Ng911CadIfLib Software Requirements Specification

(Software Version 1.1.0)

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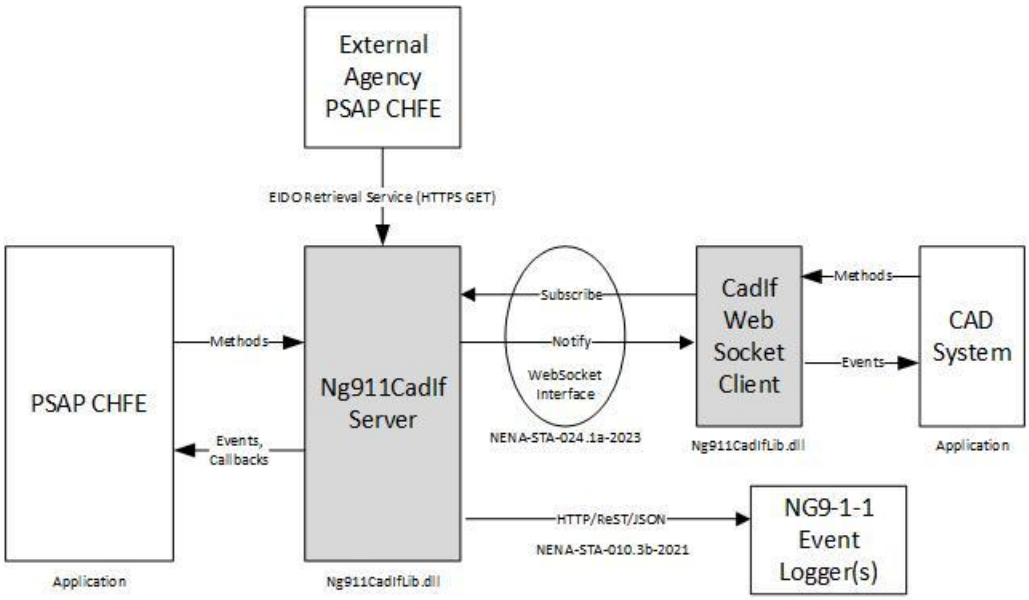
1 Introduction

This document is the Software Requirements Specification (SRS) for the Ng911CadIfLib class library.

The Ng911CadIfLib class library shall be a Microsoft .NET DLL class library that NG9-1-1 PSAP Call Handling Functional Element (CHFE) applications and Computer Aided Dispatch (CAD) systems can use for conveyance of Emergency Incident Data Objects (EIDOs). The following block diagram shows the interfaces between the PSAP CHFE, the Ng911CadIfServer class and a CAD System.



This class library shall provide two components shown in gray in the above figure. The Ng911CadIfServer class may be used by PSAP CHFE systems to implement the server side (or notifier) of the protocol defined in the document entitled Conveyance of Emergency Incident Data Objects (EIDOs) between Next Generation (NG 9-1-1) Systems and Applications (NENA-STA-024.1a-2023. The CadIfWebSocketClient class implements the client side (subscriber) of this protocol and may be used by CAD systems or other types of applications to receive EIDOs generated by a PSAP CHFE system.

The PSAP CHFE interacts with the Ng911CadIfServer class via API methods. The Ng911CadIfServer component uses events and asynchronous callbacks to notify the PSAP CHFE when certain events occur. The Ng911CadIfServer component implements the NENA EIDO conveyance subscribe/notify protocol specified in the NENA-STA-024.1a-2023 (see Reference 3). This protocol uses WEB Sockets (RFC 6455) as the transport mechanism.

The Emergency Incident Data Object (EIDO, see Reference 2) is a JSON document that contains all of the information about a 911 call. This information includes caller location, caller identity, and additional data about the call (such as subscriber information, information about the type of telephone service, information about the service provider and other data).

When the PSAP CHFE system answers a call, it creates an EIDO JSON object and sends it to the Ng911CadIfServer object via a method call.

The PSAP CHFE system may send updated EIDO objects to the Ng911CadIfServer object when the following events occur.

