )  [inline], [virtual]
```

Reads the pending error related to the underlying socket and TLS library. One may call several times until all errors are read.

Returns

The pending error code (see TLSReturnCodes) or a negative value if there are no pending errors anymore.

Definition at line 1068 of file TLSApiTypes.h.

References m_errors.

8.11.3.6 getUsedAlpnMode()

```
virtual const AlpnMode & vwg::tls::ITLSSocketBase::getUsedAlpnMode ( ) const  [pure virtual]
```

Gets the used AlpnMode.

Returns

The provided ALPN mode, if no AlpnMode is specified then the const AlpnMode::ALPN_OFF is returned.

Since

1.1.0

8.11.3.7 getUsedProtocol()

```
virtual IANAProtocol vwg::tls::ITLSSocketBase::getUsedProtocol ( ) const  [pure virtual]
```

Gets the used INANAProtocol.

Returns

The used IANA protocol, In case ALPN is unused then the const IANAProtocol::NONE is returned.

Since

1.1.0

8.11.3.8 isClosed()

```
virtual Boolean vwg::tls::ITLSSocketBase::isClosed ( )  [pure virtual]
```

Checks if the endpoint/connection is closed or not.

Returns

true if endpoint/connection is closed.

8.11.3.9 isConnectionSocket()

```
virtual Boolean vwg::tls::ITLSSocketBase::isConnectionSocket ( )  [pure virtual]
```

Gets a boolean that tells if the socket is a stream socket.

Returns

true if the socket is a stream socket, otherwise false.

Referenced by isDatagramSocket().

8.11.3.10 isDatagramSocket()

```
Boolean vwg::tls::ITLSSocketBase::isDatagramSocket ( )  [inline]
```

Gets a boolean that tells if the socket is a Datagram socket.

Returns

true if the socket is a Datagram socket, otherwise false.

Definition at line 1002 of file TLSApiTypes.h.

References isConnectionSocket().

8.11.3.11 isErrorState()

```
virtual Boolean vwg::tls::ITLSSocketBase::isErrorState ( )  [inline], [virtual]
```

Checks if the endpoint/connection is in some error state.

Returns

true if endpoint/connection is in error state. One use getPendingErrors to read the errors. Depending on the error state the connection is closed already.

Definition at line 1043 of file TLSApiTypes.h.

References m_errors.

8.11.3.12 isOpen()

```
virtual Boolean vwg::tls::ITLSSocketBase::isOpen ( )  [pure virtual]
```

Checks if the endpoint/connection is closed or not.

Returns

true if endpoint/connection is closed.

8.11.4 Member Data Documentation

8.11.4.1 m_errors

```
std::queue<Int32> vwg::tls::ITLSSocketBase::m_errors  [protected]
```

Definition at line 1109 of file TLSApiTypes.h.

Referenced by addPendingError(), getPendingErrors(), and isErrorState().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.12 vwg::tls::ITLSSocketFactory Class Reference

This is the interface of the socket factory. One need to get an instance of this interface to create a server or a client socket. Use the function initTLSLib to get the instance of the factory. The implementation will have only one instance of the factory.

```
#include <TLSSocketFactory.h>
```

Public Member Functions

- ITLSSocketFactory ()=default
- virtual ~ITLSSocketFactory ()=default
- virtual ApiVersionType getApiVersion ()=0

  Gets the api version which is implemented.
- virtual TLSServerSocketResult createServerSocket (SPIInetAddress inet, const UInt16 port, const std::string localDomainName, const SecurityLevel securityLevel, const SocketType socketType=SOCKETTYPE_STREAM)=0

  Factory for creation of TLS secured server socket.
- virtual TLSSessionEndpointResult createPskServerSession (int connectionFd, const std::string local↩ DomainName, const SecurityLevel confidentiality)=0

  Factory for creation of TLS secured server socket.
- virtual TLSServerSocketResult createServerSocket (int fd, const std::string localDomainName, const SecurityLevel confidentiality)=0

Factory for creation of TLS secured server socket.

- virtual TLSClientSocketResult createClientSocket (SPIInetAddress inet, const UInt16 port, const std::string localDomainName, const SecurityLevel confidentiality, const SocketType socketType=SOCKETTYPE_STREAM)=0

  Factory for creation of TLS secured client socket.

- virtual TLSClientSocketResult createClientSocket (int fd, const std::string localDomainName, const SecurityLevel confidentiality)=0

  Factory for creation of TLS secured client socket.

- virtual TLSClientSocketResult createTlsClient (const std::shared_ptr< IOStream > stream, const std::string &hostName, const CertStoreID &certStoreId, const ClientCertificateSetID &clientCertificateSetID, const CipherSuiteIds &cipherSuiteIds, const TimeCheckTime &checkTime, const std::vector< HashSha256 > &httpPublicKeyPinningHashs, const bool revocationCheckEnabled=false)=0

  factory for creation of TLS secured client end point on top of a given socket using certificates, using a stream instead of a socket.

- virtual TLSClientSocketResult createTlsClient (const TLSConnectionSettings &connectionSettings, const std::shared_ptr< IOStream > stream, const std::string &hostName, const CertStoreID &certStoreId, const ClientCertificateSetID &clientCertificateSetID, const TimeCheckTime &checkTime, const std::vector< HashSha256 > &httpPublicKeyPinningHashs, const bool revocationCheckEnabled=false) noexcept=0

  Factory for creation of TLS secured client end point on top of a given socket using certificates, using a stream instead of a socket.

8.12.1 Detailed Description

This is the interface of the socket factory. One need to get an instance of this interface to create a server or a client socket. Use the function initTLSLib to get the instance of the factory. The implementation will have only one instance of the factory.

Definition at line 35 of file TLSSocketFactory.h.

8.12.2 Constructor & Destructor Documentation

8.12.2.1 ITLSSocketFactory()

```
vwg::tls::ITLSSocketFactory::ITLSSocketFactory ( )  [default]
```

8.12.2.2 ~ITLSSocketFactory()

```
virtual vwg::tls::ITLSSocketFactory::~ITLSSocketFactory ( )  [virtual], [default]
```

8.12.3 Member Function Documentation

8.12.3.1 createClientSocket() [1/2]

```
virtual TLSClientSocketResult vwg::tls::ITLSSocketFactory::createClientSocket (
            int fd,
            const std::string localDomainName,
            const SecurityLevel confidentiality )  [pure virtual]
```

Factory for creation of TLS secured client socket.

This factory method will create underlying server socket and will use an SSL library. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

The PSK Key Mapping must be also defined as an external dependency.

Parameters

in	*fd*	the fd of the socket. Must be connected before creating. responsibilty is solely by the user of the api.
in	*localDomainName*	the SSOA defined domain name. Depending on the domain name the PSK key have to be used. (see Secure service communication Secure service-oriented architecture (sSOA) Technische Entwicklung, Querschnittslastenheft: LAH.000.036).
in	*confidentiality*	the SSOA confidentiality (see Secure service communication LHA) This call will accept only the security levels AUTHENTIC_WITHPSK or CONFIDENTIAL_WITHPSK.

Returns

TLSClientSocketResult with socket or an error code the expected error code: can be

- RC_TLS_SUCCESSFUL
- RC_TLS_INIT_FAILED
- RC_TLS_CONNECT_FAILED
- RC_TLS_IO_ERROR
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER

- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION

8.12.3.2 createClientSocket() [2/2]

```
virtual TLSClientSocketResult vwg::tls::ITLSSocketFactory::createClientSocket (
            SPIInetAddress inet,
            const UInt16 port,
            const std::string localDomainName,
            const SecurityLevel confidentiality,
            const SocketType socketType = SOCKETTYPE_STREAM )  [pure virtual]
```

Factory for creation of TLS secured client socket.

This factory method will create underlying server socket and will use an SSL library. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

The PSK Key Mapping must be also defined as an external dependency.

Parameters

in	*inet*	the given Inet address for the server to connect.
in	*port*	the port number of the socket.
in	*localDomainName*	the SSOA defined domain name. Depending on the domain name the PSK key have to be used. (see Secure service communication Secure service-oriented architecture (sSOA) Technische Entwicklung, Querschnittslastenheft: LAH.000.036).
in	*confidentiality*	the SSOA confidentiality (see Secure service communication LHA) This call will accept only the security levels AUTHENTIC_WITHPSK or CONFIDENTIAL_WITHPSK.

Returns

TLSClientSocketResult with socket or an error code, the expected error code can be:

- RC_TLS_SUCCESSFUL

- RC_TLS_INIT_FAILED
- RC_TLS_CONNECT_FAILED
- RC_TLS_IO_ERROR
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION
- RC_TLS_INVALID_IP

8.12.3.3 createPskServerSession()

```
virtual TLSSessionEndpointResult vwg::tls::ITLSSocketFactory::createPskServerSession (
            int connectionFd,
            const std::string localDomainName,
            const SecurityLevel confidentiality )  [pure virtual]
```

Factory for creation of TLS secured server socket.

This factory method will create underlying server socket and will use a SSL library. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

The PSK Key Mapping must be also defined as an external dependency.

Parameters

in	*connectionFd*	the FD is an already open and accepted connection.
in	*localDomainName*	the SSOA defined domain name. Depending on the domain name the PSK key have to be used. (see Secure service communication Secure service-oriented
in	*confidentiality*	architecture (sSOA) Technische Entwicklung, Querschnittslastenheft: LAH.000.036). the SSOA confidentiality (see Secure service communication LHA). This call will accept only the security levels AUTHENTIC_WITHPSK, CONFIDENTIAL_WITHPSK

Returns

TLSSessionEndpointResult with socket after handshake or error code the expected error code can be:

- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_IO_ERROR
- RC_TLS_SUCCESSFUL
- RC_TLS_INIT_FAILED
- RC_TLS_PROGRAMMING_ERROR_RESULT
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_PEER_CLOSED
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION

8.12.3.4 createServerSocket() [1/2]

```
virtual TLSServerSocketResult vwg::tls::ITLSSocketFactory::createServerSocket (
            int fd,
            const std::string localDomainName,
            const SecurityLevel confidentiality )  [pure virtual]
```

Factory for creation of TLS secured server socket.

This factory method will create underlying server socket and will use a SSL library. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

The PSK Key Mapping must be also defined as an external dependency

Parameters

in	*fd*	the fd of the socket. Responsibility is solely by the user of the api, the lib assumes the fd is already initiated.
in	*localDomainName*	the SSOA defined domain name. Depending on the domain name the PSK key have to be used. (see Secure service communication Secure service-oriented architecture (sSOA) Technische Entwicklung, Querschnittslastenheft: LAH.000.036).
in	*confidentiality*	the SSOA confidentiality (see Secure service communication LHA). This call will accept only the security levels AUTHENTIC_WITHPSK, CONFIDENTIAL_WITHPSK.

Returns

TLSServerSocketResult with socket or error code the expected error code can be :

- RC_TLS_SUCCESSFUL
- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_INIT_FAILED
- RC_TLS_IO_ERROR
- RC_TLS_PROGRAMMING_ERROR_RESULT
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_PEER_CLOSED
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION

8.12.3.5 createServerSocket() [2/2]

```
virtual TLSServerSocketResult vwg::tls::ITLSSocketFactory::createServerSocket (
            SPIInetAddress inet,
            const UInt16 port,
            const std::string localDomainName,
            const SecurityLevel securityLevel,
            const SocketType socketType = SOCKETTYPE_STREAM )  [pure virtual]
```

Factory for creation of TLS secured server socket.

This factory method will create underlying server socket and will use a SSL library. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

The PSK Key Mapping must be also defined as an external dependency.

Parameters

in	*inet*	the given Inet address for the socket, where the server network socket is opened. see http://man7.org/linux/man-pages/man2/socket.2.html keep in mind the a system can have more than one inet address, therefore one need to provide the IP address.
in	*port*	the port number of the socket.
in	*localDomainName*	the SSOA defined domain name. Depending on the domain name the PSK key have to be used. (see Secure service communication Secure service-oriented architecture (sSOA) Technische Entwicklung, Querschnittslastenheft: LAH.000.036).
in	*securityLevel*	the SSOA confidentiality (see Secure service communication LHA). This call will accept only the security levels AUTHENTIC_WITHPSK, CONFIDENTIAL_WITHPSK.
in	*socketType*	defines the socket to be stream socket (TCP).

Returns

TLSServerSocketResult with socket or error code, the expected error code can be:

- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_IO_ERROR
- RC_TLS_SUCCESSFUL
- RC_TLS_INIT_FAILED
- RC_TLS_PROGRAMMING_ERROR_RESULT
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_PEER_CLOSED

- RC_TLS_INVALID_IP
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION

8.12.3.6 createTlsClient() [1/2]

```
virtual TLSClientSocketResult vwg::tls::ITLSSocketFactory::createTlsClient (
            const std::shared_ptr< IOStream > stream,
            const std::string & hostName,
            const CertStoreID & certStoreId,
            const ClientCertificateSetID & clientCertificateSetID,
            const CipherSuiteIds & cipherSuiteIds,
            const TimeCheckTime & checkTime,
            const std::vector< HashSha256 > & httpPublicKeyPinningHashs,
            const bool revocationCheckEnabled = false )  [pure virtual]
```

factory for creation of TLS secured client end point on top of a given socket using certificates, using a stream instead of a socket.

This connection will use the common TLS certificate based handshake according to the RFC 5246 for mutual authorization (https://www.ietf.org/rfc/rfc5246.txt). this factory method will a session endpoint on top of a given OS client socket (see http://pubs.opengroup.org/onlinepubs/7908799/xns/socket.html). It assumes the the socket is already bounded and accepted, by the user of the method. In general it is within the method user responsibility to manage the socket. Especially it is important the the method user will not manipulate the socket in parallel nor call the creatTlsClientEndpoint multiple times on the same socket. Any derivation may cause unexpected behavior. The method will try to make the TLS handshake on the given connection, which may fail to the undefined state of the socket connection. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are: a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

Security aspects.

1. The TLS connect will be always use "Service Name Indication". The "Service Name Indication" will be implemented according to **RFC 6066** (see https://tools.ietf.org/html/rfc6066). The "Service Name Indication" check will using the given domain name, which have to to be compliant to **RFC 5890**.
2. Certficates....

Parameters

in	*stream*	this is stream implementation playing the role of the socket where the encrypted data are written to or read from. The stream must be connected before the creating. If a multi-threaded system is used, make sure that the stream implementation includes a timeout value in the send and receive operations, without compromising the server's ability to listen and accept overtime.
in	*hostName*	: a) use the name to ensure the backend server will be authentic (server ID verification) b) this must be valid host(domain) name for performing "Service Name Indication" (SNI) (see also ps://de.wikipedia.org/wiki/Server_Name_Indication) the domainName must not be empty, it is mandatory to perform the "Service Name Indication" and "server ID verification" in any case.
in	*certStoreId*	the ID of the certificate store. This certificate store shall be located in the trust zone and contain all relevant certificates. predefined "VMKS": for VKMS Root Certificate(s), other for Trust Stores as contained in VI Trust Store Container
in	*clientCertificateSetID*	this defines the usage of the client key. This will define the if the key is used, if yes the location where the key is located and the key ID within the store.
in	*cipherSuiteIds*	A vector containing the list of supported cipher suites (ciphers defined in TLS- QLAH). If vector is empty (or contain only invalid options), default cipher pre defined use case will be used (TLSCipherSuiteUseCasesSettings::CSUSDefault use case).
in	*checkTime*	do the time check in addition to the certificate validity check. This check will verify if the certificate check time. This check can be omitted, by using null for this parameter.
in	*httpPublicKeyPinningHashs*	this is optional to support the HTTP Public Key pinning according to RFC 7469 (see https://tools.ietf.org/html/rfc7469 for the RFC and https://en.wikipedia.org/wiki/HTTP_↩ Public_Key_Pinning for more details). basically this means at least one pin value must match any certificate in the full certificate chain.
in	*revocationCheckEnabled*	this is optional if set OCSP will be used.

Returns

TLSClientSocketResult with socket or error code the expected error code can be:

- RC_TLS_SUCCESSFUL
- RC_TLS_INIT_FAILED
- RC_TLS_CONNECT_FAILED
- RC_TLS_IO_ERROR
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_BAD_RECORD_MAC

- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION
- RC_TLS_PEER_CLOSED
- RC_TLS_SEND_AFTER_SHUTDOWN
- RC_TLS_PUBLIC_KEY_PINNING_FAILED
- RC_TLS_BAD_CERTIFICATE
- RC_TLS_UNSUPPORTED_CERTIFICATE
- RC_TLS_CERTIFICATE_REVOKED
- RC_TLS_CERTIFICATE_EXPIRE
- RC_TLS_CERTIFICATE_UNKNOWN
- RC_TLS_UNKNOWN_CA

Deprecated this method becomes deprecated since 1.1.0, please use method with ALPN support.

8.12.3.7 createTlsClient() [2/2]

