

QSense Sidecar Library
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Contents

1	QSense Sidecar Library	1
1.1	Contents	1
1.2	Overview	1
1.3	Workflow	1
1.4	Initialisation	2
1.4.1	Simple Arduino API	2
1.4.1.1	Provisioning API	2
1.4.1.2	Event API	2
1.4.2	Core API	2
1.5	Publish Sensor Data	3
1.5.1	Simple Arduino API	3
1.5.2	Core API	3
1.6	Libraries	3
2	Namespace Index	5
2.1	Namespace List	5
3	Hierarchical Index	7
3.1	Class Hierarchy	7
4	Class Index	9
4.1	Class List	9
5	File Index	11
5.1	File List	11
6	Namespace Documentation	13
6.1	qsense Namespace Reference	13
6.1.1	Detailed Description	14
6.1.2	Typedef Documentation	14
6.1.2.1	Byte	14
6.1.2.2	QString	14
6.1.3	Function Documentation	14

6.1.3.1	operator<<	14
6.1.3.2	operator<<	14
6.1.3.3	operator<<	14
6.1.3.4	swap	14
6.2	qsense::hash Namespace Reference	14
6.2.1	Detailed Description	15
6.3	qsense::hash::base64 Namespace Reference	15
6.3.1	Detailed Description	15
6.3.2	Function Documentation	15
6.3.2.1	decode	15
6.3.2.2	decodeLength	15
6.3.2.3	encode	15
6.3.2.4	encodeLength	15
6.4	qsense::net Namespace Reference	15
6.4.1	Detailed Description	16
6.4.2	Enumeration Type Documentation	16
6.4.2.1	NetworkType	16
6.4.3	Function Documentation	16
6.4.3.1	initNetworkType	16
6.4.3.2	millis	16
7	Class Documentation	17
7.1	qsense::AutoPtr< C > Class Template Reference	17
7.1.1	Detailed Description	19
7.1.2	Constructor & Destructor Documentation	19
7.1.2.1	AutoPtr	19
7.1.2.2	AutoPtr	19
7.1.2.3	AutoPtr	19
7.1.2.4	AutoPtr	20
7.1.2.5	AutoPtr	20
7.1.2.6	~AutoPtr	20
7.1.3	Member Function Documentation	20
7.1.3.1	assign	20
7.1.3.2	assign	20
7.1.3.3	assign	20
7.1.3.4	assign	20
7.1.3.5	cast	20
7.1.3.6	duplicate	21
7.1.3.7	get	21
7.1.3.8	get	21

7.1.3.9	isNull	21
7.1.3.10	operator C *	21
7.1.3.11	operator const C *	21
7.1.3.12	operator"	21
7.1.3.13	operator"!=	21
7.1.3.14	operator"!=	21
7.1.3.15	operator"!=	21
7.1.3.16	operator*	21
7.1.3.17	operator*	21
7.1.3.18	operator->	22
7.1.3.19	operator->	22
7.1.3.20	operator<	22
7.1.3.21	operator<	22
7.1.3.22	operator<	22
7.1.3.23	operator<=	22
7.1.3.24	operator<=	22
7.1.3.25	operator<=	22
7.1.3.26	operator=	22
7.1.3.27	operator=	22
7.1.3.28	operator=	22
7.1.3.29	operator==	22
7.1.3.30	operator==	22
7.1.3.31	operator==	23
7.1.3.32	operator>	23
7.1.3.33	operator>	23
7.1.3.34	operator>	23
7.1.3.35	operator>=	23
7.1.3.36	operator>=	23
7.1.3.37	operator>=	23
7.1.3.38	swap	23
7.1.3.39	unsafeCast	23
7.2	qsense::ByteOrder Class Reference	23
7.2.1	Detailed Description	24
7.2.2	Member Function Documentation	24
7.2.2.1	flipBytes	24
7.2.2.2	flipBytes	24
7.2.2.3	flipBytes	24
7.2.2.4	flipBytes	24
7.2.2.5	flipBytes	24
7.2.2.6	flipBytes	24

7.2.2.7	fromBigEndian	24
7.2.2.8	fromBigEndian	24
7.2.2.9	fromBigEndian	24
7.2.2.10	fromBigEndian	25
7.2.2.11	fromBigEndian	25
7.2.2.12	fromBigEndian	25
7.2.2.13	fromLittleEndian	25
7.2.2.14	fromLittleEndian	25
7.2.2.15	fromLittleEndian	25
7.2.2.16	fromLittleEndian	25
7.2.2.17	fromLittleEndian	25
7.2.2.18	fromLittleEndian	25
7.2.2.19	fromNetwork	25
7.2.2.20	fromNetwork	25
7.2.2.21	fromNetwork	25
7.2.2.22	fromNetwork	25
7.2.2.23	fromNetwork	25
7.2.2.24	fromNetwork	25
7.2.2.25	toBigEndian	25
7.2.2.26	toBigEndian	25
7.2.2.27	toBigEndian	25
7.2.2.28	toBigEndian	25
7.2.2.29	toBigEndian	25
7.2.2.30	toBigEndian	25
7.2.2.31	toLittleEndian	25
7.2.2.32	toLittleEndian	25
7.2.2.33	toLittleEndian	25
7.2.2.34	toLittleEndian	25
7.2.2.35	toLittleEndian	25
7.2.2.36	toLittleEndian	25
7.2.2.37	toNetwork	25
7.2.2.38	toNetwork	26
7.2.2.39	toNetwork	26
7.2.2.40	toNetwork	26
7.2.2.41	toNetwork	26
7.2.2.42	toNetwork	26
7.3	qsense::hash::Sha1::Context Struct Reference	26
7.3.1	Detailed Description	26
7.3.2	Member Data Documentation	26
7.3.2.1	buffer	26

7.3.2.2	ipad	26
7.3.2.3	opad	26
7.3.2.4	state	26
7.3.2.5	total	27
7.4	qsense::net::DateTime Class Reference	27
7.4.1	Detailed Description	27
7.4.2	Constructor & Destructor Documentation	27
7.4.2.1	DateTime	27
7.4.3	Member Function Documentation	27
7.4.3.1	currentTime	27
7.4.3.2	currentTimeMillis	27
7.4.3.3	date	28
7.4.3.4	singleton	28
7.5	qsense::Event Class Reference	28
7.5.1	Detailed Description	29
7.5.2	Member Typedef Documentation	29
7.5.2.1	KeyTags	29
7.5.2.2	KeyTagsIterator	29
7.5.2.3	Readings	30
7.5.2.4	ReadingsIterator	30
7.5.2.5	Tags	30
7.5.2.6	TagsIterator	30
7.5.3	Constructor & Destructor Documentation	30
7.5.3.1	Event	30
7.5.3.2	Event	30
7.5.3.3	~Event	30
7.5.4	Member Function Documentation	30
7.5.4.1	add	30
7.5.4.2	add	30
7.5.4.3	add	30
7.5.4.4	beginKeyTags	30
7.5.4.5	beginReadings	31
7.5.4.6	beginTags	31
7.5.4.7	endKeyTags	31
7.5.4.8	endReadings	31
7.5.4.9	endTags	31
7.5.4.10	getLocation	31
7.5.4.11	init	31
7.5.4.12	numberOfKeyTags	31
7.5.4.13	numberOfReadings	31

7.5.4.14	numberOfTags	31
7.5.4.15	operator+=	31
7.5.4.16	operator+=	32
7.5.4.17	operator[]	32
7.5.4.18	toString	32
7.6	qsense::net::HttpClient Class Reference	32
7.6.1	Detailed Description	34
7.6.2	Member Typedef Documentation	34
7.6.2.1	Ptr	34
7.6.3	Constructor & Destructor Documentation	34
7.6.3.1	HttpClient	34
7.6.3.2	~HttpClient	34
7.6.4	Member Function Documentation	34
7.6.4.1	connect	34
7.6.4.2	connected	34
7.6.4.3	create	34
7.6.4.4	get	34
7.6.4.5	post	35
7.6.4.6	readBody	35
7.6.4.7	readHeaders	35
7.6.4.8	readLine	35
7.6.4.9	remove	35
7.6.4.10	writeHeaders	36
7.7	qsense::net::HttpRequest Class Reference	36
7.7.1	Detailed Description	37
7.7.2	Member Typedef Documentation	37
7.7.2.1	Iterator	37
7.7.2.2	Map	37
7.7.3	Constructor & Destructor Documentation	37
7.7.3.1	HttpRequest	37
7.7.3.2	~HttpRequest	37
7.7.4	Member Function Documentation	37
7.7.4.1	beginHeaders	37
7.7.4.2	endHeaders	37
7.7.4.3	getBody	37
7.7.4.4	getParamters	38
7.7.4.5	getUri	38
7.7.4.6	setBody	38
7.7.4.7	setHeader	38
7.7.4.8	setParameter	38

7.8	qsense::Location Class Reference	38
7.8.1	Detailed Description	39
7.8.2	Constructor & Destructor Documentation	39
7.8.2.1	Location	39
7.8.2.2	Location	39
7.8.2.3	Location	39
7.8.2.4	~Location	39
7.8.3	Member Function Documentation	39
7.8.3.1	getLatitude	39
7.8.3.2	getLongitude	39
7.8.3.3	operator=	39
7.8.3.4	toString	39
7.9	qsense::hash::MD5 Class Reference	40
7.9.1	Detailed Description	40
7.9.2	Member Typedef Documentation	40
7.9.2.1	Byte	40
7.9.2.2	Word	40
7.9.3	Constructor & Destructor Documentation	40
7.9.3.1	MD5	40
7.9.3.2	~MD5	40
7.9.4	Member Function Documentation	40
7.9.4.1	compute	40
7.9.4.2	compute	41
7.10	qsense::Reading Class Reference	41
7.10.1	Detailed Description	41
7.10.2	Constructor & Destructor Documentation	41
7.10.2.1	Reading	41
7.10.2.2	Reading	42
7.10.2.3	~Reading	43
7.10.3	Member Function Documentation	43
7.10.3.1	getKey	43
7.10.3.2	getTimestamp	43
7.10.3.3	getValue	43
7.10.3.4	toString	43
7.11	qsense::RefCountedObject Class Reference	43
7.11.1	Detailed Description	44
7.11.2	Constructor & Destructor Documentation	44
7.11.2.1	RefCountedObject	44
7.11.2.2	~RefCountedObject	44
7.11.3	Member Function Documentation	44

7.11.3.1	duplicate	44
7.11.3.2	referenceCount	44
7.11.3.3	release	44
7.12	qsense::hash::Sha1 Class Reference	45
7.12.1	Detailed Description	45
7.12.2	Constructor & Destructor Documentation	45
7.12.2.1	Sha1	45
7.12.2.2	~Sha1	45
7.12.3	Member Function Documentation	45
7.12.3.1	hash	45
7.12.3.2	hash	46
7.12.3.3	hmac	46
7.12.3.4	hmac	46
7.12.3.5	sign	46
7.13	qsense::net::SidecarClient Class Reference	46
7.13.1	Detailed Description	47
7.13.2	Member Function Documentation	47
7.13.2.1	authenticate	47
7.13.2.2	createOrRetrieveAccessKeys	47
7.13.2.3	createUser	48
7.13.2.4	deleteUser	48
7.13.2.5	initAPIKey	48
7.13.2.6	initUserKey	48
7.13.2.7	publish	48
7.14	SimpleSidecarClient Class Reference	49
7.14.1	Detailed Description	50
7.14.2	Member Enumeration Documentation	50
7.14.2.1	NetworkType	50
7.14.3	Constructor & Destructor Documentation	50
7.14.3.1	SimpleSidecarClient	50
7.14.4	Member Function Documentation	50
7.14.4.1	addKeyTag	50
7.14.4.2	addReading	51
7.14.4.3	addTag	52
7.14.4.4	authenticate	52
7.14.4.5	createOrRetrieveAccessKeys	52
7.14.4.6	createUser	52
7.14.4.7	currentTime	53
7.14.4.8	currentTimeMillis	53
7.14.4.9	date	53

7.14.4.10 deleteUser	53
7.14.4.11 initAPIKey	53
7.14.4.12 initEventAPI	53
7.14.4.13 initNetworkType	54
7.14.4.14 initUserKey	54
7.14.4.15 initUUID	54
7.14.4.16 initUUID	54
7.14.4.17 publish	54
7.15 qsense::net::SidecarClient::UserResponse Struct Reference	54
7.15.1 Detailed Description	55
7.15.2 Constructor & Destructor Documentation	55
7.15.2.1 UserResponse	55
7.15.3 Member Function Documentation	56
7.15.3.1 create	56
7.15.4 Member Data Documentation	56
7.15.4.1 keyId	56
7.15.4.2 responseCode	56
7.15.4.3 secret	56
7.16 SimpleSidecarClient::UserResponse Struct Reference	56
7.16.1 Detailed Description	56
7.16.2 Constructor & Destructor Documentation	56
7.16.2.1 UserResponse	56
7.16.3 Member Data Documentation	57
7.16.3.1 keyId	57
7.16.3.2 responseCode	57
7.16.3.3 secret	57
7.17 qsense::UUID Class Reference	57
7.17.1 Detailed Description	59
7.17.2 Member Enumeration Documentation	59
7.17.2.1 Version	59
7.17.3 Constructor & Destructor Documentation	59
7.17.3.1 UUID	59
7.17.3.2 UUID	59
7.17.3.3 UUID	59
7.17.3.4 UUID	59
7.17.3.5 ~UUID	59
7.17.3.6 UUID	59
7.17.3.7 UUID	59
7.17.4 Member Function Documentation	60
7.17.4.1 appendHex	60

7.17.4.2	appendHex	60
7.17.4.3	appendHex	60
7.17.4.4	compare	60
7.17.4.5	copyFrom	60
7.17.4.6	copyTo	60
7.17.4.7	create	60
7.17.4.8	dns	60
7.17.4.9	fromNetwork	60
7.17.4.10	init	60
7.17.4.11	isNull	60
7.17.4.12	nibble	60
7.17.4.13	null	61
7.17.4.14	oid	61
7.17.4.15	operator"!="	61
7.17.4.16	operator<	61
7.17.4.17	operator<=	61
7.17.4.18	operator=	61
7.17.4.19	operator==	61
7.17.4.20	operator>	61
7.17.4.21	operator>=	61
7.17.4.22	parse	61
7.17.4.23	randomNumber	61
7.17.4.24	toNetwork	61
7.17.4.25	toString	61
7.17.4.26	uri	61
7.17.4.27	variant	61
7.17.4.28	version	62
7.17.4.29	x500	62
8	File Documentation	63
8.1	/Users/rakesh/svn/customer/qsense/desktop/src/api/AutoPtr.h File Reference	63
8.2	/Users/rakesh/svn/customer/qsense/desktop/src/api/ByteOrder.h File Reference	64
8.2.1	Macro Definition Documentation	65
8.2.1.1	IMPLEMENT_BYTEORDER_BIG	65
8.2.1.2	IMPLEMENT_BYTEORDER_FLIP	65
8.2.1.3	IMPLEMENT_BYTEORDER_FLIP_	66
8.2.1.4	IMPLEMENT_BYTEORDER_LIT	66
8.2.1.5	IMPLEMENT_BYTEORDER_NOOP	66
8.2.1.6	IMPLEMENT_BYTEORDER_NOOP_	66
8.3	/Users/rakesh/svn/customer/qsense/desktop/src/api/Event.h File Reference	66

8.4	/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Base64.h File Reference	68
8.5	/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/MD5.h File Reference	69
8.5.1	Macro Definition Documentation	69
8.5.1.1	MD5_HASH_LENGTH	69
8.6	/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Sha1.h File Reference	69
8.7	/Users/rakesh/svn/customer/qsense/desktop/src/api/Location.h File Reference	70
8.8	/Users/rakesh/svn/customer/qsense/desktop/src/api/mainpage.dox File Reference	72
8.9	/Users/rakesh/svn/customer/qsense/desktop/src/api/net/DateTime.h File Reference	72
8.10	/Users/rakesh/svn/customer/qsense/desktop/src/api/net/HttpRequest.h File Reference	73
8.11	/Users/rakesh/svn/customer/qsense/desktop/src/api/net/QHttpClient.h File Reference	75
8.12	/Users/rakesh/svn/customer/qsense/desktop/src/api/net/SidecarClient.h File Reference	76
8.13	/Users/rakesh/svn/customer/qsense/desktop/src/api/QSense.h File Reference	76
8.14	/Users/rakesh/svn/customer/qsense/desktop/src/api/Reading.h File Reference	77
8.15	/Users/rakesh/svn/customer/qsense/desktop/src/api/RefCountedObject.h File Reference	79
8.16	/Users/rakesh/svn/customer/qsense/desktop/src/api/SimpleSidecarClient.h File Reference	80
8.17	/Users/rakesh/svn/customer/qsense/desktop/src/api/UUID.h File Reference	81
Index		83

Chapter 1

QSense Sidecar Library

1.1 Contents

- [Overview](#) Overview
- [Workflow](#) Workflow
- [Initialisation](#) Initialisation
- [Publish Sensor Data](#) Publish Sensor Data
- [Libraries](#) Libraries

1.2 Overview

A standard C++ library for interacting with the Sidecar Event API. Developed for use on Arduino platform, but was developed and tested on Mac OS X and Windows.