1. Updated call location information is received
2. Updated additional call related data is received
3. The call taker adds information to the call such as call taker notes or the call taker changes the incident type information
4. The call taker creates a conference, adds a party to the conference or transfers the call
5. The call is terminated

A CAD system will subscribe to receive EIDOs. When the Ng911CadIfServer receives an EIDO from the PSAP CHFE, it sends it to the CAD system via an event notify message.

The CadIfWebSocketClient class may be used by CAD systems or other types of systems that wish to receive EIDOs from PSAPs. This class implements the client (subscriber of the EIDO conveyance web socket transport protocol and provides an interface to a single EIDO provider such as a PSAP.

The CAD system interacts with the CadIfWebSocketClient class using .NET API methods and events. The CadIfWebSocketClient class communicates with an EIDO server such as a PSAP using the web socket EIDO conveyance. It subscribes to the EIDO server and maintains the subscription. When the EIDO server receives a new EIDO, it sends it to the CadIfWebSocketClient object via a notify message and the CadIfWebSocketClient sends the EIDO to the CAD system via an event.

1.1 References

1. NENA i3 Standard for Next Generation 9-1-1, NENA, NENA-STA-010.3b-2021, October 7, 2021.
2. NENA Standard for Emergency Incident Data Object (EIDO), NENA, NENA-STA-021.1a-2022, October 19, 2021.
3. Conveyance of Emergency Incident Data Objects (EIDOs) between Next Generation (NG 9-1-1) Systems and Applications, National Emergency Number Association (NENA), NENA-STA-024.1a-2023, February 21, 2023.

1.2 Glossary of Terms

Term	Description
API	Applications Programming Interface
CAD	Computer Aided Dispatch
CHFE	Call Handling Functional Element
EIDO	Emergency Incident Data Object
ESInet	Emergency Services IP Network
NG9-1-1	Next Generation 9-1-1
PSAP	Public Service Answering Point

2 General Requirements

This section specifies the general requirements for the Ng911CadIfLib class library.

The intended use Ng911CadIfLib class library is to provide bridge between the PSAP CHFE and the CAD system within a single agency. The functionality that will be implemented in the Ng911CadIfLib class library is a subset of the more general requirements specified in NENA-STA-024.1a-2023.

2.1 Ng911CadIfServer Class Requirements

The Ng911CadIfServer class shall provide the server side of the Web Sockets interface specified in NENA-STA-024.1a-2023.

The Ng911CadIfServer class shall provide an interface between a single .NET application (such as a PSAP CHFE system) and multiple subscribers that implement the client side of the EIDO Web Sockets conveyance protocol specified in NENA-STA-024.1a-2023.

The Ng911CadIfServer class shall support interfaces to multiple NG9-1-1 Event Loggers. See Section 2.1.2.

The following table specifies which requirements from NENA-STA-024.1a-2023 that the Ng911CadIfLib class library is required to meet. The Section and Title columns pertain to NENA-STA-024.1a-2023.

Table 2.1 NENA-STA-024.1a-2023 Requirements Matrix

Section	Title	Supported?	Description
2.1.1	General Description	Partial	See Section 2.1.1 below for clarification
2.1.2	URI Scheme	Yes	
2.1.3.1.1	Negotiate Web Socket	Yes	
2.1.3.1.2	HTTP Headers	Yes	
2.1.4	Client Web Socket API Actions	NA	Not Applicable
2.1.5	Objects	Yes	
2.1.6	Notification Model	Yes	
2.2	Min Rates and Max Rates In Detail	Partial	Support for Min Rates shall be provided. Max Rates support is not required.
2.3	qualFilter	No	The intended use of the Ng911CadIfLib class library is for communication between a single agency's PSAP CHFE and that agency's CAD system so EIDO filtering will not be required.
2.4	Transport in Call Signaling	No	Not applicable
2.5	EIDO Dereference Factory	No	
2.6	EIDO Dereference Service	No	
2.7	EIDO Retrieval Service	Yes	
2.8	Data Rights Management	No	
2.9	Logging	Yes	
2.10	Security	Partial	TLS with mutual authentication using PCA issued certificates will be supported.

			Digital Right Management will not be supported.

2.1.1 Description of NENA-STA-024.1a-2023 General Requirements

See Section 2.1.1 of NENA-STA-024.1a-2023.