```
virtual TLSClientSocketResult vwg::tls::ITLSSocketFactory::createTlsClient (
            const TLSConnectionSettings & connectionSettings,
            const std::shared_ptr< IOStream > stream,
            const std::string & hostName,
            const CertStoreID & certStoreId,
            const ClientCertificateSetID & clientCertificateSetID,
            const TimeCheckTime & checkTime,
            const std::vector< HashSha256 > & httpPublicKeyPinningHashs,
            const bool revocationCheckEnabled = false )  [pure virtual], [noexcept]
```

Factory for creation of TLS secured client end point on top of a given socket using certificates, using a stream instead of a socket.

This connection will use the common TLS certificate based handshake according to the RFC 5246 for mutual authorization (https://www.ietf.org/rfc/rfc5246.txt). this factory method

will a session endpoint on top of a given OS client socket (see http://pubs.opengroup.org/onlinepubs/7908799/xns/socket.html). It assumes the socket is already bounded and accepted, by the user of the method. In general it is within the method user responsibility to manage the socket. Especially it is important the method user will not manipulate the socket in parallel nor call the creatTlsClientEndpoint multiple times on the same socket. Any derivation may cause unexpected behavior. The method will try to make the TLS handshake on the given connection, which may fail to the undefined state of the socket connection. In contrast to the EB/Conti solution the network socket is created by the TLSSocket and the confidentiality is a mandatory parameter. The reasons for this are a) to be independent, form the manifest management. So this api can also be used for certificate based TLS connections, which will not have an security manifest (see CE Device Support). b) in case of port multiplexing in conjunction with IP routing this can be difficult to calculate the confidentiality correct. Therefore it may be a useful method to have the method getConfidentality4Port as a separated function.

Security aspects.

1. The TLS connect will be always use "Service Name Indication". The "Service Name Indication" will be implemented according to **RFC 6066** (see https://tools.ietf.org/html/rfc6066) The "Service Name Indication" check will using the given domain name, which have to to be compliant to **RFC 5890**.
2. Certificates....

Parameters

in	*connectionSettings*	This basic setting is used to define the ALPN mode and the set of cipher suite used. There is a set of predefined setting which can be used.
in	*stream*	this is stream implementation playing the role of the socket where the encrypted data are written to or read from. The stream must be connected before the creating. If a multi-threaded system is used, make sure that the stream implementation includes a timeout value in the send and receive operations, without compromising the server's ability to listen and accept overtime.
in	*hostName*	a) use the name to ensure the backend server will be authentic (server ID verification). b) this must be valid host(domain) name for performing "Service Name Indication" (SNI) (see also ps://de.wikipedia.org/wiki/Server_Name_Indication) domainName must not be empty, it is mandatory to perform the "Service Name Indication" and "server ID verification" in any case.
in	*certStoreId*	the ID of the certificate store. This certificate store shall be located in the trust zone and contain all relevant certificates. predefined "VMKS": for VKMS Root Certificate(s), other for Trust Stores as contained in VI Trust Store Container.
in	*clientCertificateSetID*	this defines the usage of the client key. This will define the if the key is used, if yes the location where the key is located and the key ID within the store.
in	*checkTime*	do the time check in addition to the certificate validity check. This check will verify if the certificate check time. This check can be omitted, by using null for this parameter.
in	*httpPublicKeyPinningHashs*	this is an optional to support the HTTP Public Key pinning according to RFC 7469 (see https://tools.ietf.org/html/rfc7469 for the RFC and https://en.wikipedia.org/wiki/HTTP_Public_Key_Pinning for more details). basically this means at least one pin value must match any certificate in the full certificate chain.
in	*revocationCheckEnabled*	this is optional if set OCSP will be used.

Returns

TLSClientSocketResult with socket or an error code, the expected error code can be:

- RC_TLS_SUCCESSFUL
- RC_TLS_INIT_FAILED
- RC_TLS_CONNECT_FAILED
- RC_TLS_IO_ERROR
- RC_TLS_WOULD_BLOCK_READ
- RC_TLS_WOULD_BLOCK_WRITE
- RC_TLS_UNEXPECTED_MESSAGE
- RC_TLS_BAD_RECORD_MAC
- RC_TLS_RECORD_OVERFLOW
- RC_TLS_DECOMPRESSION_FAILURE
- RC_TLS_HANDSHAKE_FAILURE
- RC_TLS_ILLEGAL_PARAMETER
- RC_TLS_ACCESS_DENIED
- RC_TLS_DECODE_ERROR
- RC_TLS_DECRYPT_ERROR
- RC_TLS_PROTOCOL_VERSION
- RC_TLS_INSUFFICIENT_SECURITY
- RC_TLS_NO_RENEGOTIATION
- RC_TLS_UNSUPPORTED_EXTENSION
- RC_TLS_PEER_CLOSED
- RC_TLS_SEND_AFTER_SHUTDOWN
- RC_TLS_PUBLIC_KEY_PINNING_FAILED
- RC_TLS_BAD_CERTIFICATE
- RC_TLS_UNSUPPORTED_CERTIFICATE
- RC_TLS_CERTIFICATE_REVOKED
- RC_TLS_CERTIFICATE_EXPIRE
- RC_TLS_CERTIFICATE_UNKNOWN
- RC_TLS_NO_APPLICATION_PROTOCOL
- RC_TLS_UNKNOWN_CA

Since

1.1.0

8.12.3.8 getApiVersion()

```
virtual ApiVersionType vwg::tls::ITLSSocketFactory::getApiVersion ( )  [pure virtual]
```

Gets the api version which is implemented.

Returns

the API Version.

Since

1.1.0

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSocketFactory.h

8.13 vwg::tls::TimeCheckTime Struct Reference

This is a structure that will be used to pass the authentic time. basically this time will be compared with the system time, as shown below.

```
#include <TLSApiTypes.h>
```

Public Attributes

- std::time_t expectedTime

  This is expected time to be compared with the system time. please keep in mind that the expected time can be either the authentic time provided by the authentic time service oder the UTC provided by the time service. The time service must be used because the system time is currently not defined and only the ICAS1 will have a RTC.
- int permittedDeviation

  A permitted deviation shall be given in seconds.

8.13.1 Detailed Description

This is a structure that will be used to pass the authentic time. basically this time will be compared with the system time, as shown below.

|expectedTime - system_time.now() | <= |permittedDeviation|

If the difference of the |expectedTime - system_time.now() | is in the range of the |permittedDeviation| then the handshake will regarded as legal. The permittedDeviation shall be less than one day (86400sec), if the permitted↩ Deviation is above this it will be used MAX_PERMITTED_DEVIATION if the expectedTime is 0, then time check is not required.

Definition at line 98 of file TLSApiTypes.h.

8.13.2 Member Data Documentation

8.13.2.1 expectedTime

```
std::time_t vwg::tls::TimeCheckTime::expectedTime
```

This is expected time to be compared with the system time. please keep in mind that the expected time can be either the authentic time provided by the authentic time service oder the UTC provided by the time service. The time service must be used because the system time is currently not defined and only the ICAS1 will have a RTC.

Definition at line 105 of file TLSApiTypes.h.

8.13.2.2 permittedDeviation

```
int vwg::tls::TimeCheckTime::permittedDeviation
```

A permitted deviation shall be given in seconds.

Definition at line 110 of file TLSApiTypes.h.

The documentation for this struct was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.14 vwg::tls::TLSConnectionSettings Class Reference

this class is used to define the TLS connection properties for a backend TLS connection. This class contains a set of configuration properties for the TLS connection.

```
#include <TLSApiTypes.h>
```

Public Member Functions

- TLSConnectionSettings (const AlpnMode &alpnMode, TLSCipherSuiteUseCasesSettings cipherSuite↩ Settings=TLSCipherSuiteUseCasesSettings::CSUSDefault, const std::string &connectionLoggingName="")

  Constructor.
- TLSConnectionSettings (const AlpnMode &alpnMode, std::shared_ptr< ITLSOcspHandler > ocspHandler, const UInt32 ocspTimeoutMs=DEFAULT_OCSP_ONLINE_TIMEOUT_MS, TLSCipherSuiteUseCasesSettings cipherSuiteSettings=TLSCipherSuiteUseCasesSettings::CSUSDefault, const std::string &connection↩ LoggingName="")

  Constructor.
- TLSConnectionSettings (const AlpnMode &alpnMode, const std::string &cipherSuiteSettings, const std::string &connectionLoggingName="")

  Creates a TLSConnectionSettings data config object to parametrize the TLS session.
- ~TLSConnectionSettings ()=default
- const TLSCipherSuiteUseCasesSettings & getCipherSuiteUseCasesSettings () const

  Gets the cipher suite use case settings.
- const AlpnMode & getAlpnMode () const

  Gets the ALPN mode.
- const std::shared_ptr< ITLSOcspHandler > & getOcspHandler () const

  Gets the OCSP handler.
- const UInt32 & getOcspTimeoutMs () const

  Gets the OCSP timeout in milliseconds.
- std::string getConnectionLoggingName () const

  get the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Private Attributes

- const AlpnMode m_alpnMode
- std::shared_ptr< ITLSOcspHandler > m_ocspHandler
- const UInt32 m_ocspTimeoutMs
- TLSCipherSuiteUseCasesSettings m_cipherSuiteSettings
- std::string m_connectionLoggingName

8.14.1 Detailed Description

this class is used to define the TLS connection properties for a backend TLS connection. This class contains a set of configuration properties for the TLS connection.

alpnMode
The given ALPN Mode, set detail for ALPN mode at the according class

cipherSuiteSettings
Supported cipher suite set (https://devstack.vwgroup.com/jira/browse/IMAN-46128) the parameter is given as a string, so it give maximal portability. If the given sting is not valid the default set is used.

ocspHandler

ocspTimeoutMs

connectionLoggingName
the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Since

1.2.0

Since

1.1.0

Definition at line 785 of file TLSApiTypes.h.

8.14.2 Constructor & Destructor Documentation

8.14.2.1 TLSConnectionSettings() [1/3]

```
vwg::tls::TLSConnectionSettings::TLSConnectionSettings (
            const AlpnMode & alpnMode,
            TLSCipherSuiteUseCasesSettings cipherSuiteSettings = TLSCipherSuiteUseCasesSettings↩
::CSUSDefault,
            const std::string & connectionLoggingName = "" )  [inline]
```

Constructor.

Parameters

in	*alpnMode*	The given ALPN Mode.
in	*cipherSuiteSettings*	Supported cipher suite set (https://devstack.vwgroup.↩ com/jira/browse/IMAN-46128).
in	*connectionLoggingName*	the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Definition at line 799 of file TLSApiTypes.h.

8.14.2.2 TLSConnectionSettings() [2/3]

```
vwg::tls::TLSConnectionSettings::TLSConnectionSettings (
            const AlpnMode & alpnMode,
            std::shared_ptr< ITLSOcspHandler > ocspHandler,
            const UInt32 ocspTimeoutMs = DEFAULT_OCSP_ONLINE_TIMEOUT_MS,
            TLSCipherSuiteUseCasesSettings cipherSuiteSettings = TLSCipherSuiteUseCasesSettings↩
::CSUSDefault,
            const std::string & connectionLoggingName = "" )  [inline]
```

Constructor.

Parameters

in	*alpnMode*	The given ALPN Mode.
in	*ocspHandler*	OCSP handler.
in	*ocspTimeoutMs*	OCSP timeout in milliseconds.
in	*cipherSuiteSettings*	Supported cipher suite set (https://devstack.vwgroup.↩ com/jira/browse/IMAN-46128).
in	*connectionLoggingName*	the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Definition at line 823 of file TLSApiTypes.h.

8.14.2.3 TLSConnectionSettings() [3/3]

```
vwg::tls::TLSConnectionSettings::TLSConnectionSettings (
            const AlpnMode & alpnMode,
            const std::string & cipherSuiteSettings,
            const std::string & connectionLoggingName = "" )  [inline]
```

Creates a TLSConnectionSettings data config object to parametrize the TLS session.

Parameters

in	*alpnMode*	The given ALPN Mode.
in	*cipherSuiteSettings*	Supported cipher suite set (https://devstack.vwgroup.↩ com/jira/browse/IMAN-46128) the parameter is given as a string, so it give maximal portability. If the given string is invalid then the default set is used.
in	*connectionLoggingName*	the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Since

1.1.0

Definition at line 851 of file TLSApiTypes.h.

References vwg::tls::CSUSDefaultWithSoftFail, vwg::tls::CSUSDefaulWithSoftFailtStr, vwg::tls::CSUSIanaRecommended, vwg::tls::CSUSIanaRecommendedStr, vwg::tls::CSUSLegacy, vwg::tls::CSUSLegacyStr, vwg::tls::CSUSLongtermSecure, vwg::tls::CSUSLongtermSecureStr, and m_cipherSuiteSettings.

8.14.2.4 ~TLSConnectionSettings()