The library exposes two interfaces. A simple ([SimpleSidecarClient](#)) Arduino specific class that abstracts the raw C++ API, and the raw C++ API that can be used from all platforms (including Arduino).

1.3 Workflow

The general workflow for publishing an event to the Sidecar Event API is as follows:

- Register with Sidecar and provision your application with an access key/secret pair.
- While bootstrapping your application, provision a user account (email address/password) and retrieve the user access key/secret pair. Use the user access key/secret to initialise the library.
- Create an instance of [qsense::Event](#).
- Add instances of [qsense::Reading](#) to the event.
- Add any tag values to the event (tags are instances of [qsense::QString](#)).
- Create an instance of [qsense::net::SidecarClient](#)
- Publish the event using [qsense::net::SidecarClient::publish](#)

The simplified Arduino client encapsulates all these steps and variety of classes into a single class. There is no need to create instances of [qsense::Event](#) or [qsense::Reading](#). You can add reading data directly to the client and then publish the accumulated readings as one event.

1.4 Initialisation

The QSense Sidecar Library needs some initialisation (from the Arduino sketch for instance). The accompanying example sketches illustrate the recommended way of initialising the library.

1.4.1 Simple Arduino API

- Initialise the library with the type of networking used by the device using the [SimpleSidecarClient::initNetworkType](#) static method.
- Initialise the UUID engine with a proper MAC address using the [SimpleSidecarClient::initUUID](#) methods. Note, that there is an overloaded version of the method that will generate a random MAC address to use to initialise the UUID engine.

1.4.1.1 Provisioning API

- Initialise the API with the application access key/secret pair via the [SimpleSidecarClient::initAPIKey](#) method.
- Authenticate (or create a user account) with the Sidecar service using user's email address and password. This will retrieve the user access key/secret pair that will be used to submit sensor data to Sidecar. Use the [SimpleSidecarClient::authenticate](#) and [SimpleSidecarClient::createUser](#) methods.

1.4.1.2 Event API

- Initialise the Sidecar library with the user access key and secret used for authentication/authorisation. Use the [SimpleSidecarClient::initUserKey](#) method.
- Initialise the Event API with the stream identifier, device UUID, and a default geographic location. Use the [SimpleSidecarClient::initEventAPI](#) method.

1.4.2 Core API

- Initialise the library with the type of networking used by the device. Use the [qsense::net::initNetworkType\(qsense::net::NetworkType\)](#) function to indicate the type of network being used.
- Initialise the UUID engine with a proper MAC address ([qsense::UUID::init](#)). Official Arduino ethernet shields come with a MAC address labelled on the board (as per Arduino documentation). If using WiFi, the Arduino WiFi API allows lookup of the current MAC address. A stable and unique MAC address is essential for ensuring that UUID values generated (generates time based values) are truly universally unique.
- Initialise the API with the application access key/secret pair. Use the [qsense::net::SidecarClient::initAPIKey](#) method.
- Authenticate (or create a user account) with the Sidecar service using user's email address and password. This will retrieve the user access key/secret pair that will be used to submit sensor data to Sidecar. Use the [qsense::net::SidecarClient::authenticate](#) or [qsense::net::SidecarClient::createUser](#) methods to authenticate or create and provision the user account.
- Initialise the Sidecar library with the user access key and secret used for authentication/authorisation ([qsense::net::SidecarClient::initUserKey](#)).
- Initialise the Event API with the stream identifier, device UUID, and a default geographic [qsense::Location\(qsense::Event::init\)](#).

1.5 Publish Sensor Data

Once the Sidecar library has been properly initialised with the user access key and secret combination, sensor data may be published to Sidecar as events at any time.

1.5.1 Simple Arduino API

- Add readings to be published as one event using the [SimpleSidecarClient::addReading](#) method.
- Optionally add tags to the event using the [SimpleSidecarClient::addTag](#) method.
- Publish the accumulated readings as an event to Sidecar. Use the [SimpleSidecarClient::publish](#) method to publish the event.

1.5.2 Core API

- Create an instance of [qsense::Event](#).
- Create instances of [qsense::Reading](#) and assign it sensor data and any other relevant data that in combination constitute an event to be published to Sidecar. Use the [qsense::Event::add\(const qsense::Reading& \)](#) method.
- Optionally add tags to the event. Tags may be used when querying data stored in Sidecar. Use the [qsense::Event::add\(const qsense::QString& \)](#) method.
- Create an instance of the [qsense::net::SidecarClient](#) and publish the event using [qsense::net::SidecarClient::publish](#).

1.6 Libraries

The only third-party library necessary is the Standard C++ Library.

- [Standard C++](#)
- [Poco](#) - needed for using on non-Arduino platforms (for network interactions). We have tested only on Mac OS X and Windows, however Poco runs on most platforms including iOS and Android.

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

qsense	13
qsense::hash	14
qsense::hash::base64	15
qsense::net	15

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

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

qsense::AutoPtr< C >	17
qsense::ByteOrder	23
qsense::hash::Sha1::Context	26
qsense::net::DateTime	27
qsense::Event	28
qsense::net::HttpRequest	36
qsense::Location	38
qsense::hash::MD5	40
qsense::Reading	41
qsense::RefCountedObject	43
qsense::net::HttpClient	32
qsense::hash::Sha1	45
qsense::net::SidecarClient	46
SimpleSidecarClient	49
qsense::net::SidecarClient::UserResponse	54
SimpleSidecarClient::UserResponse	56
qsense::UUID	57

Chapter 4

Class Index

4.1 Class List

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

qsense::AutoPtr< C >	
AutoPtr is a "smart" pointer for classes implementing reference counting based garbage collection	17
qsense::ByteOrder	
This class contains a number of static methods to convert between big-endian and little-endian integers of various sizes	23
qsense::hash::Sha1::Context	
SHA1 context representation	26
qsense::net::DateTime	
Represents current date/time. Seeds initially (and daily) from a network time service, and uses internal timer to represent a real-time clock	27
qsense::Event	
A simple class that encapsulates an event sent to Sidecar. Events are holders for readings. Events can be serialised to JSON using the toString method	28
qsense::net::HttpClient	
A HTTP Client class for use with either ethernet or wifi. Before use, the client should be initialised with the network type used by the device (qsense::net::initNetworkType	32
qsense::net::HttpRequest	
A simple class that represents a HTTP request. Request encapsulates the URI path, any request parameters, header attributes, body etc. as appropriate	36
qsense::Location	
A simple representation of geographical location	38
qsense::hash::MD5	
Class for generating MD5 hashes	40
qsense::Reading	
A class that represents a single reading. Readings are added to an Event	41
qsense::RefCountedObject	
A base class for objects that employ reference counting based garbage collection	43
qsense::hash::Sha1	
Class for hashing using SHA1 algorithm	45
qsense::net::SidecarClient	
Class that encapsulates interactions with the Sidecar REST API	46
SimpleSidecarClient	
A simple client implementation that hides the low-level API	49
qsense::net::SidecarClient::UserResponse	
A simple structure that represents the result of a user provisioning request	54
SimpleSidecarClient::UserResponse	
A simple data structure that represents the response from Sidecar Provisioning API	56

[qsense::UUID](#)

A class that represents a UUID/GUID [57](#)

Chapter 5

File Index

5.1 File List

Here is a list of all files with brief descriptions:

/Users/rakesh/svn/customer/qsense/desktop/src/api/ AutoPtr.h	63
/Users/rakesh/svn/customer/qsense/desktop/src/api/ ByteOrder.h	64
/Users/rakesh/svn/customer/qsense/desktop/src/api/ Event.h	66
/Users/rakesh/svn/customer/qsense/desktop/src/api/ Location.h	70
/Users/rakesh/svn/customer/qsense/desktop/src/api/ QSense.h	76
/Users/rakesh/svn/customer/qsense/desktop/src/api/ Reading.h	77
/Users/rakesh/svn/customer/qsense/desktop/src/api/ RefCountedObject.h	79
/Users/rakesh/svn/customer/qsense/desktop/src/api/ SimpleSidecarClient.h	80
/Users/rakesh/svn/customer/qsense/desktop/src/api/ UUID.h	81
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/ Base64.h	68
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/ MD5.h	69
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/ Sha1.h	69
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/ DateTime.h	72
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/ HttpRequest.h	73
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/ QHttpClient.h	75
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/ SidecarClient.h	76

Chapter 6

Namespace Documentation

6.1 qsense Namespace Reference

Namespaces

- [hash](#)
- [net](#)

Classes

- class [AutoPtr](#)
[AutoPtr](#) is a "smart" pointer for classes implementing reference counting based garbage collection.
- class [ByteOrder](#)
This class contains a number of static methods to convert between big-endian and little-endian integers of various sizes.
- class [Event](#)
A simple class that encapsulates an event sent to Sidecar. Events are holders for readings. Events can be serialised to JSON using the [toString](#) method.
- class [Location](#)
A simple representation of geographical location.
- class [Reading](#)
A class that represents a single reading. Readings are added to an [Event](#).
- class [RefCountedObject](#)
A base class for objects that employ reference counting based garbage collection.
- class [UUID](#)
A class that represents a UUID/GUID.

Typedefs

- typedef std::string [QString](#)
- typedef unsigned char [Byte](#)

Functions

- template<class C >
void [swap](#) ([AutoPtr](#)< C > &p1, [AutoPtr](#)< C > &p2)
- std::ostream & [operator](#)<< (std::ostream &os, const [Event](#) &event)

Serialise the specified event as JSON to the output stream.

- `std::ostream & operator<< (std::ostream &os, const qsense::Location &location)`

Serialise the specified location to the output stream.

- `std::ostream & operator<< (std::ostream &os, const qsense::Reading &reading)`

Serialise the reading as JSON to the output stream.

6.1.1 Detailed Description

The namespace for the QSense Sidecar Library.

6.1.2 Typedef Documentation

6.1.2.1 typedef unsigned char [qsense::Byte](#)

8-bit unsigned char

6.1.2.2 typedef std::string [qsense::QString](#)

Not really necessary any more. Initially had it to use String class from Arduino library, but that never seems to work when used for hashing etc.

6.1.3 Function Documentation

6.1.3.1 `std::ostream& qsense::operator<< (std::ostream & os, const qsense::Location & location)`

Serialise the specified location to the output stream.

6.1.3.2 `std::ostream& qsense::operator<< (std::ostream & os, const qsense::Reading & reading)`

Serialise the reading as JSON to the output stream.

6.1.3.3 `std::ostream& qsense::operator<< (std::ostream & os, const Event & event)`

Serialise the specified event as JSON to the output stream.

6.1.3.4 `template<class C > void qsense::swap (AutoPtr< C > & p1, AutoPtr< C > & p2)` `[inline]`

6.2 [qsense::hash](#) Namespace Reference

Namespaces

- [base64](#)

Classes

- class [MD5](#)

Class for generating [MD5](#) hashes.

- class [Sha1](#)

Class for hashing using [SHA1](#) algorithm.

6.2.1 Detailed Description

Namespace for classes and functions that provide hashing support.

6.3 qsense::hash::base64 Namespace Reference

Functions

- `int32_t encodeLength` (`int32_t len`)
- `int32_t encode` (`char *output`, `const char *input`, `int32_t inputLength`)
- `int32_t decodeLength` (`const char *code`)
- `int32_t decode` (`char *outputPlainText`, `const char *encoded`)

6.3.1 Detailed Description

Namespace for functions that provide Base64 encoding/decoding support.

6.3.2 Function Documentation

6.3.2.1 `int32_t qsense::hash::base64::decode (char * outputPlainText, const char * encoded)`

Decode into outputPlainText the encoded contents

6.3.2.2 `int32_t qsense::hash::base64::decodeLength (const char * code)`

Use to specify size of output array to decode into

6.3.2.3 `int32_t qsense::hash::base64::encode (char * output, const char * input, int32_t inputLength)`

Encode into output contents of plain_src of specified length

6.3.2.4 `int32_t qsense::hash::base64::encodeLength (int32_t len)`

Use to specify size of output array to encode into

6.4 qsense::net Namespace Reference

Classes

- class `DateTime`
Represents current date/time. Seeds initially (and daily) from a network time service, and uses internal timer to represent a real-time clock.
- class `HttpClient`
A HTTP Client class for use with either ethernet or wifi. Before use, the client should be initialised with the network type used by the device (`qsense::net::initNetworkType`).
- class `HttpRequest`
A simple class that represents a HTTP request. Request encapsulates the URI path, any request parameters, header attributes, body etc. as appropriate.
- class `SidecarClient`
Class that encapsulates interactions with the Sidecar REST API.

Enumerations

- enum [NetworkType](#) { [Ethernet](#) = 0, [WiFi](#) = 1 }
Enumeration of network connection types for device.

Functions

- uint32_t [millis](#) ()
- void [initNetworkType](#) ([NetworkType](#) type)

6.4.1 Detailed Description

Namespace for classes that provide network services and require a network connection to work.

6.4.2 Enumeration Type Documentation

6.4.2.1 enum [qsense::net::NetworkType](#)

Enumeration of network connection types for device.

Enumerator

[Ethernet](#)

[WiFi](#)

6.4.3 Function Documentation

6.4.3.1 void [qsense::net::initNetworkType](#) ([NetworkType](#) type)

Initialise the API to use the specified type. [HttpClient::create](#) uses this type to create appropriate implementation.

6.4.3.2 uint32_t [qsense::net::millis](#) ()

Chapter 7

Class Documentation

7.1 `qsense::AutoPtr< C >` Class Template Reference

`AutoPtr` is a "smart" pointer for classes implementing reference counting based garbage collection.

```
#include <AutoPtr.h>
```

Public Member Functions

- `AutoPtr ()`
Default constructor. Creates a new instance that points to nothing.
- `AutoPtr (C *ptr)`
Create an auto pointer that takes ownership of the specified pointer.
- `AutoPtr (C *ptr, bool shared)`
AutoPtr Create an auto pointer that takes ownership of the specified pointer.
- `AutoPtr (const AutoPtr &ptr)`
Copy constructor. Increases the reference count for the owned object.
- `template<class Other > AutoPtr (const AutoPtr< Other > &ptr)`
Copy constructor for taking ownership of another type of object.
- `~AutoPtr ()`
Destructor. Invokes `release` on the owned object.
- `AutoPtr & assign (C *ptr)`
Use to (re)set the owned object. If current owned object is not `null`, invokes `release` on the object.
- `AutoPtr & assign (C *ptr, bool shared)`
Reset the owned object. If current owned object is not `null`, invokes `release` on the object. Will invoke `duplicate` on the new instance if `shared` is specified.
- `AutoPtr & assign (const AutoPtr &ptr)`
Share the pointer owned by the specified auto pointer instance.
- `template<class Other > AutoPtr & assign (const AutoPtr< Other > &ptr)`
Share the pointer owned by the specified auto pointer of different type.
- `AutoPtr & operator= (C *ptr)`
Copy assignment operator. Delegates to `assign`.
- `AutoPtr & operator= (const AutoPtr &ptr)`
Copy assignment operator. Delegates to `assign`.
- `template<class Other > AutoPtr & operator= (const AutoPtr< Other > &ptr)`

Copy assignment operator. Delegates to [assign](#).

- void [swap](#) ([AutoPtr](#) &ptr)

Swap the pointers of this instance with the specified instance.

- template<class Other >

[AutoPtr](#)< Other > [cast](#) () const

Casts the [AutoPtr](#) via a dynamic cast to the given type. Returns an [AutoPtr](#) containing NULL if the cast fails. Example: (assume class Sub: public Super) [AutoPtr](#)<Super> super(new Sub()); [AutoPtr](#)<Sub> sub = super.[←](#) cast<Sub>(); poco_assert (sub.get());.

- template<class Other >

[AutoPtr](#)< Other > [unsafeCast](#) () const

Casts the [AutoPtr](#) via a static cast to the given type. Example: (assume class Sub: public Super) [AutoPtr](#)<Super> super(new Sub()); [AutoPtr](#)<Sub> sub = super.[unsafeCast](#)<Sub>(); poco_assert (sub.get());.

- C * [operator->](#) ()

Pointer access operator for the owned object. Returns NULL if invalid.

- const C * [operator->](#) () const

Pointer access operator for the owned object. Returns NULL if invalid.