Table 2.2 General Requirements Matrix

Section 2.1.1 Requirement	Supported?	Description
The Ng911CadIfServer class shall support Mutual authentication with credentials traceable to the PSAP Credentialing Agency (PCA)	Yes	
For interoperability, all implementations SHALL accept subscription requests of any size up to and including 65,536 bytes.	Yes	
All communication related to a subscription is handled over the Web Socket.	Yes	
Upon successful subscription, notifications SHALL be sent to the subscriber as they match the criteria associated with the subscription until the subscription expires or client unsubscribes.	No	The Ng911CadIfServer class library does not need to support EIDO filtering.
The server shall accept subscriptions for new incidents or for a single incident.	Yes	
For a new incidents subscription, a notification SHALL be sent immediately that contains all active incidents that match the criteria.	Yes	
For a subscription for new incidents, if there are no EIDOs that match the criteria of the new subscription request, the server shall send an empty notification message.	Yes	
A Single Incident subscription SHALL be accepted for a closed incident if the request is made within five minutes of its closure, in which case a single EIDO representing the last state of that incident SHALL be sent and no further notifications will be made for that incident. The server shall only accept changes to a subscription that changes the expiration of the subscription.	No	The Ng911CadIfLib class library does not need to store EIDOs for closed incidents. The PSAP CHFE will store EIDOs.
Once established, a Web Socket SHALL handle multiple subscriptions.	No	Only a single subscription per Web Socket needs to be supported because EIDO filtering is not required. If the Ng911CadIfServer object receives a new subscription request when a subscription already exists, it shall terminate the existing

		subscription and accept the new subscription.
Upon expiration of the last subscription still in effect the server will close the Web Socket. It is up to the subscriber to detect this closure and act appropriately.	Yes	
If the Web Socket is closed (including if the underlying TCP socket is closed) then the server shall flush all subscriptions established using that Web Socket without notifying the subscriber.	Yes	

2.1.2 NG9-1-1 Logging Requirements

The Ng911CadIfServer class shall support NG9-1-1 log events as specified in Section 2.9 of NENA-STA-024.1a-2023. The following table specifies which log events the Ng911CadIfLib class library needs to support.

Table 2.3 Log Events Requirements Matrix

Section	Log Event Name	Supported?	Description
2.9.1	EidoLogEvent	Yes	
2.9.2	EidoDereferenceFactoryQueryLogEvent	No	Not required because the EIDO de-reference factory function is not required.
2.9.3	EidoDereferenceFactoryQueryResponseLogEvent	No	Not required because the EIDO de-reference factory function is not required.
2.9.4	EidoDeniedLogEvent	No	Not required because the EIDO dereference service function is not required.
2.9.5	EidoTransmissionErrorLogEvent	Yes	
2.9.6	SubscriptionRequestedLogEvent	Yes	
2.9.7	SubscriptionRequestedResponseLogEvent	Yes	
2.9.8	SubscriptionTerminatedLogEvent	Yes	
2.9.9	SubscriptionTerminatedResponseLogEvent	Yes	
2.9.10	WebSocketEstablishedLogEvent	Yes	
2.9.11	WebSocketTerminatedLogEvent	Yes	

2.2 CadIfWebSocketClient Class Requirements

The CadIfWebSocketClient class shall implement the client-side (subscriber) of the EIDO conveyance protocol.

This class shall establish and maintain a web socket connection to a single EIDO server.

If the CadIfWebSocketClient class cannot establish a web socket connection to the EIDO server it shall try again after 5 seconds and continue to connect until a connection is established or until it is shut down by the application.

The CadIfWebSocketClient class shall notify the application when the web socket connection state changes. See Section 4.3.1.

When the CadIfWebSocketClient class establishes a web socket connection to the server, it shall immediately subscribe to notification events from the EIDO server.

If the CadIfWebSocketClient is not able to establish a subscription to the server, it shall retry every 2 seconds until a subscription is established.

The CadIfWebSocketClient class shall notify the application when the subscription state changes. See Section 4.3.2.

The CadIfWebSocketClient class shall monitor the subscription state and re-subscribe 2 seconds before the current subscription expires. The application shall not be notified of re-subscription events.