```
vwg::tls::TLSConnectionSettings::~TLSConnectionSettings ( )  [default]
```

8.14.3 Member Function Documentation

8.14.3.1 getAlpnMode()

```
const AlpnMode & vwg::tls::TLSConnectionSettings::getAlpnMode ( ) const  [inline]
```

Gets the ALPN mode.

Returns

The ALPN mode.

Definition at line 893 of file TLSApiTypes.h.

References m_alpnMode.

8.14.3.2 getCipherSuiteUseCasesSettings()

```
const TLSCipherSuiteUseCasesSettings & vwg::tls::TLSConnectionSettings::getCipherSuiteUse↩
CasesSettings ( ) const  [inline]
```

Gets the cipher suite use case settings.

Returns

The cipher suite use case settings.

Definition at line 882 of file TLSApiTypes.h.

References m_cipherSuiteSettings.

8.14.3.3 getConnectionLoggingName()

```
std::string vwg::tls::TLSConnectionSettings::getConnectionLoggingName ( ) const  [inline]
```

get the ConnectionLoggingName This is a optional name to identify the connection for logging reasons. This name shall be provided by the user of the TLS library to identify the connection in logging

Returns

Tthe ConnectionLoggingName

Since

1.2.0

Definition at line 927 of file TLSApiTypes.h.

References m_connectionLoggingName.

8.14.3.4 getOcspHandler()

```
const std::shared_ptr< ITLSOcspHandler > & vwg::tls::TLSConnectionSettings::getOcspHandler ( )
const  [inline]
```

Gets the OCSP handler.

Returns

The OCSP handler.

Definition at line 904 of file TLSApiTypes.h.

References m_ocspHandler.

8.14.3.5 getOcspTimeoutMs()

```
const UInt32 & vwg::tls::TLSConnectionSettings::getOcspTimeoutMs ( ) const  [inline]
```

Gets the OCSP timeout in milliseconds.

Returns

The OCSP handler.

Definition at line 915 of file TLSApiTypes.h.

References m_ocspTimeoutMs.

8.14.4 Member Data Documentation

8.14.4.1 m_alpnMode

```
const AlpnMode vwg::tls::TLSConnectionSettings::m_alpnMode  [private]
```

Definition at line 934 of file TLSApiTypes.h.

Referenced by getAlpnMode().

8.14.4.2 m_cipherSuiteSettings

```
TLSCipherSuiteUseCasesSettings vwg::tls::TLSConnectionSettings::m_cipherSuiteSettings  [private]
```

Definition at line 937 of file TLSApiTypes.h.

Referenced by getCipherSuiteUseCasesSettings(), and TLSConnectionSettings().

8.14.4.3 m_connectionLoggingName

```
std::string vwg::tls::TLSConnectionSettings::m_connectionLoggingName  [private]
```

Definition at line 938 of file TLSApiTypes.h.

Referenced by getConnectionLoggingName().

8.14.4.4 m_ocspHandler

```
std::shared_ptr<ITLSOcspHandler> vwg::tls::TLSConnectionSettings::m_ocspHandler  [private]
```

Definition at line 935 of file TLSApiTypes.h.

Referenced by getOcspHandler().

8.14.4.5 m_ocspTimeoutMs

```
const UInt32 vwg::tls::TLSConnectionSettings::m_ocspTimeoutMs  [private]
```

Definition at line 936 of file TLSApiTypes.h.

Referenced by getOcspTimeoutMs().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.15 vwg::tls::TLSOcspCachedResponse Class Reference

This class represents a cached OCSP response message.

```
#include <TLSApiTypes.h>
```

Public Member Functions

- TLSOcspCachedResponse (const std::vector< UInt8 > &response, const UInt64 requestUniqueId, const std::string &producedAtDate, const std::string &nextUpdateDate, const std::string &thisUpdateDate)

  Constructor.
- TLSOcspCachedResponse (TLSOcspCachedResponse &&)=default
- TLSOcspCachedResponse (const TLSOcspCachedResponse &)=default
- TLSOcspCachedResponse & operator= (const TLSOcspCachedResponse &)=default
- TLSOcspCachedResponse & operator= (TLSOcspCachedResponse &&)=default
- ~TLSOcspCachedResponse ()=default
- const std::vector< UInt8 > & getResponse () const noexcept

  Gets the OCSP response message.
- UInt64 getRequestUniqueId () const noexcept

  Gets the unique ID of the related OCSP request for this OCSP response.
- const std::string & getProducedAt () const noexcept

  Gets producedAt date parameter from the response.
- const std::string & getNextUpdate () const noexcept

  Gets nextUpdate date parameter from the response.
- const std::string & getThisUpdate () const noexcept

  Gets thisUpdate date parameter from the response.

Private Attributes

- std::vector< UInt8 > m_response
- UInt64 m_requestUniqueId
- std::string m_producedAt
- std::string m_nextUpdate
- std::string m_thisUpdate

8.15.1 Detailed Description

This class represents a cached OCSP response message.

Definition at line 600 of file TLSApiTypes.h.

8.15.2 Constructor & Destructor Documentation

8.15.2.1 TLSOcspCachedResponse() [1/3]

```
vwg::tls::TLSOcspCachedResponse::TLSOcspCachedResponse (
            const std::vector< UInt8 > & response,
            const UInt64 requestUniqueId,
            const std::string & producedAtDate,
            const std::string & nextUpdateDate,
            const std::string & thisUpdateDate )  [inline]
```

Constructor.

Note

all dates are expressed according to ISO8601 in UTC - YYYYMMDDHHMMSSZ.

Parameters

in	*response*	Vector of bytes that contains raw OCSP response message encoded in BER format.
in	*requestUniqueId*	Unique ID of the related OCSP request for this OCSP response.
in	*producedAtDate*	The time at which the OCSP responder signed this OCSP response.
in	*nextUpdateDate*	The time at or before which newer information will be available about the status of the certificate.
in	*thisUpdateDate*	The most recent time at which the status being indicated is known by the OCSP responder to have been correct.

Definition at line 616 of file TLSApiTypes.h.

8.15.2.2 TLSOcspCachedResponse() [2/3]

```
vwg::tls::TLSOcspCachedResponse::TLSOcspCachedResponse (
            TLSOcspCachedResponse && )  [default]
```

8.15.2.3 TLSOcspCachedResponse() [3/3]

```
vwg::tls::TLSOcspCachedResponse::TLSOcspCachedResponse (
            const TLSOcspCachedResponse &  )  [default]
```

8.15.2.4 ~TLSOcspCachedResponse()

```
vwg::tls::TLSOcspCachedResponse::~TLSOcspCachedResponse ( )  [default]
```

8.15.3 Member Function Documentation

8.15.3.1 getNextUpdate()

```
const std::string & vwg::tls::TLSOcspCachedResponse::getNextUpdate ( ) const  [inline], [noexcept]
```

Gets nextUpdate date parameter from the response.

Note

Date is expressed according to ISO8601 in UTC - YYYYMMDDHHMMSSZ.

Returns

String which contains the date in ISO8601 format.

Definition at line 680 of file TLSApiTypes.h.

References m_nextUpdate.

8.15.3.2 getProducedAt()

```
const std::string & vwg::tls::TLSOcspCachedResponse::getProducedAt ( ) const  [inline], [noexcept]
```

Gets producedAt date parameter from the response.

Note

Date is expressed according to ISO8601 in UTC - YYYYMMDDHHMMSSZ.

Returns

String which contains the date in ISO8601 format.

Definition at line 667 of file TLSApiTypes.h.

References m_producedAt.

8.15.3.3 getRequestUniqueId()

```
UInt64 vwg::tls::TLSOcspCachedResponse::getRequestUniqueId ( ) const  [inline], [noexcept]
```

Gets the unique ID of the related OCSP request for this OCSP response.

Returns

OCSP request message unique ID.

Definition at line 654 of file TLSApiTypes.h.

References m_requestUniqueId.

8.15.3.4 getResponse()

```
const std::vector< UInt8 > & vwg::tls::TLSOcspCachedResponse::getResponse ( ) const  [inline],
[noexcept]
```

Gets the OCSP response message.

Returns

Vector of bytes that contains the response in BER encoding.

Definition at line 643 of file TLSApiTypes.h.

References m_response.

8.15.3.5 getThisUpdate()

```
const std::string & vwg::tls::TLSOcspCachedResponse::getThisUpdate ( ) const  [inline], [noexcept]
```

Gets thisUpdate date parameter from the response.

Note

Date is expressed according to ISO8601 in UTC - YYYYMMDDHHMMSSZ.

Returns

String which contains the date in ISO8601 format.

Definition at line 693 of file TLSApiTypes.h.

References m_thisUpdate.

8.15.3.6 operator=() [1/2]

```
TLSOcspCachedResponse & vwg::tls::TLSOcspCachedResponse::operator= (
            const TLSOcspCachedResponse &  )  [default]
```

8.15.3.7 operator=() [2/2]

```
TLSOcspCachedResponse & vwg::tls::TLSOcspCachedResponse::operator= (
            TLSOcspCachedResponse &&  )  [default]
```

8.15.4 Member Data Documentation

8.15.4.1 m_nextUpdate

```
std::string vwg::tls::TLSOcspCachedResponse::m_nextUpdate  [private]
```

Definition at line 702 of file TLSApiTypes.h.

Referenced by getNextUpdate().

8.15.4.2 m_producedAt

```
std::string vwg::tls::TLSOcspCachedResponse::m_producedAt  [private]
```

Definition at line 701 of file TLSApiTypes.h.

Referenced by getProducedAt().

8.15.4.3 m_requestUniqueId

```
UInt64 vwg::tls::TLSOcspCachedResponse::m_requestUniqueId  [private]
```

Definition at line 700 of file TLSApiTypes.h.

Referenced by getRequestUniqueId().

8.15.4.4 m_response

```
std::vector<UInt8> vwg::tls::TLSOcspCachedResponse::m_response  [private]
```

Definition at line 699 of file TLSApiTypes.h.

Referenced by getResponse().

8.15.4.5 m_thisUpdate

```
std::string vwg::tls::TLSOcspCachedResponse::m_thisUpdate  [private]
```

Definition at line 703 of file TLSApiTypes.h.

Referenced by getThisUpdate().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.16 vwg::tls::TLSOcspRequest Class Reference

This class represents a wrapper for a raw OCSP request message.

```
#include <TLSApiTypes.h>
```

Public Member Functions

- TLSOcspRequest (const std::string &url, const std::vector< UInt8 > &request)
  Constructor.
- TLSOcspRequest (const std::string &url, const std::vector< UInt8 > &request, const UInt64 uniqueId)
  Constructor.
- TLSOcspRequest (TLSOcspRequest &&)=default
- TLSOcspRequest (const TLSOcspRequest &)=default
- TLSOcspRequest & operator= (const TLSOcspRequest &)=default
- TLSOcspRequest & operator= (TLSOcspRequest &&)=default
- ~TLSOcspRequest ()=default
- UInt64 getUniqueId () const noexcept
  Gets unique ID that identifies the request.
- const std::vector< UInt8 > & getRequest () const noexcept
  Gets the OCSP request message.
- const std::string & getRequestUrl () const noexcept
  Gets request's OCSP Responder URL.

Private Member Functions

- void calculateUniqueId ()

  Calculates request's unique ID.

Private Attributes

- std::string m_responderUrl
- std::vector< UInt8 > m_request
- UInt64 m_uniqueId

Static Private Attributes

- static constexpr UInt8 OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE = 73

  Contains OCSP request size in bytes without "OCSP extensions" size).

8.16.1 Detailed Description

This class represents a wrapper for a raw OCSP request message.

Definition at line 389 of file TLSApiTypes.h.

8.16.2 Constructor & Destructor Documentation

8.16.2.1 TLSOcspRequest() [1/4]

```
vwg::tls::TLSOcspRequest::TLSOcspRequest (
            const std::string & url,
            const std::vector< UInt8 > & request )  [inline]
```

Constructor.

Parameters

in	*url*	String which contains the OCSP Responder's URL.
in	*request*	Vector of bytes which contains a single OCSP Request encoded in BER format.

Definition at line 398 of file TLSApiTypes.h.

References calculateUniqueId().

8.16.2.2 TLSOcspRequest() [2/4]

```
vwg::tls::TLSOcspRequest::TLSOcspRequest (
            const std::string & url,
            const std::vector< UInt8 > & request,
            const UInt64 uniqueId )  [inline]
```

Constructor.

Parameters

in	*url*	String which contains the OCSP Responder's URL.
in	*request*	Vector of bytes which contains a single OCSP Request message encoded in BER format.
in	*uniqueId*	OCSP Request's unique hash ID.

Definition at line 412 of file TLSApiTypes.h.

8.16.2.3 TLSOcspRequest() [3/4]

```
vwg::tls::TLSOcspRequest::TLSOcspRequest (
            TLSOcspRequest &&  )  [default]
```

8.16.2.4 TLSOcspRequest() [4/4]

```
vwg::tls::TLSOcspRequest::TLSOcspRequest (
            const TLSOcspRequest &  )  [default]
```

8.16.2.5 ~TLSOcspRequest()

```
vwg::tls::TLSOcspRequest::~TLSOcspRequest ( )  [default]
```

8.16.3 Member Function Documentation

8.16.3.1 calculateUniqueId()

```
void vwg::tls::TLSOcspRequest::calculateUniqueId ( )  [inline], [private]
```

Calculates request's unique ID.

this method calculates a unique ID by doing operations on the OCSP request (without "OCSP extensions") and the responder URL.

Definition at line 473 of file TLSApiTypes.h.

References m_request, m_responderUrl, m_uniqueId, and OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE.

Referenced by TLSOcspRequest().

8.16.3.2 getRequest()

```
const std::vector< UInt8 > & vwg::tls::TLSOcspRequest::getRequest ( ) const  [inline], [noexcept]
```

Gets the OCSP request message.

Returns

Vector of bytes that contains the request in BER encoding.

Definition at line 449 of file TLSApiTypes.h.

References m_request.

8.16.3.3 getRequestUrl()

```
const std::string & vwg::tls::TLSOcspRequest::getRequestUrl ( ) const  [inline], [noexcept]
```

Gets request's OCSP Responder URL.

Returns

string that tells the OCSP responder URL.

Definition at line 460 of file TLSApiTypes.h.

References m_responderUrl.

8.16.3.4 getUniqueId()

```
UInt64 vwg::tls::TLSOcspRequest::getUniqueId ( ) const  [inline], [noexcept]
```

Gets unique ID that identifies the request.

This shall be uniquely identifiable the OCSP request so it can be cached. Assuming that the same OCSP request will lead to the same OCSP response (apart from the fact the server is down, cert is revoked or network is not available etc...), one can save and rerun the OCSP request and can use the cached OCSP response.

Returns

OCSP request message unique ID.

Definition at line 438 of file TLSApiTypes.h.

References m_uniqueId.

8.16.3.5 operator=() [1/2]

```
TLSOcspRequest & vwg::tls::TLSOcspRequest::operator= (
            const TLSOcspRequest &  )  [default]
```

8.16.3.6 operator=() [2/2]

```
TLSOcspRequest & vwg::tls::TLSOcspRequest::operator= (
            TLSOcspRequest &&  )  [default]
```

8.16.4 Member Data Documentation

8.16.4.1 m_request

```
std::vector<UInt8> vwg::tls::TLSOcspRequest::m_request  [private]
```

Definition at line 491 of file TLSApiTypes.h.

Referenced by calculateUniqueId(), and getRequest().

8.16.4.2 m_responderUrl

```
std::string vwg::tls::TLSOcspRequest::m_responderUrl  [private]
```

Definition at line 490 of file TLSApiTypes.h.

Referenced by calculateUniqueId(), and getRequestUrl().

8.16.4.3 m_uniqueId

```
UInt64 vwg::tls::TLSOcspRequest::m_uniqueId  [private]
```

Definition at line 492 of file TLSApiTypes.h.

Referenced by calculateUniqueId(), and getUniqueId().

8.16.4.4 OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE

```
constexpr UInt8 vwg::tls::TLSOcspRequest::OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE = 73  [static],
[constexpr], [private]
```

Contains OCSP request size in bytes without "OCSP extensions" size).

Definition at line 497 of file TLSApiTypes.h.

Referenced by calculateUniqueId().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.17 vwg::tls::TLSOcspRequestResponse Class Reference

This class represents a wrapper for a raw OCSP response message which used as a result object from the OCSP. Proxy process after requests processing.