- C & [operator*](#) ()

Dereference operator for the owned object. Will lead to program termination if the owned object is not valid.

- const C & [operator*](#) () const

Dereference operator for the owned object. Will lead to program termination if the owned object is not valid.

- C * [get](#) ()

Return the owned pointer. Callers must not delete.

- const C * [get](#) () const

Return the owned pointer. Callers must not delete.

- [operator C *](#) ()

Function operator. Return the owned pointer.

- [operator const C *](#) () const

Function operator. Return the owned pointer.

- bool [operator!](#) () const

Negative check of make sure the owned pointer is not valid.

- bool [isNull](#) () const

Negative check of make sure the owned pointer is not valid.

- C * [duplicate](#) ()

Invokes [duplicate\(\)](#) on the owned pointer if valid.

- bool [operator==](#) (const [AutoPtr](#) &ptr) const

Compare the owned objects for equality.

- bool [operator==](#) (const C *ptr) const

Compare the owned object against the specified object for equality.

- bool [operator==](#) (C *ptr) const

Compare the owned object against the specified object for equality.

- bool [operator!=](#) (const [AutoPtr](#) &ptr) const

Compare the owned objects for inequality.

- bool [operator!=](#) (const C *ptr) const

Compare the owned object against the specified object for inequality.

- bool [operator!=](#) (C *ptr) const

Compare the owned object against the specified object for inequality.

- bool [operator<](#) (const [AutoPtr](#) &ptr) const

Compare the owned objects for ordering.

- bool [operator<](#) (const C *ptr) const

Compare the owned object against the specified object for ordering.

- bool [operator<](#) (C *ptr) const

Compare the owned object against the specified object for ordering.

- `bool operator<= (const AutoPtr &ptr) const`
- `bool operator<= (const C *ptr) const`
- `bool operator<= (C *ptr) const`
- `bool operator> (const AutoPtr &ptr) const`
- `bool operator> (const C *ptr) const`
- `bool operator> (C *ptr) const`
- `bool operator>= (const AutoPtr &ptr) const`
- `bool operator>= (const C *ptr) const`
- `bool operator>= (C *ptr) const`

7.1.1 Detailed Description

`template<class C>class qsense::AutoPtr< C >`

`AutoPtr` is a "smart" pointer for classes implementing reference counting based garbage collection.

To be usable with the `AutoPtr` template, a class must implement the following behaviour:

- A class must maintain a reference count.
- The constructors of the object initialize the reference count to one.
- The class must implement a public `duplicate()` method: `void duplicate();` that increments the reference count by one.
- The class must implement a public `release()` method: `void release();` that decrements the reference count by one, and, if the reference count reaches zero, deletes the object.

`AutoPtr` works in the following way:

- If an `AutoPtr` is assigned an ordinary pointer to an object (via the constructor or the assignment operator), it takes ownership of the object and the object's reference count remains unchanged.
- If the `AutoPtr` is assigned another `AutoPtr`, the object's reference count is incremented by one by calling `duplicate()` on its object.
- The destructor of `AutoPtr` calls `release()` on its object.
- `AutoPtr` supports dereferencing with both the `->` and the `*` operator. An attempt to dereference a null `AutoPtr` results in a error that will cause application termination. `AutoPtr` also implements all relational operators. Note that `AutoPtr` allows casting of its encapsulated data types.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 `template<class C> qsense::AutoPtr< C >::AutoPtr () [inline]`

Default constructor. Creates a new instance that points to nothing.

7.1.2.2 `template<class C> qsense::AutoPtr< C >::AutoPtr (C * ptr) [inline]`

Create an auto pointer that takes ownership of the specified pointer.

7.1.2.3 `template<class C> qsense::AutoPtr< C >::AutoPtr (C * ptr, bool shared) [inline]`

`AutoPtr` Create an auto pointer that takes ownership of the specified pointer.

Parameters

<i>ptr</i>	The pointer to take ownership of
<i>shared</i>	If <code>true</code> then increment the reference count for the specified pointer.

7.1.2.4 `template<class C> qsense::AutoPtr<C>::AutoPtr (const AutoPtr<C> & ptr) [inline]`

Copy constructor. Increases the reference count for the owned object.

7.1.2.5 `template<class C> template<class Other> qsense::AutoPtr<C>::AutoPtr (const AutoPtr<Other> & ptr) [inline]`

Copy constructor for taking ownership of another type of object.

7.1.2.6 `template<class C> qsense::AutoPtr<C>::~~AutoPtr () [inline]`

Destructor. Invokes `release` on the owned object.

7.1.3 Member Function Documentation

7.1.3.1 `template<class C> AutoPtr& qsense::AutoPtr<C>::assign (C * ptr) [inline]`

Use to (re)set the owned object. If current owned object is not `null`, invokes `release` on the object.

7.1.3.2 `template<class C> AutoPtr& qsense::AutoPtr<C>::assign (C * ptr, bool shared) [inline]`

Reset the owned object. If current owned object is not `null`, invokes `release` on the object. Will invoke `duplicate` on the new instance if `shared` is specified.

Parameters

<i>ptr</i>	The new object to take ownership of.
<i>shared</i>	If <code>true</code> , <code>duplicate()</code> the owned object.

Returns

Reference to this instance for convenience.

7.1.3.3 `template<class C> AutoPtr& qsense::AutoPtr<C>::assign (const AutoPtr<C> & ptr) [inline]`

Share the pointer owned by the specified auto pointer instance.

7.1.3.4 `template<class C> template<class Other> AutoPtr& qsense::AutoPtr<C>::assign (const AutoPtr<Other> & ptr) [inline]`

Share the pointer owned by the specified auto pointer of different type.

7.1.3.5 `template<class C> template<class Other> AutoPtr<Other> qsense::AutoPtr<C>::cast () const [inline]`

Casts the `AutoPtr` via a dynamic cast to the given type. Returns an `AutoPtr` containing `NULL` if the cast fails. Example: (assume class `Sub`: `public Super`) `AutoPtr<Super> super(new Sub()); AutoPtr<Sub> sub = super.cast<Sub>(); poco_assert (sub.get());`.

7.1.3.6 `template<class C> C* qsense::AutoPtr< C >::duplicate () [inline]`

Invokes `duplicate()` on the owned pointer if valid.

7.1.3.7 `template<class C> C* qsense::AutoPtr< C >::get () [inline]`

Return the owned pointer. Callers must not `delete`.

7.1.3.8 `template<class C> const C* qsense::AutoPtr< C >::get () const [inline]`

Return the owned pointer. Callers must not `delete`.

7.1.3.9 `template<class C> bool qsense::AutoPtr< C >::isNull () const [inline]`

Negative check of make sure the owned pointer is not valid.

7.1.3.10 `template<class C> qsense::AutoPtr< C >::operator C * () [inline]`

Function operator. Return the owned pointer.

7.1.3.11 `template<class C> qsense::AutoPtr< C >::operator const C * () const [inline]`

Function operator. Return the owned pointer.

7.1.3.12 `template<class C> bool qsense::AutoPtr< C >::operator! () const [inline]`

Negative check of make sure the owned pointer is not valid.

7.1.3.13 `template<class C> bool qsense::AutoPtr< C >::operator!= (const AutoPtr< C > & ptr) const [inline]`

Compare the owned objects for inequality.

7.1.3.14 `template<class C> bool qsense::AutoPtr< C >::operator!= (const C * ptr) const [inline]`

Compare the owned object against the specified object for inequality.

7.1.3.15 `template<class C> bool qsense::AutoPtr< C >::operator!= (C * ptr) const [inline]`

Compare the owned object against the specified object for inequality.

7.1.3.16 `template<class C> C& qsense::AutoPtr< C >::operator* () [inline]`

Dereference operator for the owned object. Will lead to program termination if the owned object is not valid.

7.1.3.17 `template<class C> const C& qsense::AutoPtr< C >::operator* () const [inline]`

Dereference operator for the owned object. Will lead to program termination if the owned object is not valid.

7.1.3.18 `template<class C> C* qsense::AutoPtr<C>::operator->() [inline]`

Pointer access operator for the owned object. Returns `NULL` if invalid.

7.1.3.19 `template<class C> const C* qsense::AutoPtr<C>::operator->() const [inline]`

Pointer access operator for the owned object. Returns `NULL` if invalid.

7.1.3.20 `template<class C> bool qsense::AutoPtr<C>::operator<(const AutoPtr<C> & ptr) const [inline]`

Compare the owned objects for ordering.

7.1.3.21 `template<class C> bool qsense::AutoPtr<C>::operator<(const C * ptr) const [inline]`

Compare the owned object against the specified object for ordering.

7.1.3.22 `template<class C> bool qsense::AutoPtr<C>::operator<(C * ptr) const [inline]`

Compare the owned object against the specified object for ordering.

7.1.3.23 `template<class C> bool qsense::AutoPtr<C>::operator<=(const AutoPtr<C> & ptr) const [inline]`

7.1.3.24 `template<class C> bool qsense::AutoPtr<C>::operator<=(const C * ptr) const [inline]`

7.1.3.25 `template<class C> bool qsense::AutoPtr<C>::operator<=(C * ptr) const [inline]`

7.1.3.26 `template<class C> AutoPtr& qsense::AutoPtr<C>::operator=(C * ptr) [inline]`

Copy assignment operator. Delegates to [assign](#).

7.1.3.27 `template<class C> AutoPtr& qsense::AutoPtr<C>::operator=(const AutoPtr<C> & ptr) [inline]`

Copy assignment operator. Delegates to [assign](#).

7.1.3.28 `template<class C> template<class Other> AutoPtr& qsense::AutoPtr<C>::operator=(const AutoPtr<Other> & ptr) [inline]`

Copy assignment operator. Delegates to [assign](#).

7.1.3.29 `template<class C> bool qsense::AutoPtr<C>::operator==(const AutoPtr<C> & ptr) const [inline]`

Compare the owned objects for equality.

7.1.3.30 `template<class C> bool qsense::AutoPtr<C>::operator==(const C * ptr) const [inline]`

Compare the owned object against the specified object for equality.

7.1.3.31 `template<class C> bool qsense::AutoPtr<C>::operator==(C * ptr) const [inline]`

Compare the owned object against the specified object for equality.

7.1.3.32 `template<class C> bool qsense::AutoPtr<C>::operator> (const AutoPtr<C> & ptr) const [inline]`

7.1.3.33 `template<class C> bool qsense::AutoPtr<C>::operator> (const C * ptr) const [inline]`

7.1.3.34 `template<class C> bool qsense::AutoPtr<C>::operator> (C * ptr) const [inline]`

7.1.3.35 `template<class C> bool qsense::AutoPtr<C>::operator>= (const AutoPtr<C> & ptr) const [inline]`

7.1.3.36 `template<class C> bool qsense::AutoPtr<C>::operator>= (const C * ptr) const [inline]`

7.1.3.37 `template<class C> bool qsense::AutoPtr<C>::operator>= (C * ptr) const [inline]`

7.1.3.38 `template<class C> void qsense::AutoPtr<C>::swap (AutoPtr<C> & ptr) [inline]`

Swap the pointers of this instance with the specified instance.

7.1.3.39 `template<class C> template<class Other> AutoPtr<Other> qsense::AutoPtr<C>::unsafeCast () const [inline]`

Casts the [AutoPtr](#) via a static cast to the given type. Example: (assume class Sub: public Super) `AutoPtr<Super> super(new Sub()); AutoPtr<Sub> sub = super.unsafeCast<Sub>(); poco_assert (sub.get());`.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/AutoPtr.h`

7.2 qsense::ByteOrder Class Reference

This class contains a number of static methods to convert between big-endian and little-endian integers of various sizes.

```
#include <ByteOrder.h>
```

Static Public Member Functions

- static `int16_t flipBytes (int16_t value)`
- static `uint16_t flipBytes (uint16_t value)`
- static `int32_t flipBytes (int32_t value)`
- static `uint32_t flipBytes (uint32_t value)`
- static `int64_t flipBytes (int64_t value)`
- static `uint64_t flipBytes (uint64_t value)`
- static `int16_t toBigEndian (int16_t value)`
- static `uint16_t toBigEndian (uint16_t value)`
- static `int32_t toBigEndian (int32_t value)`
- static `uint32_t toBigEndian (uint32_t value)`
- static `int64_t toBigEndian (int64_t value)`
- static `uint64_t toBigEndian (uint64_t value)`
- static `int16_t fromBigEndian (int16_t value)`
- static `uint16_t fromBigEndian (uint16_t value)`

- static int32_t [fromBigEndian](#) (int32_t value)
- static uint32_t [fromBigEndian](#) (uint32_t value)
- static int64_t [fromBigEndian](#) (int64_t value)
- static uint64_t [fromBigEndian](#) (uint64_t value)
- static int16_t [toLittleEndian](#) (int16_t value)
- static uint16_t [toLittleEndian](#) (uint16_t value)
- static int32_t [toLittleEndian](#) (int32_t value)
- static uint32_t [toLittleEndian](#) (uint32_t value)
- static int64_t [toLittleEndian](#) (int64_t value)
- static uint64_t [toLittleEndian](#) (uint64_t value)
- static int16_t [fromLittleEndian](#) (int16_t value)
- static uint16_t [fromLittleEndian](#) (uint16_t value)
- static int32_t [fromLittleEndian](#) (int32_t value)
- static uint32_t [fromLittleEndian](#) (uint32_t value)
- static int64_t [fromLittleEndian](#) (int64_t value)
- static uint64_t [fromLittleEndian](#) (uint64_t value)
- static int16_t [toNetwork](#) (int16_t value)
- static uint16_t [toNetwork](#) (uint16_t value)
- static int32_t [toNetwork](#) (int32_t value)
- static uint32_t [toNetwork](#) (uint32_t value)
- static int64_t [toNetwork](#) (int64_t value)
- static uint64_t [toNetwork](#) (uint64_t value)
- static int16_t [fromNetwork](#) (int16_t value)
- static uint16_t [fromNetwork](#) (uint16_t value)
- static int32_t [fromNetwork](#) (int32_t value)
- static uint32_t [fromNetwork](#) (uint32_t value)
- static int64_t [fromNetwork](#) (int64_t value)
- static uint64_t [fromNetwork](#) (uint64_t value)

7.2.1 Detailed Description

This class contains a number of static methods to convert between big-endian and little-endian integers of various sizes.