If the EIDO server terminates the subscription, the CadIfWebSocketClient class will notify the application that the subscription was terminated (see Section 4.3.2), close the web socket (and notify the application) and then attempt to reconnect and re-subscribe.

When the CadIfWebSocketClient class receives an EIDO, it shall send the EIDO to the application in an event. See Section 4.3.3.

3 Interface to the PSAP CHFE

The interface between the PSAP CHFE and the Ng911CadIfServer component shall be a custom application programming interface. This section specifies the requirements for this interface.

The basic operational sequence is:

1. The PSAP CHFE creates a new Ng911CadIfServer object and passes it various configuration parameters
2. The PSAP CHFE hook the events of the Ng911CadIfServer object
3. The PSAP CHFE calls the Start() method of the Ng911CadIfServer object and the Ng911CadIfServer object starts listening for WEB Socket connection and subscription requests.
4. The PSAP CHFE sends new or updated EIDO objects to the Ng911CadIfServer object via the SendEido() method and the Ng911CadIfServer sends the EIDO objects to all subscribed CAD systems.

The Ng911CadIfServer runs for as long as the PSAP CHFE is running. When the PSAP CHFE is finished with the Ng911CadIfServer object, or when it is shutting down, the PSAP CHFE must call the Shutdown() method of the Ng911CadIfServer object so that it can perform an orderly shutdown (i.e., terminate all subscriptions and close all Web Socket connections).

3.1 Configuration Settings

The Ng911CadIfServer object shall accept the following configuration parameters.

Table 3.1 Configuration Settings

Setting Name	Type	Required?	Description
ServerCert	X509Certificate2	Yes	The certificate must contain a private key.
ServerEndPoint	IPEndPoint	Yes	Specifies the IP address and port number that the Ng911CadIfServer will listen on. The IP address may be IPAddress.Any, IPAddress.IPv6Any, an IPv4 or an IPv6 address.
WsPath	String	Yes	Specifies the path that clients will use to connect to the Ng911CadIfServer's Web Socket server. For example: /IncidentData/Ent[1].
HttpsEidoPath	String	Yes	Specifies the path that clients will use to access the EIDO Retrieval service. For example: /incidents/eidos.
LoggingInterface	I3LogEventClientMgr	Optional	Specifies the I3LogEventClientMgr object to use for sending NG9-1-1 log events. If this parameter is null then the Ng911CadIfServer object will not send

[1] If the path is /Ent, clients will use the following URI to connect to the Ng911CadIf server: wss://IPAddress:TcpPort/IncidentData/Ent.

			NG9-1-1 log events. If non-null, then the I3LogEventClientMgr object must be configured and running.
LoggingSettings	See Section 3.1.1	Conditional	Required if the Logging Interface setting is specified.
MutualAuthCallback	See Section 3.1.2	Optional	If specified (non-null), the Ng911CadIfServer object will call this delegate when a client attempts to connect to the Ng911CadIfServer object. If this callback delegate returns true, then the Ng911CadIfServer object will accept the connection, else it will reject the connection with a 401 Unauthorized response.
RetrievalCallback	See Section 3.1.3	Required	Specifies a callback for a function that the Ng911CadIfServer object will call to retrieve an EIDO from the application (PSAP CHFE) when a functional element (i.e. another PSAP system) attempts to retrieve an EIDO using the EIDO Retrieval Service interface of the Ng911CadIfServer object.

3.1.1 Logging Configuration Settings

The Ng911CadIfServer object shall accept the following configuration settings for NG9-1-1 event logging.

Table 3.2 NG9-1-1 Logging Configuration Settings

Setting Name	Type	Required?	Description
ElementId	String	Yes	Element identifier (Section 2.1.3 of NENA-STA-010.3) of the element that logged the event.
AgencyId	String	Yes	Agency identifier (Section 2.1.1 of NENA-STA-010.3) of the agency that logged the event.
AgencyAgentId	String	Optional	Agent identifier of the agent within the Agency.
AgencyPositionId	String	Optional	Identifier of the operator position that is handling the call.