```
#include <TLSApiTypes.h>
```

Public Member Functions

- TLSOcspRequestResponse (const std::vector< UInt8 > &response, const Boolean isCached, const UInt64 requestUniqueId)

  Constructor.
- TLSOcspRequestResponse (const UInt64 requestUniqueId)

  Constructor.
- TLSOcspRequestResponse (TLSOcspRequestResponse &&)=default
- TLSOcspRequestResponse (const TLSOcspRequestResponse &)=default
- TLSOcspRequestResponse & operator= (const TLSOcspRequestResponse &)=default
- TLSOcspRequestResponse & operator= (TLSOcspRequestResponse &&)=default
- ~TLSOcspRequestResponse ()=default
- Boolean getIsCached () const noexcept

  Gets an OCSP Response caching status.
- const std::vector< UInt8 > & getResponse () const noexcept

  Gets the OCSP response message.
- UInt64 getRequestUniqueId () const noexcept

  Gets the unique ID of the related OCSP request for this OCSP response.
- Boolean isCorrupted () const noexcept

  Gets a boolean that tells if the response corrupted.

Private Attributes

- Boolean m_isCached
- std::vector< UInt8 > m_response
- UInt64 m_requestUniqueId
- Boolean m_isCorrupted

8.17.1 Detailed Description

This class represents a wrapper for a raw OCSP response message which used as a result object from the OCSP. Proxy process after requests processing.

Definition at line 504 of file TLSApiTypes.h.

8.17.2 Constructor & Destructor Documentation

8.17.2.1 TLSOcspRequestResponse() [1/4]

```
vwg::tls::TLSOcspRequestResponse::TLSOcspRequestResponse (
            const std::vector< UInt8 > & response,
            const Boolean isCached,
            const UInt64 requestUniqueId )  [inline]
```

Constructor.

Parameters

in	*response*	Vector of bytes which contains a single OCSP response encoded message in BER format.
in	*isCached*	Indicates if the object cached.
in	*requestUniqueId*	The unique ID of the related OCSP request.

Definition at line 514 of file TLSApiTypes.h.

8.17.2.2 TLSOcspRequestResponse() [2/4]

```
vwg::tls::TLSOcspRequestResponse::TLSOcspRequestResponse (
            const UInt64 requestUniqueId )  [inline]
```

Constructor.

Note

Use this constructor to build an OCSP request response object with is corrupted.

Parameters

in	*requestUniqueId*	The unique ID of the related OCSP request.

Definition at line 529 of file TLSApiTypes.h.

8.17.2.3 TLSOcspRequestResponse() [3/4]

```
vwg::tls::TLSOcspRequestResponse::TLSOcspRequestResponse (
            TLSOcspRequestResponse &&  )  [default]
```

8.17.2.4 TLSOcspRequestResponse() [4/4]

```
vwg::tls::TLSOcspRequestResponse::TLSOcspRequestResponse (
            const TLSOcspRequestResponse &  )  [default]
```

8.17.2.5 ~TLSOcspRequestResponse()

```
vwg::tls::TLSOcspRequestResponse::~TLSOcspRequestResponse ( )  [default]
```

8.17.3 Member Function Documentation

8.17.3.1 getIsCached()

```
Boolean vwg::tls::TLSOcspRequestResponse::getIsCached ( ) const  [inline], [noexcept]
```

Gets an OCSP Response caching status.

Returns

A boolean flag that indicates if OCSP Response cached or not cached.

Definition at line 551 of file TLSApiTypes.h.

References m_isCached.

8.17.3.2 getRequestUniqueId()

```
UInt64 vwg::tls::TLSOcspRequestResponse::getRequestUniqueId ( ) const  [inline], [noexcept]
```

Gets the unique ID of the related OCSP request for this OCSP response.

Returns

OCSP request message unique ID.

Definition at line 573 of file TLSApiTypes.h.

References m_requestUniqueId.

8.17.3.3 getResponse()

```
const std::vector< UInt8 > & vwg::tls::TLSOcspRequestResponse::getResponse ( ) const  [inline],
[noexcept]
```

Gets the OCSP response message.

Returns

Vector of bytes that contains the response in BER encoding.

Definition at line 562 of file TLSApiTypes.h.

References m_response.

8.17.3.4 isCorrupted()

```
Boolean vwg::tls::TLSOcspRequestResponse::isCorrupted ( ) const  [inline], [noexcept]
```

Gets a boolean that tells if the response corrupted.

Returns

Response corruption status.

Definition at line 584 of file TLSApiTypes.h.

References m_isCorrupted.

8.17.3.5 operator=() [1/2]

```
TLSOcspRequestResponse & vwg::tls::TLSOcspRequestResponse::operator= (
            const TLSOcspRequestResponse &  )  [default]
```

8.17.3.6 operator=() [2/2]

```
TLSOcspRequestResponse & vwg::tls::TLSOcspRequestResponse::operator= (
            TLSOcspRequestResponse &&  )  [default]
```

8.17.4 Member Data Documentation

8.17.4.1 m_isCached

```
Boolean vwg::tls::TLSOcspRequestResponse::m_isCached  [private]
```

Definition at line 591 of file TLSApiTypes.h.

Referenced by getIsCached().

8.17.4.2 m_isCorrupted

```
Boolean vwg::tls::TLSOcspRequestResponse::m_isCorrupted  [private]
```

Definition at line 594 of file TLSApiTypes.h.

Referenced by isCorrupted().

8.17.4.3 m_requestUniqueId

```
UInt64 vwg::tls::TLSOcspRequestResponse::m_requestUniqueId  [private]
```

Definition at line 593 of file TLSApiTypes.h.

Referenced by getRequestUniqueId().

8.17.4.4 m_response

```
std::vector<UInt8> vwg::tls::TLSOcspRequestResponse::m_response  [private]
```

Definition at line 592 of file TLSApiTypes.h.

Referenced by getResponse().

The documentation for this class was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h

8.18 vwg::tls::TLSResult< T > Struct Template Reference

This is a struct to return the return code or the value in case the operation is performed successful. Basically it will take a payload or an return code. One can assume that the paylod is empty if the operation failed. One have to use failed or succeeded first to check if the payload is set or not first. Currently it is assumed that the access of a empty payload will fail and an error is raised.

```
#include <TLSResult.h>
```

Public Types

- using TT = TLSResult< T >

Public Member Functions

- TLSResult ()
- TLSResult (TLSReturnCodes code)
- TLSResult (T payload)
- TT & operator= (const TT &other)
- bool failed ()

  Checks if the operation failed.
- bool succeeded ()

  Checks if the operation failed.
- T getPayload ()

  Gets the payload. ***Caution!</> this will raise an error if the payload is empty. please check the result with failed and succeeded before hand.***
- TLSReturnCodes getErrorCode ()

  Gets the error code.

Private Attributes

- Boolean m_isEmpty
- TLSReturnCodes m_rc
- T m_payload

8.18.1 Detailed Description

template<class T>
struct vwg::tls::TLSResult< T >

This is a struct to return the return code or the value in case the operation is performed successful. Basically it will take a payload or an return code. One can assume that the paylod is empty if the operation failed. One have to use failed or succeeded first to check if the payload is set or not first. Currently it is assumed that the access of a empty payload will fail and an error is raised.

Definition at line 27 of file TLSResult.h.

8.18.2 Member Typedef Documentation

8.18.2.1 TT

```
template<class T >
using vwg::tls::TLSResult< T >::TT = TLSResult<T>
```

Definition at line 28 of file TLSResult.h.

8.18.3 Constructor & Destructor Documentation

8.18.3.1 TLSResult() [1/3]

```
template<class T >
vwg::tls::TLSResult< T >::TLSResult ( )  [inline]
```

Definition at line 36 of file TLSResult.h.

8.18.3.2 TLSResult() [2/3]

```
template<class T >
vwg::tls::TLSResult< T >::TLSResult (
            TLSReturnCodes code )  [inline]
```

Definition at line 40 of file TLSResult.h.

8.18.3.3 TLSResult() [3/3]

```
template<class T >
vwg::tls::TLSResult< T >::TLSResult (
            T payload )  [inline]
```

Definition at line 44 of file TLSResult.h.

8.18.4 Member Function Documentation

8.18.4.1 failed()

```
template<class T >
bool vwg::tls::TLSResult< T >::failed ( )  [inline]
```

Checks if the operation failed.

Returns

true if operation failed and the payload is empty.

Definition at line 74 of file TLSResult.h.

References vwg::tls::TLSResult< T >::succeeded().

8.18.4.2 getErrorCode()

```
template<class T >
TLSReturnCodes vwg::tls::TLSResult< T >::getErrorCode ( )  [inline]
```

Gets the error code.

Returns

the error code.

Definition at line 110 of file TLSResult.h.

References vwg::tls::TLSResult< T >::m_rc.

8.18.4.3 getPayload()

```
template<class T >
T vwg::tls::TLSResult< T >::getPayload ( )  [inline]
```

Gets the payload. **Caution!</> this will raise an error if the payload is empty. please check the result with failed and succeeded before hand.**

Returns

the payload.

Definition at line 98 of file TLSResult.h.

References vwg::tls::TLSResult< T >::m_isEmpty, and vwg::tls::TLSResult< T >::m_payload.

8.18.4.4 operator=()

```
template<class T >
TT & vwg::tls::TLSResult< T >::operator= (
            const TT & other )  [inline]
```

Definition at line 53 of file TLSResult.h.

References vwg::tls::TLSResult< T >::m_isEmpty, vwg::tls::TLSResult< T >::m_payload, and vwg::tls::TLSResult< T >::m_rc.

8.18.4.5 succeeded()

```
template<class T >
bool vwg::tls::TLSResult< T >::succeeded ( )  [inline]
```

Checks if the operation failed.

Returns

true if operation failed and the payload is not empty.

Definition at line 85 of file TLSResult.h.

References vwg::tls::TLSResult< T >::m_rc, and vwg::tls::RC_TLS_SUCCESSFUL.

Referenced by vwg::tls::TLSResult< T >::failed().

8.18.5 Member Data Documentation

8.18.5.1 m_isEmpty

```
template<class T >
Boolean vwg::tls::TLSResult< T >::m_isEmpty  [private]
```

Definition at line 31 of file TLSResult.h.

Referenced by vwg::tls::TLSResult< T >::getPayload(), and vwg::tls::TLSResult< T >::operator=().

8.18.5.2 m_payload

```
template<class T >
T vwg::tls::TLSResult< T >::m_payload  [private]
```

Definition at line 33 of file TLSResult.h.

Referenced by vwg::tls::TLSResult< T >::getPayload(), and vwg::tls::TLSResult< T >::operator=().

8.18.5.3 m_rc

```
template<class T >
TLSReturnCodes vwg::tls::TLSResult< T >::m_rc  [private]
```

Definition at line 32 of file TLSResult.h.

Referenced by vwg::tls::TLSResult< T >::getErrorCode(), vwg::tls::TLSResult< T >::operator=(), and vwg::tls::TLSResult< T >::suc

The documentation for this struct was generated from the following file:

- /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSResult.h

Chapter 9

File Documentation

9.1 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/doxygen/mainTLSStreamAndSocketAPI.dox File Reference

9.2 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/CipherSuitesDefenitions.h File Reference