7.2.2 Member Function Documentation

- 7.2.2.1 int16_t qsense::ByteOrder::flipBytes (int16_t *value*) [inline], [static]
- 7.2.2.2 uint16_t qsense::ByteOrder::flipBytes (uint16_t *value*) [inline], [static]
- 7.2.2.3 int32_t qsense::ByteOrder::flipBytes (int32_t *value*) [inline], [static]
- 7.2.2.4 uint32_t qsense::ByteOrder::flipBytes (uint32_t *value*) [inline], [static]
- 7.2.2.5 int64_t qsense::ByteOrder::flipBytes (int64_t *value*) [inline], [static]
- 7.2.2.6 uint64_t qsense::ByteOrder::flipBytes (uint64_t *value*) [inline], [static]
- 7.2.2.7 static int16_t qsense::ByteOrder::fromBigEndian (int16_t *value*) [static]
- 7.2.2.8 static uint16_t qsense::ByteOrder::fromBigEndian (uint16_t *value*) [static]
- 7.2.2.9 static int32_t qsense::ByteOrder::fromBigEndian (int32_t *value*) [static]

- 7.2.2.10 static uint32_t qsense::ByteOrder::fromBigEndian (uint32_t *value*) [static]
- 7.2.2.11 static int64_t qsense::ByteOrder::fromBigEndian (int64_t *value*) [static]
- 7.2.2.12 static uint64_t qsense::ByteOrder::fromBigEndian (uint64_t *value*) [static]
- 7.2.2.13 static int16_t qsense::ByteOrder::fromLittleEndian (int16_t *value*) [static]
- 7.2.2.14 static uint16_t qsense::ByteOrder::fromLittleEndian (uint16_t *value*) [static]
- 7.2.2.15 static int32_t qsense::ByteOrder::fromLittleEndian (int32_t *value*) [static]
- 7.2.2.16 static uint32_t qsense::ByteOrder::fromLittleEndian (uint32_t *value*) [static]
- 7.2.2.17 static int64_t qsense::ByteOrder::fromLittleEndian (int64_t *value*) [static]
- 7.2.2.18 static uint64_t qsense::ByteOrder::fromLittleEndian (uint64_t *value*) [static]
- 7.2.2.19 static int16_t qsense::ByteOrder::fromNetwork (int16_t *value*) [static]
- 7.2.2.20 static uint16_t qsense::ByteOrder::fromNetwork (uint16_t *value*) [static]
- 7.2.2.21 static int32_t qsense::ByteOrder::fromNetwork (int32_t *value*) [static]
- 7.2.2.22 static uint32_t qsense::ByteOrder::fromNetwork (uint32_t *value*) [static]
- 7.2.2.23 static int64_t qsense::ByteOrder::fromNetwork (int64_t *value*) [static]
- 7.2.2.24 static uint64_t qsense::ByteOrder::fromNetwork (uint64_t *value*) [static]
- 7.2.2.25 static int16_t qsense::ByteOrder::toBigEndian (int16_t *value*) [static]
- 7.2.2.26 static uint16_t qsense::ByteOrder::toBigEndian (uint16_t *value*) [static]
- 7.2.2.27 static int32_t qsense::ByteOrder::toBigEndian (int32_t *value*) [static]
- 7.2.2.28 static uint32_t qsense::ByteOrder::toBigEndian (uint32_t *value*) [static]
- 7.2.2.29 static int64_t qsense::ByteOrder::toBigEndian (int64_t *value*) [static]
- 7.2.2.30 static uint64_t qsense::ByteOrder::toBigEndian (uint64_t *value*) [static]
- 7.2.2.31 static int16_t qsense::ByteOrder::toLittleEndian (int16_t *value*) [static]
- 7.2.2.32 static uint16_t qsense::ByteOrder::toLittleEndian (uint16_t *value*) [static]
- 7.2.2.33 static int32_t qsense::ByteOrder::toLittleEndian (int32_t *value*) [static]
- 7.2.2.34 static uint32_t qsense::ByteOrder::toLittleEndian (uint32_t *value*) [static]
- 7.2.2.35 static int64_t qsense::ByteOrder::toLittleEndian (int64_t *value*) [static]
- 7.2.2.36 static uint64_t qsense::ByteOrder::toLittleEndian (uint64_t *value*) [static]
- 7.2.2.37 static int16_t qsense::ByteOrder::toNetwork (int16_t *value*) [static]

7.2.2.38 static uint16_t qsense::ByteOrder::toNetwork (uint16_t value) [static]

7.2.2.39 static int32_t qsense::ByteOrder::toNetwork (int32_t value) [static]

7.2.2.40 static uint32_t qsense::ByteOrder::toNetwork (uint32_t value) [static]

7.2.2.41 static int64_t qsense::ByteOrder::toNetwork (int64_t value) [static]

7.2.2.42 static uint64_t qsense::ByteOrder::toNetwork (uint64_t value) [static]

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

- /Users/rakesh/svn/customer/qsense/desktop/src/api/[ByteOrder.h](#)

7.3 qsense::hash::Sha1::Context Struct Reference

SHA1 context representation.

```
#include <Sha1.h>
```

Public Attributes

- unsigned long [total](#) [2]
- unsigned long [state](#) [5]
- unsigned char [buffer](#) [64]
- unsigned char [ipad](#) [64]
- unsigned char [opad](#) [64]

7.3.1 Detailed Description

SHA1 context representation.

7.3.2 Member Data Documentation

7.3.2.1 unsigned char qsense::hash::Sha1::Context::buffer[64]

data block being processed

7.3.2.2 unsigned char qsense::hash::Sha1::Context::ipad[64]

HMAC: inner padding

7.3.2.3 unsigned char qsense::hash::Sha1::Context::opad[64]

HMAC: outer padding

7.3.2.4 unsigned long qsense::hash::Sha1::Context::state[5]

intermediate digest state

7.3.2.5 unsigned long qsense::hash::Sha1::Context::total[2]

number of bytes processed

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

- /Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Sha1.h

7.4 qsense::net::DateTime Class Reference

Represents current date/time. Seeds initially (and daily) from a network time service, and uses internal timer to represent a real-time clock.

```
#include <DateTime.h>
```

Public Member Functions

- [DateTime](#) ()
Default constructor. Use [singleton](#) in general.
- const [qsense::QString](#) [currentTime](#) ()
Return the current date/time in ISO 8601 format.
- const [qsense::QString](#) [date](#) ()
Return the current date in ISO 8601 format.
- int64_t [currentTimeMillis](#) ()
Return the milli seconds since UNIX epoch.

Static Public Member Functions

- static [DateTime](#) & [singleton](#) ()
Return a singleton instance to use. This is the preferred way of using this class.

7.4.1 Detailed Description

Represents current date/time. Seeds initially (and daily) from a network time service, and uses internal timer to represent a real-time clock.

7.4.2 Constructor & Destructor Documentation

7.4.2.1 qsense::net::DateTime::DateTime ()

Default constructor. Use [singleton](#) in general.

7.4.3 Member Function Documentation

7.4.3.1 const qsense::QString qsense::net::DateTime::currentTime ()

Return the current date/time in ISO 8601 format.

7.4.3.2 int64_t qsense::net::DateTime::currentTimeMillis ()

Return the milli seconds since UNIX epoch.

7.4.3.3 `const qsense::QString qsense::net::DateTime::date ()`

Return the current date in ISO 8601 format.

7.4.3.4 `static DateTime& qsense::net::DateTime::singleton () [inline],[static]`

Return a singleton instance to use. This is the preferred way of using this class.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/net/DateTime.h`

7.5 `qsense::Event` Class Reference

A simple class that encapsulates an event sent to Sidecar. Events are holders for readings. Events can be serialised to JSON using the `toString` method.

```
#include <Event.h>
```

Public Types

- `typedef std::vector< Reading > Readings`
The vector of readings encapsulated in this event.
- `typedef std::vector< QString > Tags`
The vector of tags associated with this event.
- `typedef std::map< QString, Tags > KeyTags`
The map of key tags associated with this event.
- `typedef Readings::const_iterator ReadingsIterator`
Iterator for the readings encapsulated in this event.
- `typedef Tags::const_iterator TagsIterator`
Iterator for the tags associated with this event.
- `typedef KeyTags::const_iterator KeyTagsIterator`
Iterator for the key=tags associated with this event.

Public Member Functions

- `Event ()`
Default constructor. Uses default location set through [init](#).
- `Event (const Location &location)`
Create a new event with the specified location.
- `~Event ()`
Destructor. No actions required.
- `Event & add (const Reading &reading)`
Add the specified reading to this event.
- `Event & add (const QString &tag)`
*Add the specified tag to this event. **NOTE:** Tags should be single words without spaces.*
- `Event & add (const QString &key, const QString &tag)`
*Add the specified key-tag to this event. To specify multiple tags for the same key, call this method with the same key. **NOTE:** Tags should be single words without spaces.*
- `Event & operator+= (const Reading &reading)`
Operator for adding a reading to the event.

- [Event](#) & [operator+=](#) (const [QString](#) &tag)
Operator for adding a tag to the event. **NOTE:** Tags should be single words without spaces.
- [std::size_t numberOfReadings](#) () const
Return the number of readings in this event.
- [std::size_t numberOfTags](#) () const
Return the number of tags associated with this event.
- [std::size_t numberOfKeyTags](#) () const
Return the number of key-tags associated with this event.
- [ReadingsIterator beginReadings](#) () const
Return a constant iterator to the beginning of the readings vector.
- [ReadingsIterator endReadings](#) () const
The end of the readings vector to check in loops.
- [TagsIterator beginTags](#) () const
Return a constant iterator to the beginning of the tags vector.
- [TagsIterator endTags](#) () const
The end of the tags vector to check in loops.
- [KeyTagsIterator beginKeyTags](#) () const
Return a constant iterator to the beginning of the key-tags vector.
- [KeyTagsIterator endKeyTags](#) () const
The end of the key-tags map to check in loops.
- const [qsense::Reading](#) & [operator\[\]](#) (std::size_t index) const
[operator \[\]](#) Retrieve the reading at specified index. Will throw exception if index is out of bounds. Check the [size](#) of the container before using this operator.
- const [qsense::Location](#) & [getLocation](#) () const
Return the location used by this event.
- const [qsense::QString](#) [toString](#) () const
Serialise the event to JSON.

Static Public Member Functions

- static void [init](#) (const [qsense::QString](#) &deviceId, const [qsense::QString](#) &stream, const [qsense::Location](#) &location)
Initialise the [Event](#) API.

7.5.1 Detailed Description

A simple class that encapsulates an event sent to Sidecar. Events are holders for readings. Events can be serialised to JSON using the [toString](#) method.

7.5.2 Member Typedef Documentation

7.5.2.1 typedef std::map<QString,Tags> qsense::Event::KeyTags

The map of key tags associated with this event.

7.5.2.2 typedef KeyTags::const_iterator qsense::Event::KeyTagsIterator

Iterator for the key=tags associated with this event.

7.5.2.3 `typedef std::vector<Reading> qsense::Event::Readings`

The vector of readings encapsulated in this event.

7.5.2.4 `typedef Readings::const_iterator qsense::Event::ReadingsIterator`

Iterator for the readings encapsulated in this event.

7.5.2.5 `typedef std::vector<QString> qsense::Event::Tags`

The vector of tags associated with this event.

7.5.2.6 `typedef Tags::const_iterator qsense::Event::TagsIterator`

Iterator for the tags associated with this event.

7.5.3 Constructor & Destructor Documentation

7.5.3.1 `qsense::Event::Event ()`

Default constructor. Uses default location set through [init](#).

7.5.3.2 `qsense::Event::Event (const Location & location)`

Create a new event with the specified location.

7.5.3.3 `qsense::Event::~~Event () [inline]`

Destructor. No actions required.

7.5.4 Member Function Documentation

7.5.4.1 `Event& qsense::Event::add (const Reading & reading)`

Add the specified reading to this event.

7.5.4.2 `Event& qsense::Event::add (const QString & tag)`

Add the specified tag to this event. **NOTE:** Tags should be single words without spaces.

7.5.4.3 `Event& qsense::Event::add (const QString & key, const QString & tag)`

Add the specified key-tag to this event. To specify multiple tags for the same key, call this method with the same key. **NOTE:** Tags should be single words without spaces.

7.5.4.4 `KeyTagsIterator qsense::Event::beginKeyTags () const [inline]`

Return a constant iterator to the beginning of the key-tags vector.

7.5.4.5 ReadingsIterator qsense::Event::beginReadings () const [inline]

Return a constant iterator to the beginning of the readings vector.

7.5.4.6 TagsIterator qsense::Event::beginTags () const [inline]

Return a constant iterator to the beginning of the tags vector.

7.5.4.7 KeyTagsIterator qsense::Event::endKeyTags () const [inline]

The end of the key-tags map to check in loops.

7.5.4.8 ReadingsIterator qsense::Event::endReadings () const [inline]

The end of the readings vector to check in loops.

7.5.4.9 TagsIterator qsense::Event::endTags () const [inline]

The end of the tags vector to check in loops.

7.5.4.10 const qsense::Location& qsense::Event::getLocation () const [inline]

Return the location used by this event.

7.5.4.11 static void qsense::Event::init (const qsense::QString & *deviceId*, const qsense::QString & *stream*, const qsense::Location & *location*) [static]

Initialise the [Event](#) API.

Parameters

<i>deviceId</i>	The deviceId to use. No way at present to retrieve using API
<i>stream</i>	The stream identifier to use with Sidecar
<i>location</i>	A default location to use. No location tracking at present

7.5.4.12 std::size_t qsense::Event::numberOfKeyTags () const [inline]

Return the number of key-tags associated with this event.

7.5.4.13 std::size_t qsense::Event::numberOfReadings () const [inline]

Return the number of readings in this event.

7.5.4.14 std::size_t qsense::Event::numberOfTags () const [inline]

Return the number of tags associated with this event.

7.5.4.15 Event& qsense::Event::operator+=(const Reading & *reading*) [inline]

Operator for adding a reading to the event.

7.5.4.16 `Event& qsense::Event::operator+=(const QString & tag) [inline]`

Operator for adding a tag to the event. **NOTE:** Tags should be single words without spaces.

7.5.4.17 `const qsense::Reading& qsense::Event::operator[] (std::size_t index) const [inline]`

`operator []` Retrieve the reading at specified index. Will throw exception if index is out of bounds. Check the [size](#) of the container before using this operator.

Parameters

<i>index</i>	The index into the vector of readings.
--------------	--

Returns

The reading at the specified index.

7.5.4.18 `const qsense::QString qsense::Event::toString () const`

Serialise the event to JSON.

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

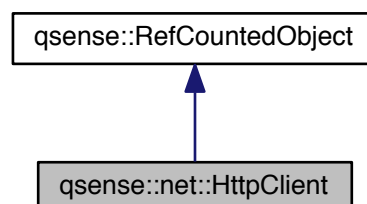
- `/Users/rakesh/svn/customer/qsense/desktop/src/api/Event.h`

7.6 `qsense::net::HttpClient` Class Reference

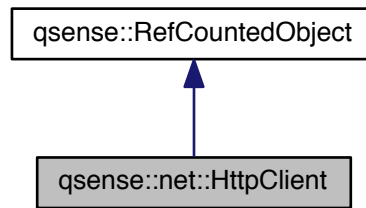
A HTTP Client class for use with either ethernet or wifi. Before use, the client should be initialised with the network type used by the device ([qsense::net::initNetworkType](#)).

```
#include <QHttpClient.h>
```

Inheritance diagram for `qsense::net::HttpClient`:



Collaboration diagram for qsense::net::HttpClient:



Public Types

- typedef `AutoPtr< HttpClient > Ptr`
Type for auto pointer to a http client instance.

Public Member Functions

- `HttpClient ()`
Default constructor.
- virtual `~HttpClient ()`
Destructor for sub-classes.
- virtual `int16_t connect (const qsense::QString &server, uint16_t port=80)=0`
Make a socket connection to the specified server on specified port (default 80)
- virtual `bool connected ()=0`
Check to see if the client is connected to the server.
- virtual `uint16_t get (const HttpRequest &request)=0`
Perform a GET request using information in the request object.
- virtual `uint16_t post (const HttpRequest &request)=0`
Perform a POST request using information in the request object.
- virtual `uint16_t remove (const HttpRequest &request)=0`
Perform a DELETE request using information in the request object. Named remove to get around delete being keyword.
- virtual `const qsense::QString readLine ()=0`
Read a line from the HTTP response.
- virtual `HttpRequest::Map readHeaders ()=0`
Return a map of the HTTP response headers.
- virtual `const qsense::QString readBody ()=0`
Read the entire contents of the server response body. Note: This method also reads headers. If headers have already been read, it may end up losing some of the response body.

Static Public Member Functions

- static `Ptr create ()`
Factory method for creating concrete instances based on initialisation.

Protected Member Functions

- virtual void `writeHeaders` (const `HttpRequest` &request, bool close=true)=0
Send the specified request headers to the HTTP server.

7.6.1 Detailed Description

A HTTP Client class for use with either ethernet or wifi. Before use, the client should be initialised with the network type used by the device (`qsense::net::initNetworkType`).

7.6.2 Member Typedef Documentation

7.6.2.1 `typedef AutoPtr<HttpClient> qsense::net::HttpClient::Ptr`

Type for auto pointer to a http client instance.

7.6.3 Constructor & Destructor Documentation

7.6.3.1 `qsense::net::HttpClient::HttpClient () [inline]`

Default constructor.

7.6.3.2 `virtual qsense::net::HttpClient::~~HttpClient () [inline],[virtual]`

Destructor for sub-classes.

7.6.4 Member Function Documentation

7.6.4.1 `virtual int16_t qsense::net::HttpClient::connect (const qsense::QString & server, uint16_t port = 80) [pure virtual]`

Make a socket connection to the specified server on specified port (default 80)

7.6.4.2 `virtual bool qsense::net::HttpClient::connected () [pure virtual]`

Check to see if the client is connected to the server.

7.6.4.3 `static Ptr qsense::net::HttpClient::create () [static]`

Factory method for creating concrete instances based on initialisation.

Returns

An instance that uses either ethernet or wifi to connect to the network. Callers must delete the returned instance.

7.6.4.4 `virtual uint16_t qsense::net::HttpClient::get (const HttpRequest & request) [pure virtual]`

Perform a GET request using information in the request object.

Parameters

<i>request</i>	The request object that encapsulates the uri and other relevant information
----------------	---

Returns

The HTTP response code from server.

7.6.4.5 `virtual uint16_t qsense::net::HttpClient::post (const HttpRequest & request) [pure virtual]`

Perform a POST request using information in the request object.

Parameters

<i>request</i>	The request object that encapsulates the uri and other relevant information
----------------	---

Returns

The HTTP response code from server.

7.6.4.6 `virtual const QString qsense::net::HttpClient::readBody () [pure virtual]`

Read the entire contents of the server response body. Note: This method also reads headers. If headers have already been read, it may end up losing some of the response body.

WARNING: Use with caution. Can run embedded devices out of memory very easily.

Returns

The entire http response body content.

7.6.4.7 `virtual HttpRequest::Map qsense::net::HttpClient::readHeaders () [pure virtual]`

Return a map of the HTTP response headers.