3.1.2 Mutual Authentication Callback

The PSAP CHFE can provide a callback delegate that the Ng911CadIfServer object will call when a CAD system makes a Web Socket connection request. This callback delegate shall take the parameters shown in the following table and it shall return a Boolean value. The PSAP CHFE can use the information in these parameters to perform mutual authentication in order to determine whether or not to accept the connection request. If the PSAP CHFE decides to accept the connection, then it will return true. A return value of false indicates that the PSAP CHFE does not want to accept the connection request.

Table 3.3 Connection Request Callback Delegate Parameters

Parameter Type	Description
X509Certificate2	X.509 certificate of the client subscriber. Will be null if the client did not provide a certificate. If not null, the application can use the information in this object to determine whether or not to allow the connection request.
X509Chain	Contains the chain of certificate authorities associated with the remote certificate.
SslPolicyErrors	One or more errors associated with the remote certificate.

The connection request callback delegate parameter is optional. If it is null, then the Ng911CadIfServer object will accept all WEB Socket connection requests.

3.1.3 EIDO Retrieval Callback

The EIDO retrieval service is an HTTPS GET interface provided by the Ng911CadIfServer object. An external agency can use this interface to retrieve a single EIDO by de-referencing an HTTPS URI that was provided to it when a call was transferred to it. Section 4.7.4 of NENA-STA-010.3b-2021 describes how this URI is passed to an external agency during a call transfer/conference setup operation.

The PSAP system must provide a reference to a callback function to the Ng911CadIfServer object that the Ng911CadIfServer object will call to retrieve a specific EIDO when it receives an HTTPS GET request from an external agency.

The EIDO retrieval callback function shall take the following parameters.

Table 3.4 EIDO Retrieval Callback Function Parameters

Parameter Type	Description
String	Requested EIDO reference ID. This will be the last element of the request path.
X509Certificate2	X.509 certificate of the client. Will be null if the client did not provide a certificate. If not null, the application can use the information in this object to determine whether or not to provide the requested EIDO to the client.
IPEndPoint	IP endpoint that contains the IP address and port number of the remote client that is requesting the EIDO for a specific interface via an HTTPS GET request.
Integer32	Response code. This shall be an output parameter that the application provides. If the application returns an EidoType object, then the response code shall be 200 (OK). Otherwise, the response code should be set a value that indicates the error condition (for example 404 for not found).

The EIDO retrieval callback function shall return an EidoType object if the requested EIDO is found and the remote endpoint is permitted to retrieve the requested EIDO or null otherwise.

3.2 Methods

The Ng911CadIfServer class shall provide the following methods.

3.2.1 Start()

The PSAP CHFE software will call the Start() method to cause the Ng911CadIfServer object to start its HTTPS server listening for Web Socket requests. This method will have no parameters and will not have a return parameter.

The Start() method may throw exceptions if a configuration parameter is incorrect or some other error occurs. The specific exceptions thrown are TBD.

If the Ng911CadIfServer object has already been started then it will perform no action and return if this method is called.

3.2.2 Shutdown()

This method will cause the Ng911CadIfServer object to gracefully shut down. A graceful shut down requires that the Ng911CadIfServer object terminate all current subscriptions and to close all Web Socket connections.

This method will have no return value and it will take no parameters.

If the Ng911CadIfServer object has not been started yet or if it has already been shut down, then this method will return without performing any actions.

3.2.3 SendEido()

This method will be called by the PSAP CHFE when it creates a new EIDO document or updates an existing EIDO document. The Ng911CadIfServer object will send the EIDO document object to all subscribed CAD systems.

The SendEido() method shall have the following input parameters and it will not have a return value.

Table 3.5 SendEido() Method Parameters

Parameter Type	Description
EidoType	EIDO object to send to all subscribers.

The Ng911CadIfServer object shall queue EIDOs for each subscriber and it shall and return immediately. When the Ng911CadIfServer object sends an EIDO to a CAD system, it shall wait for the CAD system to acknowledge receipt of that EIDO.

3.2.4 SendEidosToSubscriber()

This method will be called by the PSAP CHFE to send a list of EIDOs to a specific subscriber (CAD system) when a new subscription request has been accepted.

Table 3.6 SendEidosToSubscriber() Method Parameters

Parameter Type	Description
String	Subscription ID of the subscriber to send the latest EIDOs for open incidents to. This parameter must be set to the SubscriptionId parameter from the NewSubscription event.
List<EidoType>	EIDO object to send to all subscribers.