```
#include "vwgtypes.h"
```

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::CipherSuiteIds = std::string

Enumerations

- enum vwg::tls::CipherSuiteId : vwg::types::UInt16 {
  vwg::tls::TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA9 , vwg::tls::TLS_ECDHE_ECDSA_WITH_A
  = 0xC02C , vwg::tls::TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 = 0xC02B , vwg::tls::TLS_ECDHE_RSA_WITH_A
  = 0xC030 ,
  vwg::tls::TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 = 0xC02F , vwg::tls::TLS_DHE_RSA_WITH_AES_256_GCM_S
  = 0x009F , vwg::tls::TLS_DHE_RSA_WITH_AES_128_GCM_SHA256 = 0x009E , vwg::tls::TLS_ECDHE_ECDSA_WITH_AES_
  = 0xC023 ,
  vwg::tls::TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA8 , vwg::tls::TLS_DHE_RSA_WITH_CHACHA2

= 0xCCAA , vwg::tls::TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA = 0xC009 , vwg::tls::TLS_ECDHE_ECDSA_WITH_A
= 0xC00A ,
vwg::tls::TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256 = 0xC027 , vwg::tls::TLS_ECDHE_RSA_WITH_AES_128_CBC_
= 0xC013 , vwg::tls::TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA = 0xC014 , vwg::tls::TLS_DHE_RSA_WITH_AES_128_C
= 0x0067 ,
vwg::tls::TLS_DHE_RSA_WITH_AES_256_CBC_SHA256 = 0x006B , vwg::tls::TLS_RSA_WITH_AES_128_GCM_SHA256
= 0x009C , vwg::tls::TLS_RSA_WITH_AES_256_GCM_SHA384 = 0x009D , vwg::tls::TLS_RSA_WITH_AES_128_CBC_SHA2
= 0x003C ,
vwg::tls::TLS_RSA_WITH_AES_256_CBC_SHA256 = 0x003D , vwg::tls::TLS_RSA_WITH_AES_128_CBC_SHA
= 0x002F , vwg::tls::TLS_RSA_WITH_AES_256_CBC_SHA = 0x0035 , vwg::tls::TLS_RSA_WITH_3DES_EDE_CBC_SHA
= 0x000A }

This enum defines the list of permitted cipher suits.

9.3 CipherSuitesDefenitions.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004
00005 #ifndef INCLUDES_CIPHERSUITESDEFENITIONS_H_
00006 #define INCLUDES_CIPHERSUITESDEFENITIONS_H_
00007
00008 #include "vwgtypes.h"
00009
00010 namespace vwg {
00011 namespace tls {
00012
00016  enum CipherSuiteId : vwg::types::UInt16
00017  {
00018      TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA9,
00019      TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 = 0xC02C,
00020      TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 = 0xC02B,
00021      TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 = 0xC030,
00022      TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 = 0xC02F,
00023      TLS_DHE_RSA_WITH_AES_256_GCM_SHA384 = 0x009F,
00024      TLS_DHE_RSA_WITH_AES_128_GCM_SHA256 = 0x009E,
00025      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 = 0xC023,
00026      TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCA8,
00027      TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256 = 0xCCAA,
00028      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA = 0xC009,
00029      TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA = 0xC00A,
00030      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256 = 0xC027,
00031      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA = 0xC013,
00032      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA = 0xC014,
00033      TLS_DHE_RSA_WITH_AES_128_CBC_SHA256 = 0x0067,
00034      TLS_DHE_RSA_WITH_AES_256_CBC_SHA256 = 0x006B,
00035      TLS_RSA_WITH_AES_128_GCM_SHA256 = 0x009C,
00036      TLS_RSA_WITH_AES_256_GCM_SHA384 = 0x009D,
00037      TLS_RSA_WITH_AES_128_CBC_SHA256 = 0x003C,
00038      TLS_RSA_WITH_AES_256_CBC_SHA256 = 0x003D,
00039      TLS_RSA_WITH_AES_128_CBC_SHA = 0x002F,
00040      TLS_RSA_WITH_AES_256_CBC_SHA = 0x0035,
00041      TLS_RSA_WITH_3DES_EDE_CBC_SHA = 0x000A
00042  };
00043
00044
00045  using CipherSuiteIds = std::string;
00046
00047 } // namespace tls
00048 } // namespace vwg
00049
00050
00051 #endif /* INCLUDES_CIPHERSUITESDEFENITIONS_H_ */
```

9.4 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/InetAddress.h File Reference

```
#include <memory>
#include <sys/socket.h>
#include <netinet/in.h>
#include <cstddef>
#include <cstring>
#include <string>
#include "vwgtypes.h"
#include "TLSResult.h"
```

Classes

- class vwg::tls::IInetAddress

  Representation an interface of an IP address. Basically this will give you an immutable IP address interface.
- class vwg::tls::InetAddressFactory

  This a definition of a the factory to create instances of the IInetAddress. The supplier has to provide the implementation of the static methods by this class. Basically there is no need to create an instance of this class.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::SPIInetAddress = std::shared_ptr< IInetAddress >
- using vwg::tls::IInetAddressResult = TLSResult< SPIInetAddress >

9.5 InetAddress.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_INETADDRESS_H_
00005 #define SRC_INETADDRESS_H_
00006
00007
00008 #include <memory>
00009 #include <sys/socket.h>
00010 #include <netinet/in.h>
00011 #include <cstddef>
00012 #include <cstring>
00013 #include <string>
00014
00015 #include "vwgtypes.h"
00016 #include "TLSResult.h"
00017
00018 using namespace vwg::types;
```

```
00019
00020 namespace vwg
00021 {
00022 namespace tls
00023 {
00024
00028 class IInetAddress
00029 {
00030 public:
00031     IInetAddress() { memset(m_addr, 0, sizeof(m_addr)); }
00032     virtual ~IInetAddress() = default;
00033
00034 public:
00040     virtual Boolean isIPv6() = 0;
00041
00047     virtual Boolean isIPv4() = 0;
00048
00054     virtual std::string toString() = 0;
00055
00063     virtual Boolean isValid() = 0;
00064
00071     virtual UInt32 validate() = 0;
00072
00080     virtual sa_family_t getSaFamily() = 0;
00081
00087     virtual uint8_t*
00088     getAddr()
00089     {
00090         return m_addr;
00091     }
00092
00093 protected:
00094     uint8_t m_addr[16];
00095 };
00096
00097
00101 using SPIInetAddress = std::shared_ptr<IInetAddress>;
00102
00106 using IInetAddressResult = TLSResult<SPIInetAddress>;
00107
00113 class InetAddressFactory
00114 {
00115 private:
00116     InetAddressFactory() = default;
00117
00118 public:
00127     static IInetAddressResult makeIPAddress(const std::string inetAddr);
00128
00137     static IInetAddressResult makeIPAddress(const char* inetAdd);
00138 };
00139 } /* namespace tls */
00140 } /* namespace vwg */
00141
00142 #endif /* SRC_INETADDRESS_H_ */
```

9.6 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/IOStream.h File Reference

```
#include "vwgtypes.h"
```

Classes

- class vwg::tls::IOStream

  Representation an interface of an I/O stream. Can read, write and close.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Enumerations

- enum vwg::tls::StreamReturnCode { vwg::tls::RC_STREAM_WOULD_BLOCK = -1 , vwg::tls::RC_STREAM_IO_ERROR = -2 }

  Error values for receiving or sending data.

9.7 IOStream.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_STREAM_H_
00005 #define SRC_STREAM_H_
00006
00007 #include "vwgtypes.h"
00008
00009 namespace vwg
00010 {
00011 namespace tls
00012 {
00013 using vwg::types::UInt32;
00014
00018 typedef enum {
00019     RC_STREAM_WOULD_BLOCK = -1,
00020     RC_STREAM_IO_ERROR    = -2,
00021 } StreamReturnCode;
00022
00026 class IOStream
00027 {
00028 public:
00029     IOStream()          = default;
00030     virtual ~IOStream() = default;
00031
00032 public:
00042     virtual int32_t receive(void* buf, uint32_t len) = 0;
00043
00053     virtual int32_t send(const void* buf, uint32_t len) = 0;
00054
00058     virtual void close() = 0;
00059
00065     virtual bool isOpen() = 0;
00066
00072     virtual bool isClosed() = 0;
00073 };
00074
00075
00076 } /* namespace tls */
00077 } /* namespace vwg */
00078
00079 #endif /* SRC_STREAM_H_ */
```

9.8 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSApiTypes.h File Reference

```
#include <ctime>
#include <functional>
#include <future>
#include <queue>
#include "InetAddress.h"
#include "vwgtypes.h"
```

Classes

- class vwg::tls::IANAProtocolFunction

  This class contains some helper methods when conversion from the IANAProtocol enum value to Protocol name.
- struct vwg::tls::TimeCheckTime

  This is a structure that will be used to pass the authentic time. basically this time will be compared with the system time, as shown below.
- class vwg::tls::AlpnMode

  A setting container for ALPN supporting. There are basically three modes possible:
- class vwg::tls::TLSOcspRequest

  This class represents a wrapper for a raw OCSP request message.
- class vwg::tls::TLSOcspRequestResponse

  This class represents a wrapper for a raw OCSP response message which used as a result object from the OCSP. Proxy process after requests processing.
- class vwg::tls::TLSOcspCachedResponse

  This class represents a cached OCSP response message.
- class vwg::tls::ITLSOcspHandler

  This interface defines APIs to process and handle OCSP messages.
- class vwg::tls::TLSConnectionSettings

  this class is used to define the TLS connection properties for a backend TLS connection. This class contains a set of configuration properties for the TLS connection.
- class vwg::tls::ITLSErrorListener
- class vwg::tls::ITLSSocketBase

  This is an interface which defines a set of operation and features have to be available on each socket and session endpoint.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::ApiVersionType = std::string
- typedef void(∗ vwg::tls::ErrorHandler) (SPIInetAddress inet, const UInt16 port, const TLSReturnCodes errorCode)

Enumerations

- enum vwg::tls::IANAProtocol { vwg::tls::NONE = 0 , vwg::tls::HTTP = 1 , vwg::tls::HTTP2 = 2 }

  This enum defines the supported protocols which can be used in case ALPN is used. Please see the IANAProtocol definitions in RFC7230 https://tools.ietf.org/html/rfc7230.
- enum vwg::tls::TLSCipherSuiteUseCasesSettings : UInt32 { vwg::tls::CSUSDefault = 0 , vwg::tls::CSUSLegacy = 1 , vwg::tls::CSUSLongtermSecure = 2 , vwg::tls::CSUSIanaRecommended = 3 , vwg::tls::CSUSDefaultWithSoftFail = 4 , vwg::tls::CSUSEndOfEnum }
- enum vwg::tls::SecurityLevel : UInt32 { vwg::tls::AUTHENTIC_WITHPSK = 0 , vwg::tls::CONFIDENTIAL_WITHPSK = 1 }

  Defines the SSOA confidentiality.
- enum vwg::tls::SocketType : UInt32 { vwg::tls::SOCKETTYPE_STREAM = 0 , vwg::tls::SOCKETTYPE_DATAGRAM = 1 }

  Defines the socket type.
- enum vwg::tls::TLSDropSuppot : UInt32 { vwg::tls::TLS_NOT_DROPABLE = 0 , vwg::tls::TLS_DROPABLE = 1 }

Functions

- const ApiVersionType vwg::tls::ApiVersion ("TLS_API_1.2.0")

Variables

- static const unsigned int vwg::tls::MAX_PERMITTED_DEVIATION = 86400

  Defines the maximum permitted deviation of |expectedTime - system_time.now()|. since 1.1.0.
- static const TimeCheckTime vwg::tls::CHECK_TIME_OFF = {0, 0}

  Defines that time check is not required.
- static const UInt32 vwg::tls::DEFAULT_OCSP_ONLINE_TIMEOUT_MS = 30000

  Defines a default OCSP timeout in milliseconds.
- static const AlpnMode vwg::tls::ALPN_OFF = AlpnMode(std::vector<IANAProtocol>{NONE})

  Defines that ALPN is off and the protocol is undecided, this is identical to TLS without any ALPN support.
- static const AlpnMode vwg::tls::ALPN_DEFAULT = AlpnMode(std::vector<IANAProtocol>{HTTP})

  Defines the default ALPN.
- static const AlpnMode vwg::tls::ALPN_HTTP2 = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::↩ HTTP2})

  Defines HTTP2 ALPN.
- static const AlpnMode vwg::tls::ALPN_ANY = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2, IANAProtocol::HTTP})

  Defines all supported ALPN.
- static const std::string vwg::tls::CSUSDefaultStr = "default"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.
- static const std::string vwg::tls::CSUSDefaulWithSoftFailtStr = "default_with_soft_fail"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSDefault for more detail.
- static const std::string vwg::tls::CSUSLegacyStr = "legacy"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLegacy for more detail.
- static const std::string vwg::tls::CSUSLongtermSecureStr = "longterm_secure"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSLongtermSecure for more detail.
- static const std::string vwg::tls::CSUSIanaRecommendedStr = "iana_recommended"

  Defines a string constant for the cipher suits set, with is parallel to the enum. a string is more flexible for the interface design, but not as an enum. therefore the enum is used inside the TLS library. see TLSCipherSuiteUseCases↩ Settings::CSUSIanaRecommended for more detail.
- const UInt32 vwg::tls::MODE_BLOCKING = 0
- const UInt32 vwg::tls::MODE_ASYNC = 1

9.9 TLSApiTypes.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019, 2020 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004
00005 #ifndef SRC_TLSAPITYPES_H_
```

```
00006 #define SRC_TLSAPITYPES_H_
00007
00008 #include <ctime>
00009 #include <functional>
00010 #include <future>
00011 #include <queue>
00012
00013 #include "InetAddress.h"
00014 #include "vwgtypes.h"
00015
00016 using namespace vwg::types;
00017
00018 namespace vwg
00019 {
00020 namespace tls
00021 {
00022 using ApiVersionType = std::string;
00023 const ApiVersionType ApiVersion("TLS_API_1.2.0");
00024
00031 enum IANAProtocol {
00032     NONE  = 0,
00033     HTTP  = 1,
00034     HTTP2 = 2
00035     // SPDY_1 = 16, not yet supported.
00036     // SPDY_2 = 17, not yet supported.
00037     // SPDY_3 = 18  not yet supported.
00038 };
00039
00045 class IANAProtocolFunction final
00046 {
00047 public:
00048     IANAProtocolFunction()  = default;
00049     ~IANAProtocolFunction() = default;
00050
00051     const std::string ProtocolNameHTTP  = "http/1.1";
00052     const std::string ProtocolNameHTTP2 = "h2";
00053
00062     bool
00063     toIANAProtocolName(const IANAProtocol& protocol, std::string& oProtocolName)
00064     {
00065         switch (protocol) {
00066         case IANAProtocol::HTTP:
00067             oProtocolName = ProtocolNameHTTP;
00068             return true;
00069
00070         case IANAProtocol::HTTP2:
00071             oProtocolName = ProtocolNameHTTP2;
00072             return true;
00073
00074         default:
00075             return false;
00076         }
00077     }
00078 };
00079
00084 const static unsigned int MAX_PERMITTED_DEVIATION = 86400;
00085
00098 struct TimeCheckTime {
00105     std::time_t expectedTime;
00106
00110     int permittedDeviation;
00111 };
00112
00116 const static TimeCheckTime CHECK_TIME_OFF = {0, 0};
00117
00121 const static UInt32 DEFAULT_OCSP_ONLINE_TIMEOUT_MS = 30000;
00122
00140 class AlpnMode final
00141 {
00142 public:
00148     explicit AlpnMode(const std::vector<std::string>& userDefinedAlpnSetting)
00149       : m_userDefinedALPNisUsed(true)
00150       , m_userDefinedAlpnSetting(userDefinedAlpnSetting)
00151     {
00152     }
00153
00159     explicit AlpnMode(const std::vector<IANAProtocol>& supportedProtocols)
00160       : m_userDefinedALPNisUsed(false)
00161       , m_supportedProtocols(supportedProtocols)
00162     {
00163     }
00164
00165     virtual ~AlpnMode() = default;
00166
00167 public:
00173     bool
00174     userDefinedALPNisUsed() const
```