7.6.4.8 `virtual const QString qsense::net::HttpClient::readLine () [pure virtual]`

Read a line from the HTTP response.

A line can be either a header or content. Use to process raw HTTP response line by line.

Returns

A line (content until newline character) of text from raw response.

7.6.4.9 `virtual uint16_t qsense::net::HttpClient::remove (const HttpRequest & request) [pure virtual]`

Perform a DELETE request using information in the request object. Named remove to get around delete being keyword.

Parameters

<i>request</i>	The request object that encapsulates the uri and other relevant information
----------------	---

Returns

The HTTP response code from server.

7.6.4.10 `virtual void qsense::net::HttpClient::writeHeaders (const HttpRequest & request, bool close = true)`
`[protected],[pure virtual]`

Send the specified request headers to the HTTP server.

Parameters

<i>headers</i>	The map of headers to send to the server.
<i>close</i>	Flag indicating whether HTTP keep-alive is NOT to be used.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/net/QHttpClient.h`

7.7 qsense::net::HttpRequest Class Reference

A simple class that represents a HTTP request. Request encapsulates the URI path, any request parameters, header attributes, body etc. as appropriate.

```
#include <HttpRequest.h>
```

Public Types

- `typedef std::map< QString, QString > Map`
Map used to represent request parameters and headers.
- `typedef Map::const_iterator Iterator`
Constant iterator to access contents of the parameters and headers.

Public Member Functions

- `HttpRequest (const QString &uri)`
Constructor. Create a request for the specified server resource.
- `~HttpRequest ()`
Destructor. No actions required.
- `const QString &getUri () const`
Return the uri for which this request was created.
- `const QString &getBody () const`
Return the body to send as part of the request. For GET requests, this will be empty.
- `HttpRequest &setBody (const QString &body)`
Set the body to send as part of the request. This is meant for use primarily with POST/PUT type requests.
- `HttpRequest &setParameter (const QString &key, const QString &value)`
Add the specified key/value combination as a request parameter to this request. If a mapping already exists with the specified key, it will be replaced with the specified value.
- `HttpRequest &setHeader (const QString &key, const QString &value)`

Add the specified key/value combination as a request attribute to this request. If a mapping already exists with the specified key, it will be replaced with the specified value.

- `const QString getParameters () const`

Return the requests parameters as a string. **Note:** A leading ? symbol will not be added, which is required for GET requests. Calls must add if making a GET request.

- `Iterator beginHeaders () const`

Return a constant iterator to the beginning of the headers map.

- `Iterator endHeaders () const`

Return a constant iterator to the beginning of the headers map.

7.7.1 Detailed Description

A simple class that represents a HTTP request. Request encapsulates the URI path, any request parameters, header attributes, body etc. as appropriate.

7.7.2 Member Typedef Documentation

7.7.2.1 `typedef Map::const_iterator qsense::net::HttpRequest::Iterator`

Constant iterator to access contents of the parameters and headers.

7.7.2.2 `typedef std::map<QString,QString> qsense::net::HttpRequest::Map`

Map used to represent request parameters and headers.

7.7.3 Constructor & Destructor Documentation

7.7.3.1 `qsense::net::HttpRequest::HttpRequest (const QString & uri)`

Constructor. Create a request for the specified server resource.

7.7.3.2 `qsense::net::HttpRequest::~~HttpRequest () [inline]`

Destructor. No actions required.

7.7.4 Member Function Documentation

7.7.4.1 `Iterator qsense::net::HttpRequest::beginHeaders () const [inline]`

Return a constant iterator to the beginning of the headers map.

7.7.4.2 `Iterator qsense::net::HttpRequest::endHeaders () const [inline]`

Return a constant iterator to the beginning of the headers map.

7.7.4.3 `const QString& qsense::net::HttpRequest::getBody () const [inline]`

Return the body to send as part of the request. For GET requests, this will be empty.

7.7.4.4 `const QString qsense::net::HttpRequest::getParamters () const`

Return the requests parameters as a string. **Note:** A leading ? symbol will not be added, which is required for GET requests. Calls must add if making a GET request.

7.7.4.5 `const QString& qsense::net::HttpRequest::getUri () const` `[inline]`

Return the uri for which this request was created.

7.7.4.6 `HttpRequest& qsense::net::HttpRequest::setBody (const QString & body)`

Set the body to send as part of the request. This is meant for use primarily with POST/PUT type requests.

7.7.4.7 `HttpRequest& qsense::net::HttpRequest::setHeader (const QString & key, const QString & value)`

Add the specified key/value combination as a request attribute to this request. If a mapping already exists with the specified key, it will be replaced with the specified value.

7.7.4.8 `HttpRequest& qsense::net::HttpRequest::setParameter (const QString & key, const QString & value)`

Add the specified key/value combination as a request parameter to this request. If a mapping already exists with the specified key, it will be replaced with the specified value.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/net/HttpRequest.h`

7.8 `qsense::Location` Class Reference

A simple representation of geographical location.

```
#include <Location.h>
```

Public Member Functions

- `Location ()`
Default constructor.
- `Location (float lat, float lon)`
Create a new instance with the specified co-ordinates.
- `Location (const Location &location)`
Copy constructor.
- `~Location ()`
Destructor. No action required.
- `Location & operator= (const Location &location)`
Copy assignment operator.
- `const QString toString () const`
Serialise this instance to a JSON representation.
- `float getLatitude () const`
- `float getLongitude () const`

7.8.1 Detailed Description

A simple representation of geographical location.

7.8.2 Constructor & Destructor Documentation

7.8.2.1 `qsense::Location::Location ()` `[inline]`

Default constructor.

7.8.2.2 `qsense::Location::Location (float lat, float lon)` `[inline]`

Create a new instance with the specified co-ordinates.

Parameters

<i>lat</i>	The latitude
<i>lon</i>	The longitude

7.8.2.3 `qsense::Location::Location (const Location & location)` `[inline]`

Copy constructor.

7.8.2.4 `qsense::Location::~~Location ()` `[inline]`

Destructor. No action required.

7.8.3 Member Function Documentation

7.8.3.1 `float qsense::Location::getLatitude () const` `[inline]`

Returns

Return the latitude value

7.8.3.2 `float qsense::Location::getLongitude () const` `[inline]`

Returns

Return the longitude value

7.8.3.3 `Location& qsense::Location::operator= (const Location & location)`

Copy assignment operator.

7.8.3.4 `const qsense::QString qsense::Location::toString () const`

Serialise this instance to a JSON representation.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/Location.h`

7.9 qsense::hash::MD5 Class Reference

Class for generating MD5 hashes.

```
#include <MD5.h>
```

Public Types

- typedef [qsense::Byte](#) [Byte](#)
8-bit byte
- typedef uint32_t [Word](#)
32-bit word

Public Member Functions

- [MD5](#) ()
Default constructor.
- [~MD5](#) ()
Destructor. Destroys the context.
- void [compute](#) (const [Byte](#) *data, [Word](#) nbytes, [Byte](#) digest[MD5_HASH_LENGTH])
- [qsense::QString compute](#) (const [qsense::QString](#) &input)

7.9.1 Detailed Description

Class for generating MD5 hashes.

7.9.2 Member Typedef Documentation

7.9.2.1 typedef qsense::Byte qsense::hash::MD5::Byte

8-bit byte

7.9.2.2 typedef uint32_t qsense::hash::MD5::Word

32-bit word

7.9.3 Constructor & Destructor Documentation

7.9.3.1 qsense::hash::MD5::MD5 () [inline]

Default constructor.

7.9.3.2 qsense::hash::MD5::~~MD5 () [inline]

Destructor. Destroys the context.

7.9.4 Member Function Documentation

7.9.4.1 void qsense::hash::MD5::compute (const [Byte](#) * data, [Word](#) nbytes, [Byte](#) digest[MD5_HASH_LENGTH])

Compute the MD5 digest for the specified data of length nbytes into digest

7.9.4.2 qsense::QString qsense::hash::MD5::compute (const qsense::QString & input)

Compute MD5 digest for specified data and return base64 encoded string

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

- /Users/rakesh/svn/customer/qsense/desktop/src/api/hash/MD5.h

7.10 qsense::Reading Class Reference

A class that represents a single reading. Readings are added to an [Event](#).

```
#include <Reading.h>
```

Public Member Functions

- [Reading](#) (const [qsense::QString](#) &k, const [qsense::QString](#) &v, const [qsense::QString](#) &ts=[qsense::net::DateTime::singleton\(\).currentTime\(\)](#))
Create a new reading with specified values.
- [Reading](#) (const [qsense::QString](#) &k, float v, const [qsense::QString](#) &ts=[qsense::net::DateTime::singleton\(\).currentTime\(\)](#))
Create a new reading with specified values.
- [~Reading](#) ()
Destructor. No actions required.
- const [qsense::QString](#) & [getKey](#) () const
Return the key for the reading.
- const [qsense::QString](#) & [getValue](#) () const
Return the value of the reading.
- const [qsense::QString](#) & [getTimestamp](#) () const
Return the time at which the reading was taken.
- const [qsense::QString](#) [toString](#) () const
Return a JSON representation of the reading.

7.10.1 Detailed Description

A class that represents a single reading. Readings are added to an [Event](#).

7.10.2 Constructor & Destructor Documentation

7.10.2.1 qsense::Reading::Reading (const qsense::QString & k, const qsense::QString & v, const qsense::QString & ts = qsense::net::DateTime::singleton().currentTime()) [inline]

Create a new reading with specified values.

Parameters

<i>k</i>	The key to associate with the reading
<i>v</i>	The value of the reading
<i>ts</i>	The timestamp (optional) at which reading was taken.

7.10.2.2 `qsense::Reading::Reading (const qsense::QString & k, float v, const qsense::QString & ts = qsense::net::DateTime::singleton().currentTime())`

Create a new reading with specified values.

Parameters

<i>k</i>	The key to associate with the reading
<i>v</i>	The float value of the reading
<i>ts</i>	The timestamp (optional) at which reading was taken.

7.10.2.3 qsense::Reading::~~Reading () [inline]

Destructor. No actions required.

7.10.3 Member Function Documentation

7.10.3.1 const qsense::QString& qsense::Reading::getKey () const [inline]

Return the key for the reading.

7.10.3.2 const qsense::QString& qsense::Reading::getTimestamp () const [inline]

Return the time at which the reading was taken.

7.10.3.3 const qsense::QString& qsense::Reading::getValue () const [inline]

Return the value of the reading.

7.10.3.4 const qsense::QString qsense::Reading::toString () const

Return a JSON representation of the reading.

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

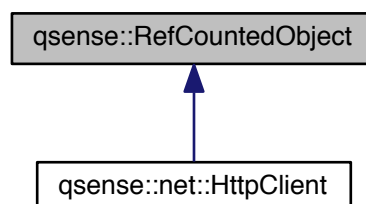
- /Users/rakesh/svn/customer/qsense/desktop/src/api/Reading.h

7.11 qsense::RefCountedObject Class Reference

A base class for objects that employ reference counting based garbage collection.

```
#include <RefCountedObject.h>
```

Inheritance diagram for qsense::RefCountedObject:



Public Member Functions

- [RefCountedObject](#) ()
Creates the [RefCountedObject](#). The initial reference count is one.
- void [duplicate](#) () const
Increments the object's reference count.
- void [release](#) () const
Decrements the object's reference count and deletes the object if the count reaches zero.
- int [referenceCount](#) () const
Returns the reference count.

Protected Member Functions

- virtual [~RefCountedObject](#) ()
Destroys the [RefCountedObject](#).

7.11.1 Detailed Description

A base class for objects that employ reference counting based garbage collection.
Reference-counted objects inhibit construction by copying and assignment.

7.11.2 Constructor & Destructor Documentation

7.11.2.1 `qsense::RefCountedObject::RefCountedObject () [inline]`

Creates the [RefCountedObject](#). The initial reference count is one.

7.11.2.2 `virtual qsense::RefCountedObject::~~RefCountedObject () [inline],[protected],[virtual]`

Destroys the [RefCountedObject](#).

7.11.3 Member Function Documentation

7.11.3.1 `void qsense::RefCountedObject::duplicate () const [inline]`

Increments the object's reference count.

7.11.3.2 `int qsense::RefCountedObject::referenceCount () const [inline]`

Returns the reference count.

7.11.3.3 `void qsense::RefCountedObject::release () const [inline]`

Decrements the object's reference count and deletes the object if the count reaches zero.

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/RefCountedObject.h`

7.12 qsense::hash::Sha1 Class Reference

Class for hashing using SHA1 algorithm.

```
#include <Sha1.h>
```

Classes

- struct [Context](#)
SHA1 context representation.

Public Member Functions

- [Sha1](#) ()
Default constructor.
- [~Sha1](#) ()
Destructor. No actions required.
- void [hash](#) (unsigned char *input, int ilen, unsigned char output[20])
Generate SHA1 hash for specified input into output array.
- [qsense::QString hash](#) (const [qsense::QString](#) &input)
Generate SHA1 hash for the specified input string.
- void [hmac](#) (unsigned char *key, int keylen, unsigned char *input, int ilen, unsigned char output[20])
Generate SHA1 HMAC for the specified input using specified key.
- [qsense::QString hmac](#) (const [qsense::QString](#) &key, const [qsense::QString](#) &input)
Generate SHA1 HMAC using the specified key for the input string.
- [qsense::QString sign](#) (const [qsense::QString](#) &privateKey, const [qsense::QString](#) &httpMethod, const [qsense::QString](#) &uriPath, const [qsense::QString](#) &date, const [qsense::QString](#) &contentMd5, const [qsense::QString](#) &signatureVersion=[qsense::QString](#)("1"))
Generate the signature for the Sidecar Authorization header.

7.12.1 Detailed Description

Class for hashing using SHA1 algorithm.

7.12.2 Constructor & Destructor Documentation

7.12.2.1 qsense::hash::Sha1::Sha1 ()

Default constructor.

7.12.2.2 qsense::hash::Sha1::~~Sha1 () [inline]

Destructor. No actions required.

7.12.3 Member Function Documentation

7.12.3.1 void qsense::hash::Sha1::hash (unsigned char * input, int ilen, unsigned char output[20])

Generate SHA1 hash for specified input into output array.

Parameters

<i>input</i>	The input char array that is to be hashed.
<i>ilen</i>	The length of the input char array.
<i>output</i>	The output char array into which hash value is written.

7.12.3.2 `qsense::QString qsense::hash::Sha1::hash (const qsense::QString & input)`

Generate SHA1 hash for the specified input string.

7.12.3.3 `void qsense::hash::Sha1::hmac (unsigned char * key, int keylen, unsigned char * input, int ilen, unsigned char output[20])`

Generate SHA1 HMAC for the specified input using specified key.

Parameters

<i>key</i>	The key to use to generate the HMAC
<i>keylen</i>	The length of the key
<i>input</i>	The input char array to hash
<i>ilen</i>	The length of the input char array
<i>output</i>	The output char array into which hash value is written.

7.12.3.4 `qsense::QString qsense::hash::Sha1::hmac (const qsense::QString & key, const qsense::QString & input)`

Generate SHA1 HMAC using the specified key for the input string.

7.12.3.5 `qsense::QString qsense::hash::Sha1::sign (const qsense::QString & privateKey, const qsense::QString & httpMethod, const qsense::QString & uriPath, const qsense::QString & date, const qsense::QString & contentMd5, const qsense::QString & signatureVersion = qsense::QString ("1"))`

Generate the signature for the Sidecar Authorization header.

Parameters

<i>privateKey</i>	The api secret to use to sign
<i>httpMethod</i>	The HTTP method used for the Sidecar API interaction
<i>uriPath</i>	The URI path with which to interact
<i>date</i>	The current timestamp
<i>contentMd5</i>	The MD5 hash for the content to be submitted to Sidecar
<i>signatureVersion</i>	The signature version to specify in header

Returns

The Base64 encoded authorisation signature

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

- `/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Sha1.h`

7.13 `qsense::net::SidecarClient` Class Reference

Class that encapsulates interactions with the Sidecar REST API.

```
#include <SidecarClient.h>
```

Classes

- struct [UserResponse](#)
A simple structure that represents the result of a user provisioning request.

Public Member Functions

- [UserResponse createUser](#) (const [QString](#) &username, const [QString](#) &password)
Create a new user account with Sidecar. This is usually the first interaction with the Sidecar service. Needed only once per application.
- [UserResponse createOrRetrieveAccessKeys](#) (const [QString](#) &username, const [QString](#) &password)
Create or retrieve application access keys for the specified user.
- [UserResponse authenticate](#) (const [QString](#) &username, const [QString](#) &password)
Authenticate the user against Sidecar. Return the existing user key/secret pair to use with the events API.
- [int16_t deleteUser](#) (const [QString](#) &username, const [QString](#) &password)
deleteUser Deprovision a user from the system. Removes the user account, access key/secret and devices associated with the user.
- [bool publish](#) (const [Event](#) &event) const
Publish the specified event to the Sidecar [Event](#) API.