The PSAP CHFE shall only call this method when it receives the NewSubscription event.

If the subscription ID does not exist then the Ng911CadIfServer object shall perform no action.

The Ng911CadIfServer object shall queue EIDOs for each subscriber and it shall and return immediately. When the Ng911CadIfServer object sends an EIDO to a CAD system, it shall wait for the CAD system to acknowledge receipt of that EIDO.

3.3 Events

3.3.1 NewSubscription

The Ng911CadIfServer object shall fire this event when it accepts a new subscription from a CAD system. The PSAP CHFE can then use the parameters received with this event to send EIDOs for all active incidents to only the newly subscribed CAD system using the SendEidosToSubscriber().

Table 3.7 NewSubscription Event Parameters

Parameter Name	Parameter Type	Description
SubscriptionId	String	Subscription ID for the new subscription.
strIdType	String	Identifies the type of functional element that subscribed to receive EIDO notification events. This information is from the idType field of the other name field of the SubjectAltName of the client X.509 certificate that was issued by the PSAP Credentialing Agency (PSAP). This parameter will be null if no client certificate was received with the Web Socket connection request or if the client certificate was not issued by the PCA. The allowed values for this parameter are: ElementId, ServiceId, AgencyId or CaId.
strId	String	Identifies the functional element that subscribed to receive EIDO notification events. This information is from the id field of the other name field of the SubjectAltName of the client X.509 certificate that was issued by the PSAP Credentialing Agency (PCA). This parameter will be null if no client certificate was received with the Web Socket connection request or if the client certificate was not issued by the PCA.
RemIpe	IPEndPoint	IP endpoint of the subscriber. The IPEndPoint contains the IP address and port number of the subscriber.

3.3.2 SubscriptionEnded

The Ng911CadIfServer object shall fire this event when it detects that a subscription has terminated. The following table specifies the parameters of this event.

The Ng911CadIfServer object shall consider a subscription terminated when one of the following events occur.

1. The subscriber unsubscribes by sending an “unsubscribe” message.
2. The subscription was terminated by the Ng911CadIfServer object because it expired.
3. The Web Socket connect was either closed by the client or was terminated abnormally.

The Ng911CadIfServer object shall not fire this event when the PSAP CHFE system calls the Shutdown() method.

Table 3.8 SubscriptionEnded Event Parameters

Parameter Name	Parameter Type	Description
SubscriptionId	String	Subscription ID for the new subscription.
IdType	String	Identifies the type of functional element that subscribed to receive EIDO notification events. This information is from the idType field of the other name field of the SubjectAltName of the client X.509 certificate that was issued by the PSAP Credentialing Agency (PSAP). This parameter will be null if no client certificate was received with the Web Socket connection request or if the client certificate was not issued by the PCA. The allowed values for this parameter are: ElementId, ServiceId, AgencyId or CaId.
strId	String	Identifies the functional element that subscribed to receive EIDO notification events. This information is from the id field of the other name field of the SubjectAltName of the client X.509 certificate that was issued by the PSAP Credentialing Agency (PSAP). This parameter will be null if no client certificate was received with the Web Socket connection request or if the client certificate was not issued by the PCA.
RemIpe	IPEndPoint	IP endpoint of the subscriber. The IPEndPoint contains the IP address and port number of the subscriber.
strReason	String	Indicates the reason that the subscription was terminated. For example: “Unsubscribed”, “Expired” or “Disconnected”.

3.3.3 Events for Testing

The Ng911CadIfServer class shall provide the following events for testing purposes. An application is not normally expected to use these events.

3.3.3.1 WssConnectionAccepted

The Ng911CadIfServer class shall fire this event when it accepts a Web Socket connection.

Table 3.9 WssConnectionAccepted Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client that requested the connection.
String	SubProtocol	Web Socket sub-protocol. May be null if not provided by the client.
ClientCertificate	X509Certificate2	The client's X.509 certificate. May be null if the client did not provide a certificate.

3.3.3.2 WssConectionEnded

The Ng911CadIfServer class shall fire this event when a Web Socket connection has ended.

Table 3.10 WssConnectionEnded Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client.