```
00175     {
00176         return m_userDefinedALPNisUsed;
00177     }
00178
00184     const std::vector<IANAProtocol>&
00185     getSupportedProtocols() const
00186     {
00187         return m_supportedProtocols;
00188     }
00189
00195     const std::vector<std::string>&
00196     getUserDefinedAlpnSetting() const
00197     {
00198         return m_userDefinedAlpnSetting;
00199     }
00200
00201 private:
00202     bool                     m_userDefinedALPNisUsed;
00203     std::vector<std::string>  m_userDefinedAlpnSetting;
00204     std::vector<IANAProtocol> m_supportedProtocols;
00205 };
00206
00211 const static AlpnMode ALPN_OFF = AlpnMode(std::vector<IANAProtocol>{NONE});
00212
00216 const static AlpnMode ALPN_DEFAULT = AlpnMode(std::vector<IANAProtocol>{HTTP});
00217
00221 const static AlpnMode ALPN_HTTP2 = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2});
00222
00226 const static AlpnMode ALPN_ANY = AlpnMode(std::vector<IANAProtocol>{IANAProtocol::HTTP2,
      IANAProtocol::HTTP});
00227
00329 enum TLSCipherSuiteUseCasesSettings : UInt32 {
00330     CSUSDefault             = 0,
00331     CSUSLegacy              = 1,
00332     CSUSLongtermSecure      = 2,
00333     CSUSIanaRecommended     = 3,
00334     CSUSDefaultWithSoftFail = 4,
00335     CSUSEndOfEnum
00336 };
00337
00346 const static std::string CSUSDefaultStr = "default";
00347
00356 const static std::string CSUSDefaulWithSoftFailtStr = "default_with_soft_fail";
00357
00366 const static std::string CSUSLegacyStr = "legacy";
00375 const static std::string CSUSLongtermSecureStr = "longterm_secure";
00384 const static std::string CSUSIanaRecommendedStr = "iana_recommended";
00385
00389 class TLSOcspRequest final
00390 {
00391 public:
00398     TLSOcspRequest(const std::string& url, const std::vector<UInt8>& request)
00399       : m_responderUrl(url)
00400       , m_request(request)
00401     {
00402         calculateUniqueId();
00403     }
00404
00412     TLSOcspRequest(const std::string& url, const std::vector<UInt8>& request, const UInt64 uniqueId)
00413       : m_responderUrl(url)
00414       , m_request(request)
00415       , m_uniqueId(uniqueId)
00416     {
00417     }
00418
00419     TLSOcspRequest(TLSOcspRequest&&)      = default;
00420     TLSOcspRequest(const TLSOcspRequest&) = default;
00421     TLSOcspRequest& operator=(const TLSOcspRequest&) = default;
00422     TLSOcspRequest& operator=(TLSOcspRequest&&) = default;
00423
00424     ~TLSOcspRequest() = default;
00425
00426 public:
00437     UInt64
00438     getUniqueId() const noexcept
00439     {
00440         return m_uniqueId;
00441     }
00442
00448     const std::vector<UInt8>&
00449     getRequest() const noexcept
00450     {
00451         return m_request;
00452     }
00453
00459     const std::string&
00460     getRequestUrl() const noexcept
```

```
00461     {
00462         return m_responderUrl;
00463     }
00464
00465 private:
00472     void
00473     calculateUniqueId()
00474     {
00475         std::hash<std::string> strHashCalc;
00476         std::string            requestString(m_request.begin(), m_request.end());
00477
00478         // The requestString contains the OCSP request and it can be with "OCSP extensions".
00479         // Takes only the OCSP request without "OCSP extensions", since the "OCSP extensions" can
      contain "OCSP Nonce
00480         // Extension". "OCSP Nonce Extension" generated cryptographically then the nonce value would
      be different for the
00481         // same OCSP request, so in order to get the same ID for the same OCSP request it calculates
      the ID by the OCSP
00482         // request without "OCSP extensions".
00483         requestString = requestString.substr(0, OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE);
00484
00485         m_uniqueId =
00486             (UInt64)((strHashCalc(m_responderUrl) ^ (strHashCalc(requestString) << 1)) *
      0x9e3779b97f4a7c15ULL);
00487     }
00488
00489 private:
00490     std::string        m_responderUrl;
00491     std::vector<UInt8> m_request;
00492     UInt64             m_uniqueId;
00493
00497     static constexpr UInt8 OCSP_REQUEST_WITHOUT_EXTENSIONS_SIZE = 73;
00498 };
00499
00504 class TLSOcspRequestResponse final
00505 {
00506 public:
00514     TLSOcspRequestResponse(const std::vector<UInt8>& response, const Boolean isCached, const UInt64
      requestUniqueId)
00515       : m_isCached(isCached)
00516       , m_response(response)
00517       , m_requestUniqueId(requestUniqueId)
00518       , m_isCorrupted(false)
00519     {
00520     }
00521
00529     TLSOcspRequestResponse(const UInt64 requestUniqueId)
00530       : m_isCached(false)
00531       , m_response()
00532       , m_requestUniqueId(requestUniqueId)
00533       , m_isCorrupted(true)
00534     {
00535     }
00536
00537     TLSOcspRequestResponse(TLSOcspRequestResponse&&)      = default;
00538     TLSOcspRequestResponse(const TLSOcspRequestResponse&) = default;
00539     TLSOcspRequestResponse& operator=(const TLSOcspRequestResponse&) = default;
00540     TLSOcspRequestResponse& operator=(TLSOcspRequestResponse&&) = default;
00541
00542     ~TLSOcspRequestResponse() = default;
00543
00544 public:
00550     Boolean
00551     getIsCached() const noexcept
00552     {
00553         return m_isCached;
00554     }
00555
00561     const std::vector<UInt8>&
00562     getResponse() const noexcept
00563     {
00564         return m_response;
00565     }
00566
00572     UInt64
00573     getRequestUniqueId() const noexcept
00574     {
00575         return m_requestUniqueId;
00576     }
00577
00583     Boolean
00584     isCorrupted() const noexcept
00585     {
00586         return m_isCorrupted;
00587     }
00588
00589
```

```
00590 private:
00591     Boolean            m_isCached;
00592     std::vector<UInt8> m_response;
00593     UInt64             m_requestUniqueId;
00594     Boolean            m_isCorrupted;
00595 };
00596
00600 class TLSOcspCachedResponse final
00601 {
00602 public:
00616     TLSOcspCachedResponse(const std::vector<UInt8>& response,
00617                           const UInt64              requestUniqueId,
00618                           const std::string&        producedAtDate,
00619                           const std::string&        nextUpdateDate,
00620                           const std::string&        thisUpdateDate)
00621       : m_response(response)
00622       , m_requestUniqueId(requestUniqueId)
00623       , m_producedAt(producedAtDate)
00624       , m_nextUpdate(nextUpdateDate)
00625       , m_thisUpdate(thisUpdateDate)
00626     {
00627     }
00628
00629     TLSOcspCachedResponse(TLSOcspCachedResponse&&)      = default;
00630     TLSOcspCachedResponse(const TLSOcspCachedResponse&) = default;
00631     TLSOcspCachedResponse& operator=(const TLSOcspCachedResponse&) = default;
00632     TLSOcspCachedResponse& operator=(TLSOcspCachedResponse&&) = default;
00633
00634     ~TLSOcspCachedResponse() = default;
00635
00636 public:
00642     const std::vector<UInt8>&
00643     getResponse() const noexcept
00644     {
00645         return m_response;
00646     }
00647
00653     UInt64
00654     getRequestUniqueId() const noexcept
00655     {
00656         return m_requestUniqueId;
00657     }
00658
00666     const std::string&
00667     getProducedAt() const noexcept
00668     {
00669         return m_producedAt;
00670     }
00671
00679     const std::string&
00680     getNextUpdate() const noexcept
00681     {
00682         return m_nextUpdate;
00683     }
00684
00692     const std::string&
00693     getThisUpdate() const noexcept
00694     {
00695         return m_thisUpdate;
00696     }
00697
00698 private:
00699     std::vector<UInt8> m_response;
00700     UInt64             m_requestUniqueId;
00701     std::string        m_producedAt;
00702     std::string        m_nextUpdate;
00703     std::string        m_thisUpdate;
00704 };
00705
00709 class ITLSOcspHandler
00710 {
00711 public:
00712     ITLSOcspHandler()          = default;
00713     virtual ~ITLSOcspHandler() = default;
00714
00715 public:
00728     virtual void cacheResponses(const std::vector<TLSOcspCachedResponse>& responses) noexcept = 0;
00729
00746     virtual std::future<std::vector<TLSOcspRequestResponse>> processRequests(
00747         const std::vector<TLSOcspRequest>& requests) noexcept = 0;
00748 };
00749
00785 class TLSConnectionSettings final
00786 {
00787 public:
00799     TLSConnectionSettings(
00800         const AlpnMode&               alpnMode,
```

```
00801         TLSCipherSuiteUseCasesSettings cipherSuiteSettings =
      TLSCipherSuiteUseCasesSettings::CSUSDefault,
00802         const std::string& connectionLoggingName = "")
00803       : m_alpnMode(alpnMode)
00804       , m_ocspHandler(nullptr)
00805       , m_ocspTimeoutMs(DEFAULT_OCSP_ONLINE_TIMEOUT_MS)
00806       , m_cipherSuiteSettings(cipherSuiteSettings)
00807       , m_connectionLoggingName(connectionLoggingName)
00808     {
00809     }
00810
00823     TLSConnectionSettings(
00824         const AlpnMode&                 alpnMode,
00825         std::shared_ptr<ITLSOcspHandler> ocspHandler,
00826         const UInt32                    ocspTimeoutMs       = DEFAULT_OCSP_ONLINE_TIMEOUT_MS,
00827         TLSCipherSuiteUseCasesSettings   cipherSuiteSettings =
      TLSCipherSuiteUseCasesSettings::CSUSDefault,
00828         const std::string& connectionLoggingName = "")
00829       : m_alpnMode(alpnMode)
00830       , m_ocspHandler(ocspHandler)
00831       , m_ocspTimeoutMs(ocspTimeoutMs)
00832       , m_cipherSuiteSettings(cipherSuiteSettings)
00833       , m_connectionLoggingName(connectionLoggingName)
00834     {
00835     }
00836
00851     TLSConnectionSettings(
00852         const AlpnMode& alpnMode,
00853         const std::string& cipherSuiteSettings,
00854         const std::string& connectionLoggingName = "")
00855       : m_alpnMode(alpnMode)
00856       , m_ocspHandler(nullptr)
00857       , m_ocspTimeoutMs(DEFAULT_OCSP_ONLINE_TIMEOUT_MS)
00858       , m_cipherSuiteSettings(TLSCipherSuiteUseCasesSettings::CSUSDefault)
00859       , m_connectionLoggingName(connectionLoggingName)
00860     {
00861         if (CSUSLegacyStr == cipherSuiteSettings) {
00862             m_cipherSuiteSettings = TLSCipherSuiteUseCasesSettings::CSUSLegacy;
00863         } else if (CSUSLongtermSecureStr == cipherSuiteSettings) {
00864             m_cipherSuiteSettings = TLSCipherSuiteUseCasesSettings::CSUSLongtermSecure;
00865         } else if (CSUSIanaRecommendedStr == cipherSuiteSettings) {
00866             m_cipherSuiteSettings = TLSCipherSuiteUseCasesSettings::CSUSIanaRecommended;
00867         } else if (CSUSDefaulWithSoftFailtStr == cipherSuiteSettings) {
00868             m_cipherSuiteSettings = TLSCipherSuiteUseCasesSettings::CSUSDefaultWithSoftFail;
00869         }
00870
00871         // else CSUSDefault was chosen
00872     }
00873
00874     ~TLSConnectionSettings() = default;
00875
00881     const TLSCipherSuiteUseCasesSettings&
00882     getCipherSuiteUseCasesSettings() const
00883     {
00884         return m_cipherSuiteSettings;
00885     }
00886
00892     const AlpnMode&
00893     getAlpnMode() const
00894     {
00895         return m_alpnMode;
00896     }
00897
00903     const std::shared_ptr<ITLSOcspHandler>&
00904     getOcspHandler() const
00905     {
00906         return m_ocspHandler;
00907     }
00908
00914     const UInt32&
00915     getOcspTimeoutMs() const
00916     {
00917         return m_ocspTimeoutMs;
00918     }
00919
00927    std::string getConnectionLoggingName() const
00928    {
00929        return m_connectionLoggingName;
00930    }
00931
00932
00933 private:
00934     const AlpnMode                  m_alpnMode;
00935     std::shared_ptr<ITLSOcspHandler> m_ocspHandler;
00936     const UInt32                    m_ocspTimeoutMs;
00937     TLSCipherSuiteUseCasesSettings   m_cipherSuiteSettings;
00938     std::string                     m_connectionLoggingName;
```

```
00939 };
00940
00941 const UInt32 MODE_BLOCKING = 0;
00942 const UInt32 MODE_ASYNC    = 1;
00943
00951 enum SecurityLevel : UInt32 { AUTHENTIC_WITHPSK = 0, CONFIDENTIAL_WITHPSK = 1 };
00952
00960 enum SocketType : UInt32 { SOCKETTYPE_STREAM = 0, SOCKETTYPE_DATAGRAM = 1 };
00961
00962 enum TLSDropSuppot : UInt32 { TLS_NOT_DROPABLE = 0, TLS_DROPABLE = 1 };
00963
00973 typedef void (*ErrorHandler)(SPIInetAddress inet, const UInt16 port, const TLSReturnCodes errorCode);
00974
00975 class ITLSErrorListener
00976 {
00977 public:
00978     ITLSErrorListener()          = default;
00979     virtual ~ITLSErrorListener() = default;
00980
00981 public:
00982     virtual void errorListener(SPIInetAddress inet, const UInt16 port, const TLSReturnCodes errorCode)
       = 0;
00983 };
00984
00989 class ITLSSocketBase
00990 {
00991 public:
00992     ITLSSocketBase()          = default;
00993     virtual ~ITLSSocketBase() = default;
00994
00995 public:
01001     Boolean
01002     isDatagramSocket()
01003     {
01004         return !isConnectionSocket();
01005     };
01006
01012     virtual Boolean isConnectionSocket() = 0;
01013
01019     virtual void close() = 0;
01020
01026     virtual Boolean isClosed() = 0;
01027
01033     virtual Boolean isOpen() = 0;
01034
01042     virtual Boolean
01043     isErrorState()
01044     {
01045         return !m_errors.empty();
01046     };
01047
01053     virtual UInt16 getLocalPort() = 0;
01054
01059     virtual SPIInetAddress getLocalInetAddress() = 0;
01060
01067     virtual Int32
01068     getPendingErrors()
01069     {
01070         if (m_errors.empty()) {
01071             return -1;
01072         }
01073
01074         Int32 ret = m_errors.front();
01075         m_errors.pop();
01076         return ret;
01077     }
01078
01086     virtual const AlpnMode& getUsedAlpnMode() const = 0;
01087
01095     virtual IANAProtocol getUsedProtocol() const = 0;
01096
01097 protected:
01103     virtual void
01104     addPendingError(Int32 err)
01105     {
01106         m_errors.push(err);
01107     }
01108
01109     std::queue<Int32> m_errors;
01110 };
01111
01112 } /* namespace tls */
01113 } /* namespace vwg */
01114
01115
01116 #endif /* SRC_TLSAPITYPES_H_ */
```

9.10 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tls↩ API/includes/TLSCertStore.h File Reference

Functions

- CertStoreID createMOSKeyStore ()

9.10.1 Function Documentation

9.10.1.1 createMOSKeyStore()

```
CertStoreID createMOSKeyStore ( )
```

Experimantal API for a x509 keystore This is not part of the TLS API, but will belong to the set of API needed to implement features for the backend TLS. enum keystores list all MOS keystores create a MOS keystore

9.11 TLSCertStore.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004
00005 #ifndef INCLUDES_TLSCERTSTORE_H_
00006 #define INCLUDES_TLSCERTSTORE_H_
00007
00024 CertStoreID createMOSKeyStore();
00025
00042 #endif /* INCLUDES_TLSCERTSTORE_H_ */
```

9.12 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tls↩ API/includes/TLSLibApi.h File Reference

```
#include <memory>
#include "TLSResult.h"
#include "InetAddress.h"
#include "TLSSockets.h"
#include "TLSSocketFactory.h"
```

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Functions

- ITLSSocketFactoryResult vwg::tls::initTLSLib ()

  This is the entry point for the library. This will return the Socket factory when all initialization needed are successfully performed. These is basically initialization of:
- void vwg::tls::cleanupTLSLib ()

  Use this method to cleanup the implementation. This can be used to cleanup the TLS library (e.g. Wolf SSL or Botan SSL). after this the ITLSSocketFactory will not return any socket instance.