Static Public Member Functions

- static void [initAPIKey](#) (const [QString](#) &apiKey, const [QString](#) &apiSecret)
Initialise the API with the API key and secret used to sign provisioning requests.
- static void [initUserKey](#) (const [QString](#) &userKey, const [QString](#) &userSecret)
Initialise the API with the user key and secret used to sign event requests.

7.13.1 Detailed Description

Class that encapsulates interactions with the Sidecar REST API.

7.13.2 Member Function Documentation

7.13.2.1 [UserResponse qsense::net::SidecarClient::authenticate](#) (const [QString](#) & username, const [QString](#) & password)

Authenticate the user against Sidecar. Return the existing user key/secret pair to use with the events API.

Parameters

<i>username</i>	The username of the user to authenticate as
<i>password</i>	The password to use to authenticate

Returns

The response which on success will contain the key/secret pair

7.13.2.2 [UserResponse qsense::net::SidecarClient::createOrRetrieveAccessKeys](#) (const [QString](#) & username, const [QString](#) & password)

Create or retrieve application access keys for the specified user.

Parameters

<i>username</i>	The username preferred by user (email format)
<i>password</i>	The password to associate with user account (8-20 char length)

Returns

Return a [UserResponse](#) struct with key/secret pair populated on success.

7.13.2.3 `UserResponse qsense::net::SidecarClient::createUser (const QString & username, const QString & password)`

Create a new user account with Sidecar. This is usually the first interaction with the Sidecar service. Needed only once per application.

If the method returns with empty key/secret pair, it generally indicates that the username is taken or username/password failed format/length rules.

Parameters

<i>username</i>	The username preferred by user (email format)
<i>password</i>	The password to associate with user account (8-20 char length)

Returns

Return a [UserResponse](#) struct with key/secret pair populated on success.

7.13.2.4 `int16_t qsense::net::SidecarClient::deleteUser (const QString & username, const QString & password)`

`deleteUser` Deprovision a user from the system. Removes the user account, access key/secret and devices associated with the user.

Parameters

<i>username</i>	The username of the user account
<i>password</i>	The password for the user account.

Returns

The HTTP response code returned by Sidecar. Response code 204 indicates success.

7.13.2.5 `static void qsense::net::SidecarClient::initAPIKey (const QString & apiKey, const QString & apiSecret)` [static]

Initialise the API with the API key and secret used to sign provisioning requests.

7.13.2.6 `static void qsense::net::SidecarClient::initUserKey (const QString & userKey, const QString & userSecret)` [static]

Initialise the API with the user key and secret used to sign event requests.

7.13.2.7 `bool qsense::net::SidecarClient::publish (const Event & event) const`

Publish the specified event to the Sidecar [Event](#) API.

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

- /Users/rakesh/svn/customer/qsense/desktop/src/api/net/[SidecarClient.h](#)

7.14 SimpleSidecarClient Class Reference

A simple client implementation that hides the low-level API.

```
#include <SimpleSidecarClient.h>
```

Classes

- struct [UserResponse](#)

A simple data structure that represents the response from Sidecar Provisioning API.

Public Types

- enum [NetworkType](#) { [Ethernet](#) = 0, [WiFi](#) = 1 }

Enumeration of network connection types for device.

Public Member Functions

- [SimpleSidecarClient](#) ()
- [UserResponse authenticate](#) (const String &username, const String &password)
Authenticate the user against Sidecar. Return the existing user key/secret pair to use with the events API.
- [UserResponse createUser](#) (const String &username, const String &password)
*Create a new user account with Sidecar. Use this on first run of application if the [authenticate](#) method returned an invalid (not 200) *responseCode*.*
- [UserResponse createOrRetrieveAccessKeys](#) (const String &username, const String &password)
Create or retrieve application access keys for the specified user.
- [int16_t deleteUser](#) (const String &username, const String &password)
deleteUser Deprovision a user from the system. Removes the user account, access key/secret and devices associated with the user.
- [void addReading](#) (const String &key, const float value)
Add the specified reading key-value pair to an event. Add as many readings as desired before publishing the event to Sidecar ([publish](#)). On publish, the event is re-initialised for publishing subsequent readings.
- [void addTag](#) (const String &value)
Add optional tag values to help analyse the event after publishing to Sidecar.
- [void addKeyTag](#) (const String &key, const String &tag)
Add option key-tag values to help identify/analyse the event after publishing to Sidecar. Use the same key to assign multiple values to a key.
- [bool publish](#) ()
publish Publish the built up event to the Sidecar Event API. Invoke [addReading](#) with the individual readings that are part of the current event, and [addTag](#) as needed to build up a complete event before publishing to Sidecar.
- [const String currentTime](#) ()
Return the current date/time in ISO 8601 format.
- [const String date](#) ()
Return the current date in ISO 8601 format.
- [int64_t currentTimeMillis](#) ()
Return the milli seconds since UNIX epoch.

Static Public Member Functions

- static void `initNetworkType` (`NetworkType` type)
Initialise the API to use the specified type.
- static void `initUUID` (byte mac[6])
- static void `initUUID` ()
Initialise UUID engine using a random seed.
- static void `initAPIKey` (const String &apiKey, const String &apiSecret)
- static void `initUserKey` (const String &userKey, const String &userSecret)
- static void `initEventAPI` (const String &streamId, const String &deviceUUID, const float latitude, const float longitude)
Initialise the Sidecar Event API.

7.14.1 Detailed Description

A simple client implementation that hides the low-level API.

The low-level API is a cross-platform standard C++ API that has been tested on Mac OS X and Windows in addition to Arduino Mega. The simple client is specific to Arduino and is intended to provide a single class that Arduino applications may use to provision devices and publish event data.

The methods in this class are declared in the same order that a typical calling application will need to make to interact with Sidecar.

7.14.2 Member Enumeration Documentation

7.14.2.1 enum `SimpleSidecarClient::NetworkType`

Enumeration of network connection types for device.

Enumerator

Ethernet

WiFi

7.14.3 Constructor & Destructor Documentation

7.14.3.1 `SimpleSidecarClient::SimpleSidecarClient ()` [`inline`]

7.14.4 Member Function Documentation

7.14.4.1 `void SimpleSidecarClient::addKeyTag (const String & key, const String & tag)`

Add option key-tag values to help identify/analyse the event after publishing to Sidecar. Use the same key to assign multiple values to a key.

NOTE: Tags should be single words without spaces.

Parameters

<i>key</i>	The key for the key-tag pair.
<i>tag</i>	A tag value to associate with the key.

7.14.4.2 void SimpleSidecarClient::addReading (const String & *key*, const float *value*)

Add the specified reading key-value pair to an event. Add as many readings as desired before publishing the event to Sidecar ([publish](#)). On publish, the event is re-initialised for publishing subsequent readings.

Parameters

<i>key</i>	A user defined key for the reading
<i>value</i>	The value for the reading.

7.14.4.3 void SimpleSidecarClient::addTag (const String & value)

Add optional tag values to help analyse the event after publishing to Sidecar.

NOTE: Tags should be single words without spaces.

Parameters

<i>value</i>	A tag value.
--------------	--------------

7.14.4.4 UserResponse SimpleSidecarClient::authenticate (const String & username, const String & password)

Authenticate the user against Sidecar. Return the existing user key/secret pair to use with the events API.

This is generally the first call to use on first run of the application. Use `authenticate` before `createUser` to ensure that the account name (email id) and password are not already in use.

If the response contains a valid (non-empty) keyId and secret, calling applications may chose to save it to flash storage using `PROGMEM`. Once stored the provisioning process is complete, and the application may interact directly with the Event API methods. On each run of the application invoke `initUserKey` with the stored user key and secret.

Parameters

<i>username</i>	The username of the user to authenticate as
<i>password</i>	The password to use to authenticate

Returns

The response which on success will contain the key/secret pair. In case of failure the `responseCode` value will be other than 200.

7.14.4.5 UserResponse SimpleSidecarClient::createOrRetrieveAccessKeys (const String & username, const String & password)

Create or retrieve application access keys for the specified user.

Parameters

<i>username</i>	The username preferred by user (email format)
<i>password</i>	The password to associate with user account (8-20 char length)

Returns

Return a `UserResponse` struct with key/secret pair populated on success. The `responseCode` value will be 200 on success.

7.14.4.6 UserResponse SimpleSidecarClient::createUser (const String & username, const String & password)

Create a new user account with Sidecar. Use this on first run of application if the `authenticate` method returned an invalid (not 200) `responseCode`.

If the method returns with empty key/secret pair, it generally indicates that the username is taken or username/password failed format/length rules.

Parameters

<i>username</i>	The username preferred by user (email format)
<i>password</i>	The password to associate with user account (8-20 char length)

Returns

Return a [UserResponse](#) struct with key/secret pair populated on success.

7.14.4.7 `const String SimpleSidecarClient::currentTime ()`

Return the current date/time in ISO 8601 format.

7.14.4.8 `int64_t SimpleSidecarClient::currentTimeMillis ()`

Return the milli seconds since UNIX epoch.

7.14.4.9 `const String SimpleSidecarClient::date ()`

Return the current date in ISO 8601 format.

7.14.4.10 `int16_t SimpleSidecarClient::deleteUser (const String & username, const String & password)`

`deleteUser` Deprovision a user from the system. Removes the user account, access key/secret and devices associated with the user.

Parameters

<i>username</i>	The username of the user account
<i>password</i>	The password for the user account.

Returns

The HTTP response code returned by Sidecar. Response code 204 indicates success.

7.14.4.11 `static void SimpleSidecarClient::initAPIKey (const String & apiKey, const String & apiSecret) [static]`

Initialise the API with the API key and secret used to sign provisioning requests. This is usually the first step in initialising the API for a device. Users must register their application with Sidecar and specify the generated API access key and secret.

Calling applications will generally store the API key and secret in flash storage using `PROGMEM` and use that to initialise the API on each run of the application.

7.14.4.12 `static void SimpleSidecarClient::initEventAPI (const String & streamId, const String & deviceUUID, const float latitude, const float longitude) [static]`

Initialise the Sidecar Event API.

Parameters

<i>streamId</i>	The user defined stream name
<i>deviceUUID</i>	The device identifier for the hardware, this value should be considered static (e.g., a MAC Address).
<i>latitude</i>	Latitude for current device location
<i>longitude</i>	Longitude for current device location

7.14.4.13 `static void SimpleSidecarClient::initNetworkType (NetworkType type) [static]`

Initialise the API to use the specified type.

7.14.4.14 `static void SimpleSidecarClient::initUserKey (const String & userKey, const String & userSecret) [static]`

Initialise the API with the user key and secret used to sign event requests. This step can be performed after provisioning a user account for a device. Use the provisioning API

Calling applications will generally store the user access key and secret in flash storage using `PROGMEM` and use that to initialise the API on each run of the application.

7.14.4.15 `static void SimpleSidecarClient::initUUID (byte mac[6]) [static]`

Initialise UUID engine. If using WiFi, the WiFi api provides a way to look up current MAC address. That would be better to get proper UUID values.

7.14.4.16 `static void SimpleSidecarClient::initUUID () [static]`

Initialise UUID engine using a random seed.

7.14.4.17 `bool SimpleSidecarClient::publish ()`

publish Publish the built up event to the Sidecar Event API. Invoke [addReading](#) with the individual readings that are part of the current event, and [addTag](#) as needed to build up a complete event before publishing to Sidecar.

Returns

Returns `true` if publish succeeded.

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

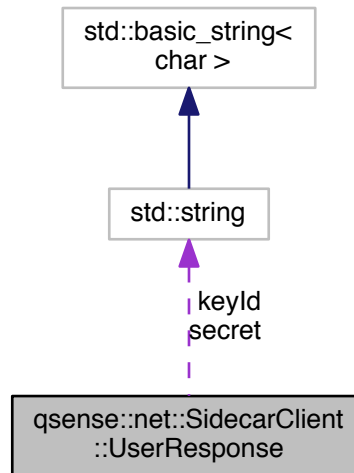
- [/Users/rakesh/svn/customer/qsense/desktop/src/api/SimpleSidecarClient.h](#)

7.15 qsense::net::SidecarClient::UserResponse Struct Reference

A simple structure that represents the result of a user provisioning request.

```
#include <SidecarClient.h>
```

Collaboration diagram for qsense::net::SidecarClient::UserResponse:



Public Member Functions

- [UserResponse](#) (uint16_t response, const [QString](#) &key=[QString](#)(), const [QString](#) &sec=[QString](#)())
Create a new [UserResponse](#) instance.

Static Public Member Functions

- static const [UserResponse](#) create (uint16_t response, const [QString](#) &body)
Create a new [UserResponse](#) instance and populate the key and secret by parsing the response body.

Public Attributes

- uint16_t [responseCode](#)
- const [QString](#) [keyId](#)
- const [QString](#) [secret](#)

7.15.1 Detailed Description

A simple structure that represents the result of a user provisioning request.

7.15.2 Constructor & Destructor Documentation

- 7.15.2.1 `qsense::net::SidecarClient::UserResponse::UserResponse (uint16_t response, const QString & key = QString () , const QString & sec = QString ()) [inline]`

Create a new [UserResponse](#) instance.

7.15.3 Member Function Documentation

7.15.3.1 `static const UserResponse qsense::net::SidecarClient::UserResponse::create (uint16_t response, const QString & body) [static]`

Create a new [UserResponse](#) instance and populate the key and secret by parsing the response body.

7.15.4 Member Data Documentation

7.15.4.1 `const QString qsense::net::SidecarClient::UserResponse::keyId`

7.15.4.2 `uint16_t qsense::net::SidecarClient::UserResponse::responseCode`

7.15.4.3 `const QString qsense::net::SidecarClient::UserResponse::secret`

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

- [/Users/rakesh/svn/customer/qsense/desktop/src/api/net/SidecarClient.h](#)

7.16 SimpleSidecarClient::UserResponse Struct Reference

A simple data structure that represents the response from Sidecar Provisioning API.

```
#include <SimpleSidecarClient.h>
```

Public Member Functions

- [UserResponse](#) (uint16_t response, const String &key, const String &sec)
Create a new instance of the data structure.

Public Attributes

- const uint16_t [responseCode](#)
The HTTP response code returned by the Sidecar Provisioning API.
- const String [keyId](#)
The user access key value.
- const String [secret](#)
The user access secret value.

7.16.1 Detailed Description

A simple data structure that represents the response from Sidecar Provisioning API.

7.16.2 Constructor & Destructor Documentation

7.16.2.1 `SimpleSidecarClient::UserResponse::UserResponse (uint16_t response, const String & key, const String & sec) [inline]`

Create a new instance of the data structure.

7.16.3 Member Data Documentation

7.16.3.1 const String SimpleSidecarClient::UserResponse::keyId

The user access key value.

7.16.3.2 const uint16_t SimpleSidecarClient::UserResponse::responseCode

The HTTP response code returned by the Sidecar Provisioning API.

7.16.3.3 const String SimpleSidecarClient::UserResponse::secret

The user access secret value.

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

- /Users/rakesh/svn/customer/qsense/desktop/src/api/[SimpleSidecarClient.h](#)

7.17 qsense::UUID Class Reference

A class that represents a UUID/GUID.

```
#include <UUID.h>
```

Public Types

- enum [Version](#) { [UUID_TIME_BASED](#) = 0x01, [UUID_DCE_UUID](#) = 0x02, [UUID_NAME_BASED](#) = 0x03, [UUID_RANDOM](#) = 0x04 }

Public Member Functions

- [UUID](#) ()
Creates a nil (all zero) [UUID](#).
- [UUID](#) (const [UUID](#) &uuid)
Copy constructor.
- [UUID](#) (const [QString](#) &uuid)
Parses the [UUID](#) from a string.
- [UUID](#) (const char *uuid)
Parses the [UUID](#) from a char array.
- [~UUID](#) ()
Destroys the [UUID](#).
- [UUID](#) & [operator=](#) (const [UUID](#) &uuid)
Assignment operator.
- bool [parse](#) (const [QString](#) &uuid)
Tries to interpret the given string as an [UUID](#).
- [QString](#) [toString](#) () const
Returns a string representation of the [UUID](#) consisting of groups of hexadecimal digits separated by hyphens.
- void [copyFrom](#) (const char *buffer)
Copies the [UUID](#) (16 bytes) from a buffer or byte array. The [UUID](#) fields are expected to be stored in network byte order.
- void [copyTo](#) (char *buffer) const

Copies the [UUID](#) to the buffer. The fields are in network byte order. The buffer need not be aligned.