3.3.3.3 WssMessageReceived

The Ng911CadIfServer class shall fire this event when it receives an EIDO conveyance protocol message.

Table 3.11 WssMessageReceived Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client.
JsonString	String	JSON message that was received.

3.3.3.4 WssMessageSent

The Ng911CadIfServer class shall fire this event when it sends an EIDO conveyance protocol message.

Table 3.12 WssMessageSent Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client.
JsonString	String	JSON message that was sent

3.3.3.5 EidoRequestReceived

The Ng911CadIfServer class shall fire this event when it receives an HTTPS GET request for an EIDO.

Table 3.13 EidoRequestReceived Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client.
RequestPath	String	Path parameter from the GET request.
ClientCertificate	X509Certificate2	The client's X.509 certificate. May be null if the client did not provide a certificate.

3.3.3.6 EidoResponseSent

The Ng911CadIfServer class shall fire this event when it sends a response to an HTTPS GET request for an EIDO.

Table 3.14 EidoResponseSent Event Parameters

Parameter Name	Parameter Type	Description
RemIpe	IPEndPoint	Endpoint of the client.
ResponseCode	int	HTTP response code that was sent.
eido	EidoType	EIDO document that was sent. Will be null if the ResponseCode is not 200.

4 Client-Side Interface Requirements

This section specifies the API requirements for the CadIfWebSocketClient class.

4.1 Constructor Parameters

The CadIfWebSocketClient shall take the following configuration parameters in its constructor.

Parameter Name	Parameter Type	Description
clientCertificate	X509Certificate2	Optional. X.509 certificate for this client if the server is using secure web sockets (WSS) and if the server is known to authenticate clients (mutual authentication). This parameter may be null if the server is known to not authenticate clients. This parameter may be non-null even if not using WSS with mutual authentication.
validationCallback	RemoteCertificateValidationCallback	Optional. Specifies a user-provider callback function that will be called by the TLS handshake if using WSS that allows the application to validate the EIDO server's X.509 certificate. If null, then the CadIfWebSocketClient class shall use a default callback that accepts all certificates.
strUri	String	Specifies the WS or WSS URI of the server.
expiresSeconds	int	Specifies the expiration time of the subscription to the server in seconds.

4.2 Methods

The CadIfWebSocketClient class shall provide the following methods.

4.2.1 Start()

This method shall initiate a web socket connection to the EIDO server. When the web socket connection is established, the CadIfWebSocketClient class shall send a subscribe message to the EIDO server.

If the application calls this method a second time the CadIfWebSocketClient shall ignore the request.

4.2.2 Shutdown()

This method shall terminate the subscription to the EIDO server if subscribed and close the web socket connection. The application shall call this method when it is shutting down.

4.3 Events

4.3.1 CadIfConnectionState

The CadIfWebSocketClient class shall fire this event when the state of the web socket connection to the EIDO server changes state. This event shall take the following parameters.

Parameter Name	Parameter Type	Description
IsConnected	bool	If true then the web socket connection to the server has been established. If false, then the web socket connection could not be established or it was established and then lost.
strServerUri	string	WS or WSS URI of the server.

4.3.2 CadIfSubscriptionState

The CadIfWebSocketClient class shall fire this event when the state of the subscription to the EIDO server changes state. The CadIfWebSocketClient class shall not fire this event when it periodically renews the subscription.

This event shall take the following parameters.

Parameter Name	Parameter Type	Description
IsSubscribed	bool	If true then this class successfully subscribed to the EIDO server. If false, then a subscription could not be established or the subscription was terminated by the server.
strServerUri	string	WS or WSS URI of the server.

4.3.3 EidoReceived

The CadIfWebSocketClient class shall fire this event when it receives a notify message from the EIDO server containing a new EIDO object. This event shall take the following parameters.

Parameter Name	Parameter Type	Description
eido	EidoType	EIDO that was received.
strServerUri	string	WS or WSS URI of the server.

Revision History

Revision	Date	By	Description
1.0.0	7 Jun 23	PHR	Initial version
1.1.0	25 Feb 25	PHR	Added the CadIfWebSocketClient class. This version if for version 1.1.0 of the Ng911CadIfLib DLL.