9.13 TLSLibApi.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004
00005 #ifndef SRC_TLSLIBAPI_H_
00006 #define SRC_TLSLIBAPI_H_
00007
00008 #include <memory>
00009
00010 #include "TLSResult.h"
00011 #include "InetAddress.h"
00012 #include "TLSSockets.h"
00013 #include "TLSSocketFactory.h"
00014
00020 namespace vwg {
00021 namespace tls {
00022
00032 extern ITLSSocketFactoryResult initTLSLib();
00033
00039 extern void cleanupTLSLib();
00040
00041 } /* namespace tls */
00042 } /* namespace vwg */
00043
00044 #endif /* SRC_TLSLIBAPI_H_ */
```

9.14 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tls↩ API/includes/TLSResult.h File Reference

```
#include <TLSReturnCodes.h>
#include <memory>
#include <cassert>
#include "vwgtypes.h"
```

Classes

- struct vwg::tls::TLSResult< T >

  This is a struct to return the return code or the value in case the operation is performed successful. Basically it will take a payload or an return code. One can assume that the paylod is empty if the operation failed. One have to use failed or succeeded first to check if the payload is set or not first. Currently it is assumed that the access of a empty payload will fail and an error is raised.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

9.15 TLSResult.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_TLSRESULT_H_
00005 #define SRC_TLSRESULT_H_
00006
00007 #include <TLSReturnCodes.h>
00008 #include <memory>
00009 #include <cassert>
00010
00011 #include "vwgtypes.h"
00012
00013
00014 using namespace vwg::types;
00015
00016 namespace vwg
00017 {
00018 namespace tls
00019 {
00026 template <class T>
00027 struct TLSResult {
00028     using TT = TLSResult<T>;
00029
00030 private:
00031     Boolean        m_isEmpty;
00032     TLSReturnCodes m_rc;
00033     T              m_payload;
00034
00035 public:
00036     TLSResult()
00037       : m_isEmpty(true)
00038       , m_rc(RC_TLS_PROGRAMMING_ERROR_RESULT){};
00039
00040     TLSResult(TLSReturnCodes code)
00041       : m_isEmpty(true)
00042       , m_rc(code){};
00043
00044     TLSResult(T payload)
00045       : m_isEmpty(false)
00046       , m_rc(RC_TLS_SUCCESSFUL)
00047       , m_payload(payload){
00048
00049         };
00050
00051
00052     TT&
00053     operator=(const TT& other)
00054     {
00055         // check for self-assignment
00056         if (&other == this)
00057             return *this;
00058
00059         this->m_isEmpty = other.m_isEmpty;
00060         this->m_rc      = other.m_rc;
00061         if (!m_isEmpty) {
00062             this->m_payload = other.m_payload;
00063         }
00064         return *this;
00065     }
00066
00067
00073     inline bool
00074     failed()
00075     {
00076         return !succeeded();
00077     };
00078
00084     inline bool
```

```
00085     succeeded()
00086     {
00087         return (m_rc == RC_TLS_SUCCESSFUL);
00088     }
00089
00097     T
00098     getPayload()
00099     {
00100         assert(!m_isEmpty);
00101         return m_payload;
00102     }
00103
00109     TLSReturnCodes
00110     getErrorCode()
00111     {
00112         return m_rc;
00113     }
00114 };
00115
00116
00117 } /* namespace tls */
00118 } /* namespace vwg */
00119
00120 #endif /* SRC_TLSRESULT_H_ */
```

9.16 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSReturnCodes.h File Reference

```
#include "vwgtypes.h"
```

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Enumerations

- enum vwg::tls::TLSReturnCodes : Int32 {
  vwg::tls::RC_TLS_SUCCESSFUL = 0 , vwg::tls::RC_TLS_INIT_FAILED = 1 , vwg::tls::RC_TLS_CONNECT_FAILED , vwg::tls::RC_TLS_ACCEPT_FAILED ,
  vwg::tls::RC_TLS_INVALID_DOMAIN , vwg::tls::RC_TLS_KEY_MISSING , vwg::tls::RC_TLS_KEY_ERROR , vwg::tls::RC_TLS_USAGE_AFTER_CLEANUP ,
  vwg::tls::RC_TLS_IO_ERROR , vwg::tls::RC_TLS_WOULD_BLOCK_READ , vwg::tls::RC_TLS_WOULD_BLOCK_WRITE , vwg::tls::RC_TLS_PEER_CLOSED ,
  vwg::tls::RC_TLS_AUTHENTIC_TIMECHECK_FAILED , vwg::tls::RC_TLS_MAX_PERMITTED_DEVIATION , vwg::tls::RC_TLS_SEND_AFTER_SHUTDOWN , vwg::tls::RC_TLS_INVALID_IP = 1000 ,
  vwg::tls::RC_TLS_DROPPING_NOTSUPPORTED , vwg::tls::RC_TLS_DROPPING_FAILED , vwg::tls::RC_TLS_PUBLIC_KEY , vwg::tls::RC_TLS_UNEXPECTED_MESSAGE = 2010 ,
  vwg::tls::RC_TLS_BAD_RECORD_MAC = 2020 , vwg::tls::RC_TLS_RECORD_OVERFLOW = 2022 ,
  vwg::tls::RC_TLS_DECOMPRESSION_FAILURE = 2030 , vwg::tls::RC_TLS_HANDSHAKE_FAILURE = 2040 ,
  vwg::tls::RC_TLS_BAD_CERTIFICATE = 2042 , vwg::tls::RC_TLS_UNSUPPORTED_CERTIFICATE = 2043 , vwg::tls::RC_TLS_CERTIFICATE_REVOKED = 2044 , vwg::tls::RC_TLS_CERTIFICATE_EXPIRED = 2045 ,
  vwg::tls::RC_TLS_CERTIFICATE_UNKNOWN = 2046 , vwg::tls::RC_TLS_ILLEGAL_PARAMETER = 2047 ,

vwg::tls::RC_TLS_UNKOWN_CA = 2048 , vwg::tls::RC_TLS_UNKNOWN_CA = 2048 ,
vwg::tls::RC_TLS_ACCESS_DENIED = 2049 , vwg::tls::RC_TLS_DECODE_ERROR = 2050 , vwg::tls::RC_TLS_DECRYPT_E
= 2051 , vwg::tls::RC_TLS_PROTOCOL_VERSION = 2070 ,
vwg::tls::RC_TLS_INSUFFICIENT_SECURITY = 2071 , vwg::tls::RC_TLS_NO_RENEGOTIATION = 2100 ,
vwg::tls::RC_TLS_UNSUPPORTED_EXTENSION = 2110 , vwg::tls::RC_TLS_NO_APPLICATION_PROTOCOL
= 2120 ,
vwg::tls::RC_TLS_TEE_ACCESS_ERROR = 3000 , vwg::tls::RC_TLS_CERTSTORE_NOT_FOUND ,
vwg::tls::RC_TLS_UNKNOWN_CLIENT_CERTIFICATE_SET_ID , vwg::tls::RC_TLS_CLIENT_CERTIFICATE_SET_IDERROR
,
vwg::tls::RC_TLS_PROGRAMMING_ERROR_RESULT = -1000 }

9.17 TLSReturnCodes.h

Go to the documentation of this file.

```
00001 /*
00002 * Copyright (c) 2019, 2020 Volkswagen AG (EES). All Rights Reserved.
00003 */
00004
00005 #ifndef SRC_TLSRETURNCODES_H_
00006 #define SRC_TLSRETURNCODES_H_
00007
00008 #include "vwgtypes.h"
00009
00010 using namespace vwg::types;
00011
00012 namespace vwg {
00013 namespace tls {
00014
00015 enum TLSReturnCodes : Int32
00016 {
00017     RC_TLS_SUCCESSFUL = 0,
00018
00019
00020     RC_TLS_INIT_FAILED = 1,
00021     RC_TLS_CONNECT_FAILED,
00022     RC_TLS_ACCEPT_FAILED,
00023
00028     RC_TLS_INVALID_DOMAIN,
00029
00033     RC_TLS_KEY_MISSING,
00034
00040     RC_TLS_KEY_ERROR,
00041
00045     RC_TLS_USAGE_AFTER_CLEANUP,
00046
00050     RC_TLS_IO_ERROR,
00051
00057     RC_TLS_WOULD_BLOCK_READ,
00058     RC_TLS_WOULD_BLOCK_WRITE,
00059
00063     RC_TLS_PEER_CLOSED,
00067     RC_TLS_AUTHENTIC_TIMECHECK_FAILED,
00071     RC_TLS_MAX_PERMITTED_DEVIATION,
00075     RC_TLS_SEND_AFTER_SHUTDOWN,
00076
00080     RC_TLS_INVALID_IP = 1000,
00081     RC_TLS_DROPPING_NOTSUPPORTED,
00082     RC_TLS_DROPPING_FAILED,
00083
00084     /*
00085     * brief RC_TLS_PUBLIC_KEY_PINNING_FAILED shall be returned in case the operation (e.g. TLS
      handshake) will fail. This shall improve the error finding during development.
00086     */
00087     RC_TLS_PUBLIC_KEY_PINNING_FAILED,
00088
00089     /* From the alert codes in rfc5246
00090     * the number of the alert code + 2000 to avoid number clashes. */
00091
00092     RC_TLS_UNEXPECTED_MESSAGE = 2010,
00093     RC_TLS_BAD_RECORD_MAC = 2020,
00094     /* ignore until official defined in the TLS-RFC. Until than the error will be mapped to the common
      failure code
00095     * RC_TLS_DECRYPTION_FAILD_RESERVED = 2021, */
00096     RC_TLS_RECORD_OVERFLOW  = 2022,
00097     RC_TLS_DECOMPRESSION_FAILURE = 2030,
00098     RC_TLS_HANDSHAKE_FAILURE = 2040,
```

```
00099     /* ignore until official defined in the TLS-RFC. Until than the error will be mapped to the common
      failure code
00100     *   RC_TLS_NO_CERTIFICATE_RESERVED = 2041, */
00101     RC_TLS_BAD_CERTIFICATE = 2042,
00102     RC_TLS_UNSUPPORTED_CERTIFICATE = 2043,
00103     RC_TLS_CERTIFICATE_REVOKED   = 2044,
00104     RC_TLS_CERTIFICATE_EXPIRED  = 2045,
00105     RC_TLS_CERTIFICATE_UNKNOWN   = 2046,
00106     RC_TLS_ILLEGAL_PARAMETER    = 2047,
00107     RC_TLS_UNKOWN_CA    = 2048,    // Deprecated
00108     RC_TLS_UNKNOWN_CA    = 2048,   // RMA Correction of typo added.
00109     RC_TLS_ACCESS_DENIED     = 2049,
00110     RC_TLS_DECODE_ERROR     = 2050,
00111     RC_TLS_DECRYPT_ERROR       = 2051,
00112     /*  ignore until official defined in the TLS-RFC. Until than the error will be mapped to the
      common failure code
00113     * RC_TLS_EXPORT_RESTRICTION_RESERVED   = 2060, */
00114     RC_TLS_PROTOCOL_VERSION   = 2070,
00115     RC_TLS_INSUFFICIENT_SECURITY   = 2071,
00116     RC_TLS_NO_RENEGOTIATION = 2100,
00117     RC_TLS_UNSUPPORTED_EXTENSION = 2110,
00118
00125     RC_TLS_NO_APPLICATION_PROTOCOL = 2120,
00126
00131     RC_TLS_TEE_ACCESS_ERROR = 3000,
00132
00137     RC_TLS_CERTSTORE_NOT_FOUND,
00138
00143     RC_TLS_UNKNOWN_CLIENT_CERTIFICATE_SET_ID,
00144
00149     RC_TLS_CLIENT_CERTIFICATE_SET_IDERROR,
00150
00155     RC_TLS_PROGRAMMING_ERROR_RESULT = -1000,
00156 };
00157
00158
00159
00160 } /* namespace tls */
00161 } /* namespace vwg */
00162
00163 #endif /* SRC_TLSRETURNCODES_H_ */
```

9.18 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSession.h File Reference

```
#include <functional>
#include <string>
#include <memory>
#include "TLSApiTypes.h"
#include "vwgtypes.h"
#include "TLSReturnCodes.h"
```

Classes

- class vwg::tls::ITLSSessionEndpoint

  Represents a communication session between a service provider and a service consumer. This interface must be implemented by the supplier.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::SPITLSSessionEndpoint = std::shared_ptr< ITLSSessionEndpoint >
- using vwg::tls::TLSSessionStatusListener = std::function< void(SPITLSSessionEndpoint endpoint, const TLSSessionStatus status)>
- using vwg::tls::TLSDropStatusListener = std::function< void(SPITLSSessionEndpoint endpoint, const TLSDropStatus status)>
- using vwg::tls::SPTLSSessionEndpoint = std::shared_ptr< ITLSSessionEndpoint >
- using vwg::tls::TLSSessionEndpointResult = TLSResult< SPTLSSessionEndpoint >

Enumerations

- enum vwg::tls::TLSDropStatus : UInt32 { vwg::tls::TLSDROP_SECURED , vwg::tls::TLSDROP_DROPPED , vwg::tls::TLSDROP_REQUESTED , vwg::tls::TLSDROP_SEND_LOCKED , vwg::tls::TLSDROP_PERFORMED }
- enum vwg::tls::TLSSessionStatus : UInt32 { vwg::tls::TLSSESSION_SECURED , vwg::tls::TLSSESSION_UNSECURED , vwg::tls::TLSSESSION_BROKEN , vwg::tls::TLSSESSION_CLOSED }

  Defines the possible status values of the session.