- [Version version](#) () const
Returns the version of the [UUID](#).
- int [variant](#) () const
Returns the variant number of the [UUID](#):
- bool [operator==](#) (const [UUID](#) &uuid) const
- bool [operator!=](#) (const [UUID](#) &uuid) const
- bool [operator<](#) (const [UUID](#) &uuid) const
- bool [operator<=](#) (const [UUID](#) &uuid) const
- bool [operator>](#) (const [UUID](#) &uuid) const
- bool [operator>=](#) (const [UUID](#) &uuid) const
- bool [isNull](#) () const

Static Public Member Functions

- static const [UUID](#) & [null](#) ()
Returns a null/nil [UUID](#).
- static const [UUID](#) & [dns](#) ()
Returns the namespace identifier for the DNS namespace.
- static const [UUID](#) & [uri](#) ()
Returns the namespace identifier for the URI (former URL) namespace.
- static const [UUID](#) & [oid](#) ()
Returns the namespace identifier for the OID namespace.
- static const [UUID](#) & [x500](#) ()
Returns the namespace identifier for the X500 namespace.
- static const [UUID](#) [create](#) ()
Generate a time based [UUID](#) instance.
- static void [init](#) (uint8_t node[6])
Initialise the [UUID](#) engine. On application start, invoke with the current MAC address.

Protected Member Functions

- [UUID](#) (uint32_t timeLow, uint32_t timeMid, uint32_t timeHiAndVersion, uint16_t clockSeq, uint8_t node[6])
- [UUID](#) (const char *bytes, [Version version](#))
- int [compare](#) (const [UUID](#) &uuid) const
- void [fromNetwork](#) ()
- void [toNetwork](#) ()

Static Protected Member Functions

- static void [appendHex](#) (QString &str, uint8_t n)
- static void [appendHex](#) (QString &str, uint16_t n)
- static void [appendHex](#) (QString &str, uint32_t n)
- static uint8_t [nibble](#) (char hex)
- static uint32_t [randomNumber](#) (int32_t input)

7.17.1 Detailed Description

A class that represents a UUID/GUID.

A **UUID** is an identifier that is unique across both space and time, with respect to the space of all UUIDs. Since a **UUID** is a fixed size and contains a time field, it is possible for values to rollover (around A.D. 3400, depending on the specific algorithm used). A **UUID** can be used for multiple purposes, from tagging objects with an extremely short lifetime, to reliably identifying very persistent objects across a network.

This class implements a Universal Unique Identifier, as specified in Appendix A of the DCE 1.1 Remote Procedure Call Specification (<http://www.opengroup.org/onlinepubs/9629399/>), RFC 2518 (WebDAV), section 6.4.1 and the UUIDs and GUIDs internet draft by Leach/Salz from February, 1998 (<http://www.ics.uci.edu/~ejw/authoring/uuid-guid/draft-leach-uuids-guids-01.txt>) and also <http://tools.ietf.org/html/draft-mealling-uuid-urn-05>

7.17.2 Member Enumeration Documentation

7.17.2.1 enum qsense::UUID::Version

Enumerator

UUID_TIME_BASED
UUID_DCE_UID
UUID_NAME_BASED
UUID_RANDOM

7.17.3 Constructor & Destructor Documentation

7.17.3.1 qsense::UUID::UUID ()

Creates a nil (all zero) **UUID**.

7.17.3.2 qsense::UUID::UUID (const UUID & uuid)

Copy constructor.

7.17.3.3 qsense::UUID::UUID (const QString & uuid) [explicit]

Parses the **UUID** from a string.

7.17.3.4 qsense::UUID::UUID (const char * uuid) [explicit]

Parses the **UUID** from a char array.

7.17.3.5 qsense::UUID::~~UUID ()

Destroys the **UUID**.

7.17.3.6 qsense::UUID::UUID (uint32_t timeLow, uint32_t timeMid, uint32_t timeHiAndVersion, uint16_t clockSeq, uint8_t node[6]) [protected]

7.17.3.7 qsense::UUID::UUID (const char * bytes, Version version) [protected]

7.17.4 Member Function Documentation

7.17.4.1 `static void qsense::UUID::appendHex (QString & str, uint8_t n)` `[static]`, `[protected]`

7.17.4.2 `static void qsense::UUID::appendHex (QString & str, uint16_t n)` `[static]`, `[protected]`

7.17.4.3 `static void qsense::UUID::appendHex (QString & str, uint32_t n)` `[static]`, `[protected]`

7.17.4.4 `int qsense::UUID::compare (const UUID & uuid) const` `[protected]`

7.17.4.5 `void qsense::UUID::copyFrom (const char * buffer)`

Copies the `UUID` (16 bytes) from a buffer or byte array. The `UUID` fields are expected to be stored in network byte order.

Parameters

<i>buffer</i>	The buffer need not be aligned.
---------------	---------------------------------

7.17.4.6 `void qsense::UUID::copyTo (char * buffer) const`

Copies the `UUID` to the buffer. The fields are in network byte order. The buffer need not be aligned.

Parameters

<i>buffer</i>	There must be room for at least 16 bytes.
---------------	---

7.17.4.7 `static const UUID qsense::UUID::create ()` `[static]`

Generate a time based `UUID` instance.

7.17.4.8 `static const UUID& qsense::UUID::dns ()` `[static]`

Returns the namespace identifier for the DNS namespace.

7.17.4.9 `void qsense::UUID::fromNetwork ()` `[protected]`

7.17.4.10 `static void qsense::UUID::init (uint8_t node[6])` `[static]`

Initialise the `UUID` engine. On application start, invoke with the current MAC address.

Parameters

<i>node</i>	The MAC address.
-------------	------------------

7.17.4.11 `bool qsense::UUID::isNull () const` `[inline]`

Returns

Returns true if the `UUID` is nil (in other words, consists of all zeros).

7.17.4.12 `static uint8_t qsense::UUID::nibble (char hex)` `[static]`, `[protected]`

7.17.4.13 `static const UUID& qsense::UUID::null () [static]`

Returns a null/nil [UUID](#).

7.17.4.14 `static const UUID& qsense::UUID::oid () [static]`

Returns the namespace identifier for the OID namespace.

7.17.4.15 `bool qsense::UUID::operator!= (const UUID & uuid) const [inline]`

7.17.4.16 `bool qsense::UUID::operator< (const UUID & uuid) const [inline]`

7.17.4.17 `bool qsense::UUID::operator<= (const UUID & uuid) const [inline]`

7.17.4.18 `UUID& qsense::UUID::operator= (const UUID & uuid)`

Assignment operator.

7.17.4.19 `bool qsense::UUID::operator== (const UUID & uuid) const [inline]`

7.17.4.20 `bool qsense::UUID::operator> (const UUID & uuid) const [inline]`

7.17.4.21 `bool qsense::UUID::operator>= (const UUID & uuid) const [inline]`

7.17.4.22 `bool qsense::UUID::parse (const QString & uuid)`

Tries to interpret the given string as an [UUID](#).

Parameters

<i>uuid</i>	The value to parse
-------------	--------------------

Returns

If the [UUID](#) is syntactically valid, assigns the members and returns true. Otherwise leaves the object unchanged and returns false.

7.17.4.23 `static uint32_t qsense::UUID::randomNumber (int32_t input) [static], [protected]`

7.17.4.24 `void qsense::UUID::toNetwork () [protected]`

7.17.4.25 `QString qsense::UUID::toString () const`

Returns a string representation of the [UUID](#) consisting of groups of hexadecimal digits separated by hyphens.

7.17.4.26 `static const UUID& qsense::UUID::uri () [static]`

Returns the namespace identifier for the URI (former URL) namespace.

7.17.4.27 `int qsense::UUID::variant () const`

Returns the variant number of the [UUID](#):

Returns

- 0 reserved for NCS backward compatibility
- 2 the Leach-Salz variant (used by this class)
- 6 reserved, Microsoft Corporation backward compatibility
- 7 reserved for future definition

7.17.4.28 UUID::Version qsense::UUID::version () const [inline]

Returns the version of the [UUID](#).

7.17.4.29 static const UUID& qsense::UUID::x500 () [static]

Returns the namespace identifier for the X500 namespace.

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

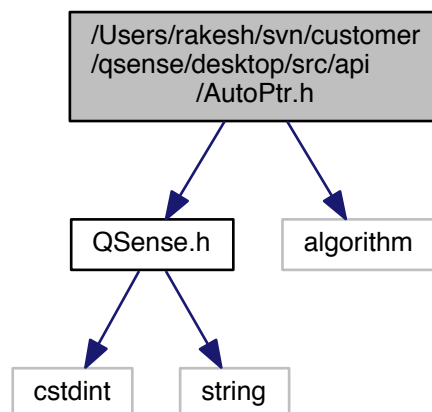
- /Users/rakesh/svn/customer/qsense/desktop/src/api/[UUID.h](#)

Chapter 8

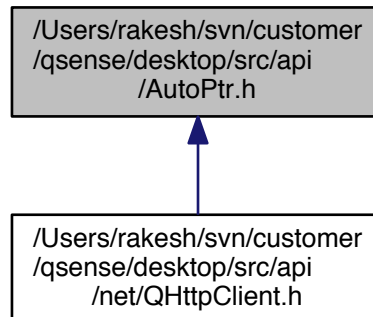
File Documentation

8.1 /Users/rakesh/svn/customer/qsense/desktop/src/api/AutoPtr.h File Reference

```
#include <QSense.h>
#include <algorithm>
Include dependency graph for AutoPtr.h:
```



This graph shows which files directly or indirectly include this file:



Classes

- class `qsense::AutoPtr< C >`

`AutoPtr` is a "smart" pointer for classes implementing reference counting based garbage collection.

Namespaces

- `qsense`

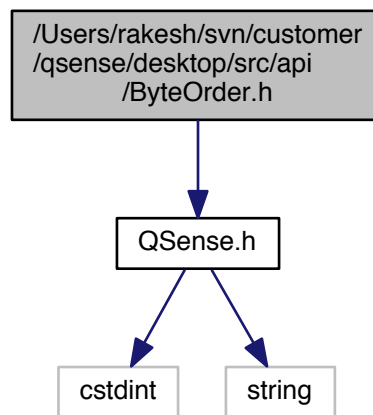
Functions

- `template<class C >`
`void qsense::swap (AutoPtr< C > &p1, AutoPtr< C > &p2)`

8.2 /Users/rakesh/svn/customer/qsense/desktop/src/api/ByteOrder.h File Reference

```
#include <QSense.h>
```

Include dependency graph for ByteOrder.h:



Classes

- class [qsense::ByteOrder](#)

This class contains a number of static methods to convert between big-endian and little-endian integers of various sizes.

Namespaces

- [qsense](#)

Macros

- `#define IMPLEMENT_BYTEORDER_NOOP_(op, type)`
- `#define IMPLEMENT_BYTEORDER_FLIP_(op, type)`
- `#define IMPLEMENT_BYTEORDER_NOOP(op)`
- `#define IMPLEMENT_BYTEORDER_FLIP(op)`
- `#define IMPLEMENT_BYTEORDER_BIG IMPLEMENT_BYTEORDER_FLIP`
- `#define IMPLEMENT_BYTEORDER_LIT IMPLEMENT_BYTEORDER_NOOP`

8.2.1 Macro Definition Documentation

8.2.1.1 `#define IMPLEMENT_BYTEORDER_BIG IMPLEMENT_BYTEORDER_FLIP`

8.2.1.2 `#define IMPLEMENT_BYTEORDER_FLIP(op)`

Value:

```

IMPLEMENT_BYTEORDER_FLIP_(op, int16_t) \
IMPLEMENT_BYTEORDER_FLIP_(op, uint16_t) \
IMPLEMENT_BYTEORDER_FLIP_(op, int32_t) \
IMPLEMENT_BYTEORDER_FLIP_(op, uint32_t) \
IMPLEMENT_BYTEORDER_FLIP_(op, int64_t) \
IMPLEMENT_BYTEORDER_FLIP_(op, uint64_t)
  
```

8.2.1.3 #define IMPLEMENT_BYTEORDER_FLIP_(op, type)

Value:

```
inline type ByteOrder::op(type value) \
{ \
    return flipBytes(value); \
}
```

8.2.1.4 #define IMPLEMENT_BYTEORDER_LIT IMPLEMENT_BYTEORDER_NOOP

8.2.1.5 #define IMPLEMENT_BYTEORDER_NOOP(op)

Value:

```
IMPLEMENT_BYTEORDER_NOOP_(op, int16_t) \
IMPLEMENT_BYTEORDER_NOOP_(op, uint16_t) \
IMPLEMENT_BYTEORDER_NOOP_(op, int32_t) \
IMPLEMENT_BYTEORDER_NOOP_(op, uint32_t) \
IMPLEMENT_BYTEORDER_NOOP_(op, int64_t) \
IMPLEMENT_BYTEORDER_NOOP_(op, uint64_t)
```

8.2.1.6 #define IMPLEMENT_BYTEORDER_NOOP_(op, type)

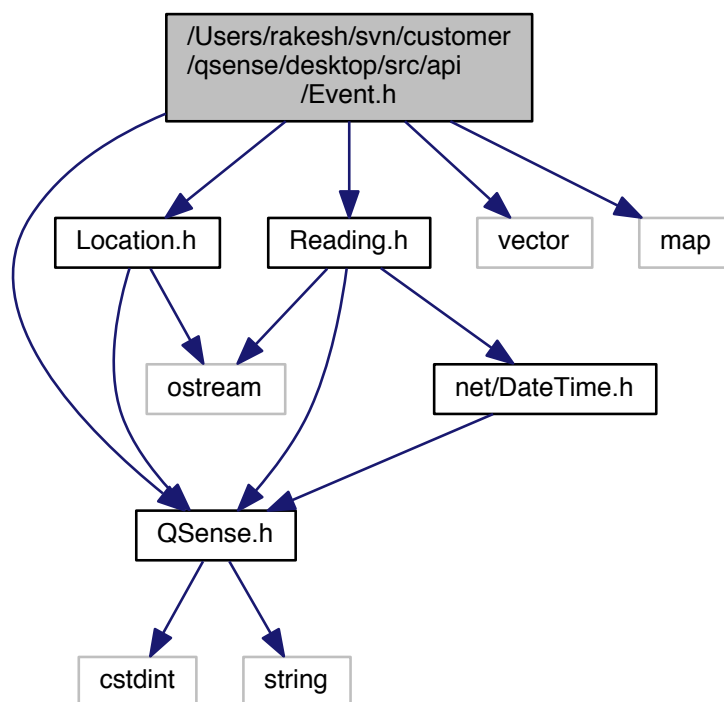
Value:

```
inline type ByteOrder::op(type value) \
{ \
    return value; \
}
```

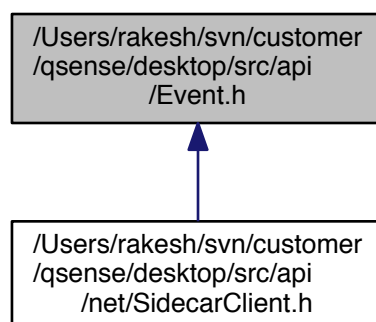
8.3 /Users/rakesh/svn/customer/qsense/desktop/src/api/Event.h File Reference

```
#include <QSense.h>
#include <Location.h>
#include <Reading.h>
#include <vector>
#include <map>
```


Include dependency graph for Event.h:



This graph shows which files directly or indirectly include this file:



Classes

- class [qsense::Event](#)

A simple class that encapsulates an event sent to Sidecar. Events are holders for readings. Events can be serialised to JSON using the [toString](#) method.

Namespaces

- [qsense](#)

Functions

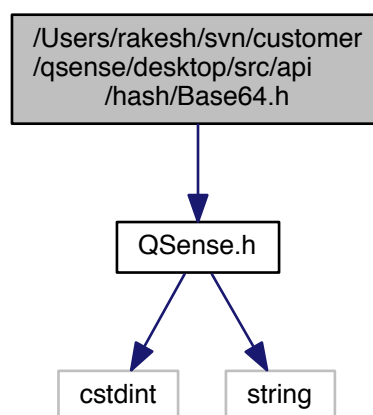
- `std::ostream & qsense::operator<< (std::ostream &os, const Event &event)`

Serialise the specified event as JSON to the output stream.