Variables

- const int vwg::tls::TLS_EOF = 0

  Defines the EOF value 0 in case that the connection is closed. This can happen if a closed on a socket is made and there are pending receive and send. Please be aware of that EOF is defined as -1.

9.19 TLSSession.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_TLSSESSION_H_
00005 #define SRC_TLSSESSION_H_
00006
00007
00008 #include <functional>
00009 #include <string>
00010 #include <memory>
00011
00012 #include "TLSApiTypes.h"
00013 #include "vwgtypes.h"
00014 #include "TLSReturnCodes.h"
00015 #include "vwgtypes.h"
00016
00017 using namespace vwg::types;
00018
00019
00020 namespace vwg
00021 {
00022 namespace tls
00023 {
00024 enum TLSDropStatus : UInt32 {
00025     TLSDROP_SECURED,
00026     TLSDROP_DROPPED,
00027     TLSDROP_REQUESTED,
00028     TLSDROP_SEND_LOCKED,
00029     TLSDROP_PERFORMED
00030 };
00031
00035 enum TLSSessionStatus : UInt32 {
00040     TLSSESSION_SECURED,
00041
00046     TLSSESSION_UNSECURED,
```

```
00047
00051     TLSSESSION_BROKEN,
00052
00056     TLSSESSION_CLOSED
00057
00058 };
00059
00065 const int TLS_EOF = 0;
00066
00067
00068 class ITLSSessionEndpoint;
00069
00070 using SPITLSSessionEndpoint = std::shared_ptr<ITLSSessionEndpoint>;
00071
00072
00076 using TLSSessionStatusListener = std::function<void(SPITLSSessionEndpoint endpoint, const
       TLSSessionStatus status)>;
00077
00078
00082 using TLSDropStatusListener = std::function<void(SPITLSSessionEndpoint endpoint, const TLSDropStatus
       status)>;
00083
00095 class ITLSSessionEndpoint : public ITLSSocketBase
00096 {
00097 public:
00098     ITLSSessionEndpoint() = default;
00099
00100     virtual ~ITLSSessionEndpoint() = default;
00101
00102
00103 public:
00104     /* ------------ write functions--------------------- */
00105
00118     virtual Int32 send(const Byte b[], const Int32 len) = 0;
00119
00133     virtual Int32 send(const Byte b[], const UInt32 offset, const Int32 len) = 0;
00134
00142     virtual Int32 flush() = 0;
00143
00144     /* ------------ read functions--------------------- */
00145
00152     virtual Int32 available() = 0;
00153
00166     virtual Int32 receive(Byte b[], const Int32 len) = 0;
00167
00180     virtual Int32 receive(Byte b[], const UInt32 offset, const Int32 len) = 0;
00181
00187     virtual TLSReturnCodes setBlocking(bool blocking) = 0;
00188
00194     virtual int getSocketFD() = 0;
00195
00202     virtual TLSReturnCodes shutdown() = 0;
00203
00209     virtual std::string getLocalDomainName() = 0;
00210
00216     virtual std::string getRemoteDomainName() = 0;
00217
00223     virtual UInt16 getRemotePort() = 0;
00224
00230     virtual SPIInetAddress getRemoteInetAddress() = 0;
00231
00232 #ifdef TLSAPI_WITH_DROP_SUPPORT
00240     virtual Boolean isDroppable() = 0;
00241
00250     virtual TLSReturnCodes dropTLS() = 0;
00251 #endif
00252
00258     virtual TLSDropStatus getDropState() = 0;
00259
00260
00267     virtual void setSessionStatusListener(TLSSessionStatusListener listener) = 0;
00268
00273     virtual void setDropStatusListener(TLSDropStatusListener listener) = 0;
00274 };
00275
00276 using SPTLSSessionEndpoint     = std::shared_ptr<ITLSSessionEndpoint>;
00277 using TLSSessionEndpointResult = TLSResult<SPTLSSessionEndpoint>;
00278
00279 } /* namespace tls */
00280 } /* namespace vwg */
00281
00282 #endif /* SRC_TLSSESSION_H_ */
```

9.20 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tlsAPI/includes/TLSSocketFactory.h File Reference

```
#include <memory>
#include <vector>
#include "vwgtypes.h"
#include "TLSApiTypes.h"
#include "TLSSession.h"
#include "TLSSockets.h"
#include "IOStream.h"
#include "CipherSuitesDefenitions.h"
```

Classes

- class vwg::tls::ITLSSocketFactory

  This is the interface of the socket factory. One need to get an instance of this interface to create a server or a client socket. Use the function initTLSLib to get the instance of the factory. The implementation will have only one instance of the factory.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::ClientCertificateSetID = std::string
- using vwg::tls::HashSha256 = std::vector< char >
- using vwg::tls::CertStoreID = std::string
- using vwg::tls::ITLSSocketFactoryResult = TLSResult< std::shared_ptr< ITLSSocketFactory > >

Variables

- const ClientCertificateSetID vwg::tls::CLINET_CERTICATE_SET_BASE = "BASE"

9.21 TLSSocketFactory.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019, 2020 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004
00005 #ifndef SRC_TLSSOCKETFACTORY_H_
00006 #define SRC_TLSSOCKETFACTORY_H_
00007
00008
00009 #include <memory>
00010 #include <vector>
00011
00012 #include "vwgtypes.h"
00013 #include "TLSApiTypes.h"
00014 #include "TLSSession.h"
00015 #include "TLSSockets.h"
00016 #include "IOStream.h"
00017 #include "CipherSuitesDefenitions.h"
00018
00019 namespace vwg
00020 {
00021 namespace tls
00022 {
00023 using ClientCertificateSetID                          = std::string;
00024 const ClientCertificateSetID CLINET_CERTICATE_SET_BASE = "BASE";
00025 using HashSha256                                      = std::vector<char>;
00026 using CertStoreID                                     = std::string;
00027
00028
00035 class ITLSSocketFactory
00036 {
00037 public:
00038     ITLSSocketFactory()          = default;
00039     virtual ~ITLSSocketFactory() = default;
00040
00041 public:
00047     virtual ApiVersionType getApiVersion() = 0;
00048
00100     virtual TLSServerSocketResult createServerSocket(SPIInetAddress      inet,
00101                                                      const UInt16        port,
00102                                                      const std::string   localDomainName,
00103                                                      const SecurityLevel securityLevel,
00104                                                      const SocketType    socketType =
      SOCKETTYPE_STREAM) = 0;
00105
00153     virtual TLSSessionEndpointResult createPskServerSession(int                 connectionFd,
00154                                                              const std::string   localDomainName,
00155                                                              const SecurityLevel confidentiality) = 0;
00156
00203     virtual TLSServerSocketResult createServerSocket(int                 fd,
00204                                                      const std::string   localDomainName,
00205                                                      const SecurityLevel confidentiality) = 0;
00206
00255     virtual TLSClientSocketResult createClientSocket(SPIInetAddress      inet,
00256                                                      const UInt16        port,
00257                                                      const std::string   localDomainName,
00258                                                      const SecurityLevel confidentiality,
00259                                                      const SocketType    socketType =
      SOCKETTYPE_STREAM) = 0;
00260
00303     virtual TLSClientSocketResult createClientSocket(int                 fd,
00304                                                      const std::string   localDomainName,
00305                                                      const SecurityLevel confidentiality) = 0;
00306
00403     virtual TLSClientSocketResult createTlsClient(const std::shared_ptr<IOStream> stream,
00404                                                   const std::string&               hostName,
00405                                                   const CertStoreID&               certStoreId,
00406                                                   const ClientCertificateSetID&
      clientCertificateSetID,
00407                                                   const CipherSuiteIds&            cipherSuiteIds,
00408                                                   const TimeCheckTime&             checkTime,
00409                                                   const std::vector<HashSha256>&
      httpPublicKeyPinningHashs,
00410                                                   const bool
      revocationCheckEnabled = false) = 0;
00411
00505     virtual TLSClientSocketResult createTlsClient(
00506             const TLSConnectionSettings &connectionSettings,
00507             const std::shared_ptr<IOStream> stream,
00508             const std::string& hostName,
00509             const CertStoreID& certStoreId,
00510             const ClientCertificateSetID &clientCertificateSetID,
00511             const TimeCheckTime& checkTime,
```

```
00512            const std::vector<HashSha256>& httpPublicKeyPinningHashs,
00513            const bool revocationCheckEnabled = false) noexcept = 0;
00514
00519     #ifdef TLSAPI_WITH_DROP_SUPPORT
00520
00577    virtual TLSServerSocketResult createDroppableServerSocket(SPIInetAddress      inet,
00578                                                               const UInt16        port,
00579                                                               const std::string   localDomainName,
00580                                                               const SecurityLevel securityLevel,
00581                                                               const SocketType    socketType =
     SOCKETTYPE_STREAM) = 0;
00582
00632    virtual TLSServerSocketResult createDroppableServerSocket(int           fd,
00633                                                               std::string   localDomainName,
00634                                                               SecurityLevel confidentiality) = 0;
00635
00689    virtual TLSClientSocketResult createDroppableClientSocket(SPIInetAddress      inet,
00690                                                               const UInt16        port,
00691                                                               const std::string   localDomainName,
00692                                                               const SecurityLevel securityLevel,
00693                                                               const SocketType    socketType =
     SOCKETTYPE_STREAM) = 0;
00694
00745    virtual TLSClientSocketResult createDroppableClientSocket(int           fd,
00746                                                               std::string   localDomainName,
00747                                                               SecurityLevel confidentiality) = 0;
00748
00800    virtual TLSClientSocketResult createDroppableClientSocket(std::shared_ptr<IOStream> stream,
00801                                                               std::string
     localDomainName,
00802                                                               SecurityLevel
     confidentiality) = 0;
00803
00804 #endif
00805 };
00806
00807
00808 using ITLSSocketFactoryResult = TLSResult<std::shared_ptr<ITLSSocketFactory>>;
00809
00810 } /* namespace tls */
00811 } /* namespace vwg */
00812
00813 #endif /* SRC_TLSSOCKETFACTORY_H_ */
```

9.22 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tls↩ API/includes/TLSSockets.h File Reference

```
#include <memory>
#include "vwgtypes.h"
#include "TLSApiTypes.h"
#include "TLSResult.h"
#include "TLSSession.h"
```

Classes

- class vwg::tls::ITLSServerSocket

  Server TLS-PSK aware server socket interface. This interface must be implemented by the supplier.
- class vwg::tls::ITLSClientSocket

  Server TLS-PSK aware client socket interface. This interface must be implemented by the supplier.

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::tls

Typedefs

- using vwg::tls::SPTLSClientSocket = std::shared_ptr< ITLSClientSocket >
- using vwg::tls::SPTLSServerSocket = std::shared_ptr< ITLSServerSocket >
- using vwg::tls::TLSClientSocketResult = TLSResult< SPTLSClientSocket >
- using vwg::tls::TLSServerSocketResult = TLSResult< SPTLSServerSocket >

9.23 TLSSockets.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_TLSSOCKETS_H_
00005 #define SRC_TLSSOCKETS_H_
00006
00007 #include <memory>
00008
00009 #include "vwgtypes.h"
00010 #include "TLSApiTypes.h"
00011 #include "TLSResult.h"
00012 #include "TLSSession.h"
00013
00014 using namespace vwg::types;
00015
00016 namespace vwg
00017 {
00018 namespace tls
00019 {
00033 class ITLSServerSocket : public ITLSSocketBase
00034 {
00035 public:
00036     ITLSServerSocket()          = default;
00037     virtual ~ITLSServerSocket() = default;
00038
00039 public:
00051     virtual TLSSessionEndpointResult accept() = 0;
00052
00058     virtual void setSoTimeout(Int32 timeout) = 0;
00059
00065     virtual int getSocketFD() = 0;
00066 };
00067
00068
00082 class ITLSClientSocket : public ITLSSocketBase
00083 {
00084 public:
00085     ITLSClientSocket() = default;
00086
00087     virtual ~ITLSClientSocket() = default;
00088
00089
00090 public:
00100     virtual TLSResult<std::shared_ptr<ITLSSessionEndpoint>> connect() = 0;
00101
00108     virtual void setSoTimeout(Int32 timeout) = 0;
00109
00115     virtual int getSocketFD() = 0;
00116 };
00117
00118
00119 using SPTLSClientSocket     = std::shared_ptr<ITLSClientSocket>;
00120 using SPTLSServerSocket     = std::shared_ptr<ITLSServerSocket>;
00121 using TLSClientSocketResult = TLSResult<SPTLSClientSocket>;
00122 using TLSServerSocketResult = TLSResult<SPTLSServerSocket>;
00123
00124
00125 } /* namespace tls */
00126 } /* namespace vwg */
00127
00128 #endif /* SRC_TLSSOCKETS_H_ */
```

9.24 /repos/crypto/tlsapi/release/e3_security_tlsapi/tlsAPI-WS/tls↩ API/includes/vwgtypes.h File Reference

```
#include <cstdint>
#include <array>
```

Namespaces

- namespace vwg

  *This is the entry point of the library, basically one user have to call **initTLSLib** to create a factory in order to retrieve the objects for the communication between provider and consumer.*
- namespace vwg::types

Typedefs

- using vwg::types::Boolean = bool
- typedef std::uint8_t vwg::types::UInt8
- typedef std::uint16_t vwg::types::UInt16
- typedef std::uint32_t vwg::types::UInt32
- typedef std::uint64_t vwg::types::UInt64
- typedef std::int8_t vwg::types::Int8
- typedef std::int16_t vwg::types::Int16
- typedef std::int32_t vwg::types::Int32
- typedef std::int64_t vwg::types::Int64
- using vwg::types::Byte = UInt8
- using vwg::types::UUID = std::array< UInt8, 16 >

9.25 vwgtypes.h

Go to the documentation of this file.

```
00001 /*
00002  * Copyright (c) 2019 Volkswagen AG (EES). All Rights Reserved.
00003  */
00004 #ifndef SRC_VWGTYPES_H_
00005 #define SRC_VWGTYPES_H_
00006
00007 #include <cstdint>
00008 #include <array>
00009
00010 namespace vwg {
00011 namespace types {
00012
00013 using  Boolean =  bool;
00014 typedef std::uint8_t UInt8;
00015 typedef std::uint16_t UInt16;
00016 typedef std::uint32_t UInt32;
00017 typedef std::uint64_t UInt64;
00018
00019
00020 typedef std::int8_t Int8;
00021 typedef std::int16_t Int16;
00022 typedef std::int32_t Int32;
00023 typedef std::int64_t Int64;
00024
00025 using Byte =  UInt8;
00026
00027
```

```
00028 using UUID = std::array<UInt8, 16>;
00029
00030
00031 } // namespace stdtypes
00032 } // namespace vwg
00033
00034
00035
00036 #endif /* SRC_VWGTYPES_H_ */
```

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