8.4 /Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Base64.h File Reference

```
#include <QSense.h>
```

Include dependency graph for Base64.h:



Namespaces

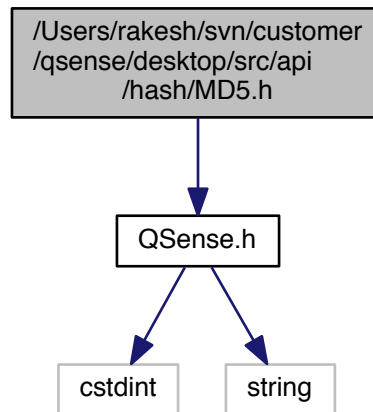
- [qsense](#)
- [qsense::hash](#)
- [qsense::hash::base64](#)

Functions

- `int32_t qsense::hash::base64::encodeLength (int32_t len)`
- `int32_t qsense::hash::base64::encode (char *output, const char *input, int32_t inputLength)`
- `int32_t qsense::hash::base64::decodeLength (const char *code)`
- `int32_t qsense::hash::base64::decode (char *outputPlainText, const char *encoded)`

8.5 /Users/rakesh/svn/customer/qsense/desktop/src/api/hash/MD5.h File Reference

```
#include <QSense.h>  
Include dependency graph for MD5.h:
```



Classes

- class `qsense::hash::MD5`
Class for generating MD5 hashes.

Namespaces

- `qsense`
- `qsense::hash`

Macros

- `#define MD5_HASH_LENGTH 16`

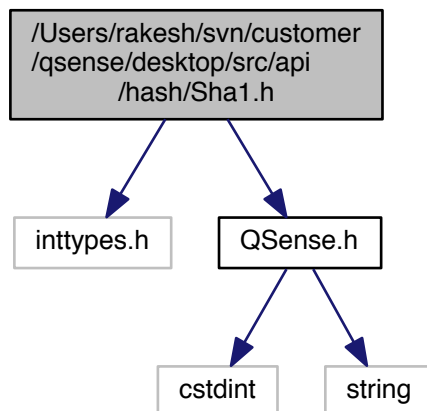
8.5.1 Macro Definition Documentation

8.5.1.1 `#define MD5_HASH_LENGTH 16`

8.6 /Users/rakesh/svn/customer/qsense/desktop/src/api/hash/Sha1.h File Reference

```
#include <inttypes.h>  
#include <QSense.h>
```

Include dependency graph for Sha1.h:



Classes

- class `qsense::hash::Sha1`

Class for hashing using SHA1 algorithm.

- struct `qsense::hash::Sha1::Context`

SHA1 context representation.

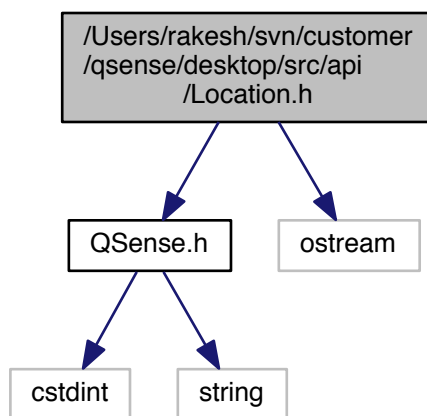
Namespaces

- `qsense`
- `qsense::hash`

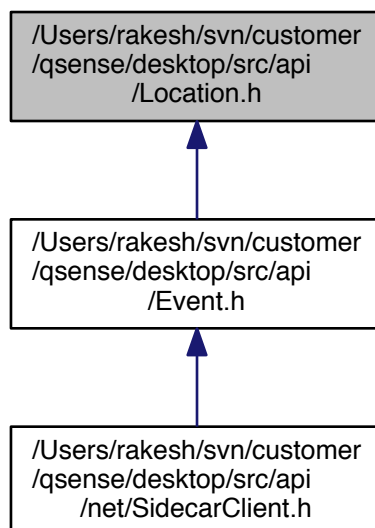
8.7 /Users/rakesh/svn/customer/qsense/desktop/src/api/Location.h File Reference

```
#include <QSense.h>
#include <ostream>
```

Include dependency graph for Location.h:



This graph shows which files directly or indirectly include this file:



Classes

- class `qsense::Location`

A simple representation of geographical location.

Namespaces

- [qsense](#)

Functions

- `std::ostream & qsense::operator<< (std::ostream &os, const qsense::Location &location)`

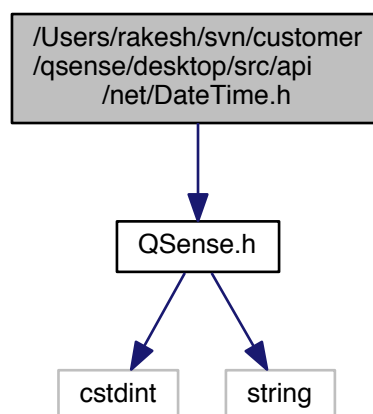
Serialise the specified location to the output stream.

8.8 /Users/rakesh/svn/customer/qsense/desktop/src/api/mainpage.dox File Reference

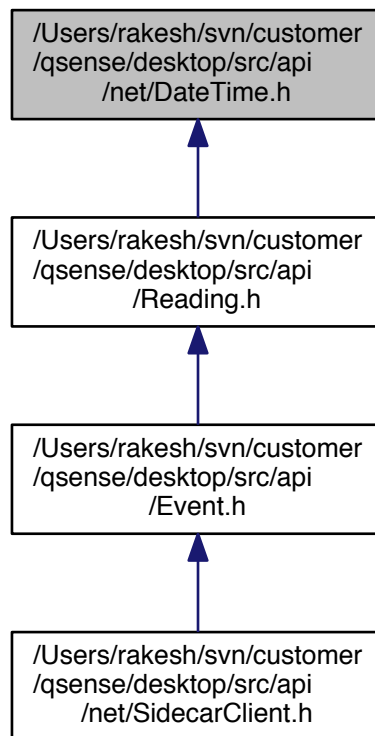
8.9 /Users/rakesh/svn/customer/qsense/desktop/src/api/net/DateTime.h File Reference

```
#include <QSense.h>
```

Include dependency graph for DateTime.h:



This graph shows which files directly or indirectly include this file:



Classes

- class [qsense::net::DateTime](#)

Represents current date/time. Seeds initially (and daily) from a network time service, and uses internal timer to represent a real-time clock.

Namespaces

- [qsense](#)
- [qsense::net](#)

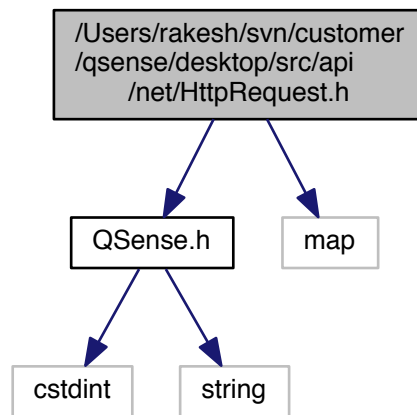
Functions

- `uint32_t qsense::net::millis ()`

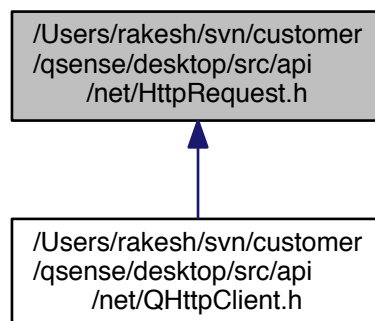
8.10 /Users/rakesh/svn/customer/qsense/desktop/src/api/net/HttpRequest.h File Reference

```
#include <QSense.h>
#include <map>
```

Include dependency graph for HttpRequest.h:



This graph shows which files directly or indirectly include this file:



Classes

- class `qsense::net::HttpRequest`

A simple class that represents a HTTP request. Request encapsulates the URI path, any request parameters, header attributes, body etc. as appropriate.

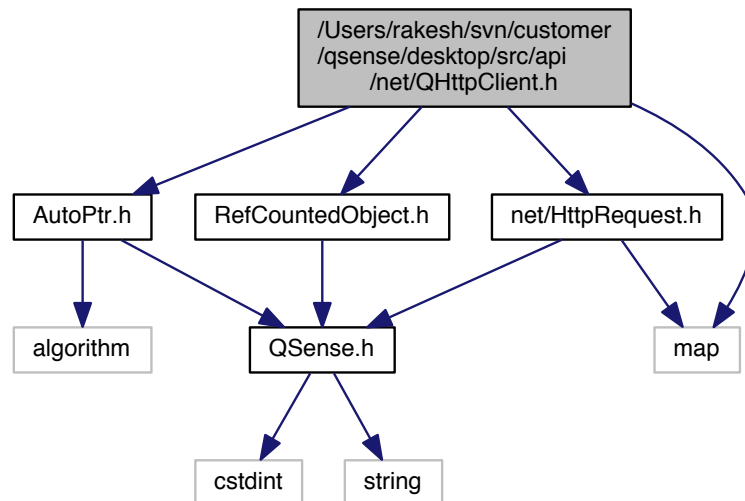
Namespaces

- `qsense`
- `qsense::net`

8.11 /Users/rakesh/svn/customer/qsense/desktop/src/api/net/QHttpClient.h File Reference

```
#include <AutoPtr.h>
#include <RefCountedObject.h>
#include <net/HttpRequest.h>
#include <map>
```

Include dependency graph for QHttpClient.h:



Classes

- class `qsense::net::HttpClient`

A HTTP Client class for use with either ethernet or wifi. Before use, the client should be initialised with the network type used by the device (`qsense::net::initNetworkType`).

Namespaces

- `qsense`
- `qsense::net`

Enumerations

- enum `qsense::net::NetworkType` { `qsense::net::Ethernet` = 0, `qsense::net::WiFi` = 1 }

Enumeration of network connection types for device.

Functions

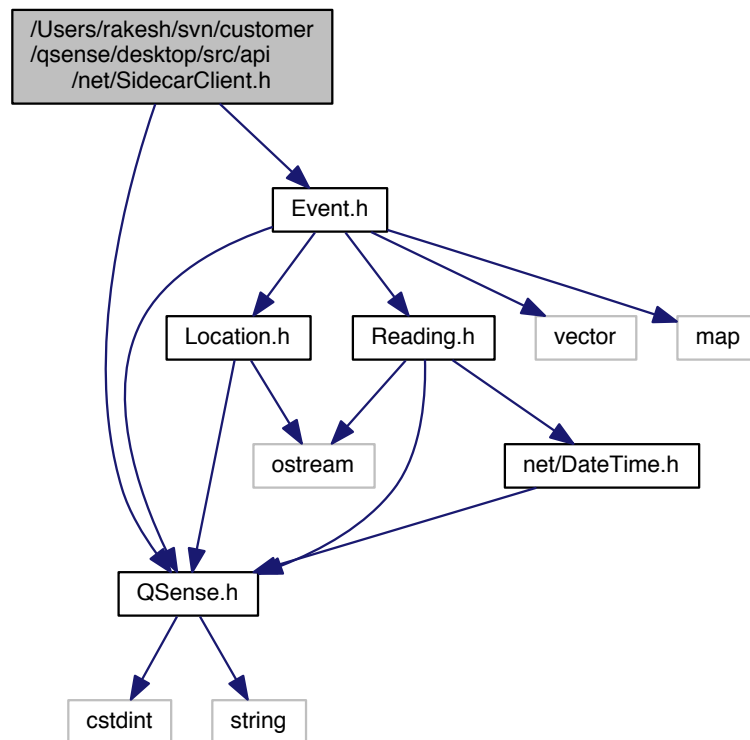
- void `qsense::net::initNetworkType` (NetworkType type)

8.12 /Users/rakesh/svn/customer/qsense/desktop/src/api/net/SidecarClient.h File Reference

```
#include <QSense.h>
```

```
#include <Event.h>
```

Include dependency graph for SidecarClient.h:



Classes

- class [qsense::net::SidecarClient](#)
Class that encapsulates interactions with the Sidecar REST API.
- struct [qsense::net::SidecarClient::UserResponse](#)
A simple structure that represents the result of a user provisioning request.

Namespaces

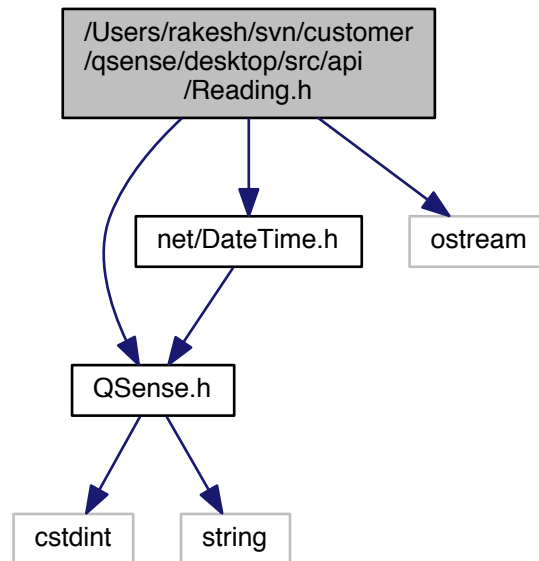
- [qsense](#)
- [qsense::net](#)

8.13 /Users/rakesh/svn/customer/qsense/desktop/src/api/QSense.h File Reference

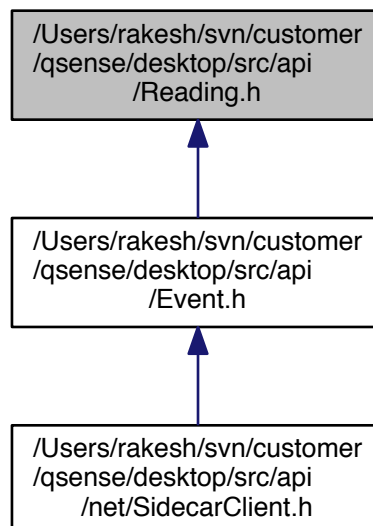
```
#include <cstdint>
```

```
#include <string>
```


Include dependency graph for Reading.h:



This graph shows which files directly or indirectly include this file:



Classes

- class [qsense::Reading](#)

A class that represents a single reading. Readings are added to an [Event](#).

Namespaces

- [qsense](#)

Functions

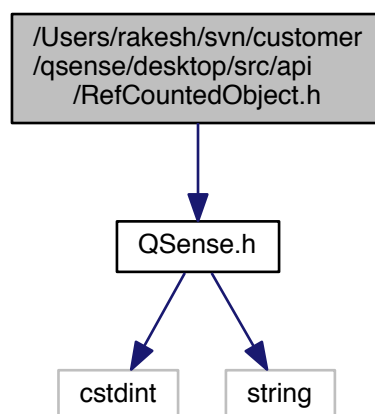
- `std::ostream & qsense::operator<< (std::ostream &os, const qsense::Reading &reading)`

Serialise the reading as JSON to the output stream.

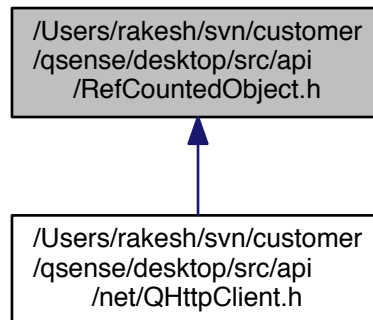
8.15 /Users/rakesh/svn/customer/qsense/desktop/src/api/RefCountedObject.h File Reference

```
#include <QSense.h>
```

Include dependency graph for RefCountedObject.h:



This graph shows which files directly or indirectly include this file:



Classes

- class [qsense::RefCountedObject](#)

A base class for objects that employ reference counting based garbage collection.

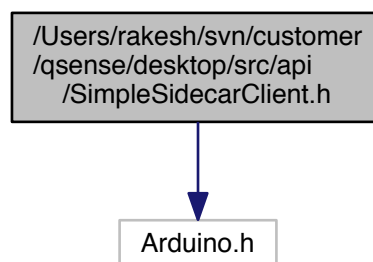
Namespaces

- [qsense](#)

8.16 /Users/rakesh/svn/customer/qsense/desktop/src/api/SimpleSidecarClient.h File Reference

```
#include <Arduino.h>
```

Include dependency graph for SimpleSidecarClient.h:



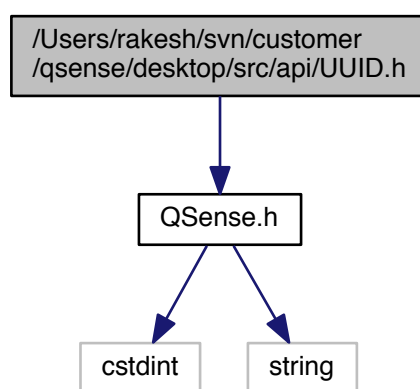
Classes

- class [SimpleSidecarClient](#)
A simple client implementation that hides the low-level API.
- struct [SimpleSidecarClient::UserResponse](#)
A simple data structure that represents the response from Sidecar Provisioning API.

8.17 /Users/rakesh/svn/customer/qsense/desktop/src/api/UUID.h File Reference

```
#include <QSense.h>
```

Include dependency graph for UUID.h:



Classes

- class [qsense::UUID](#)
A class that represents a UUID/GUID.

Namespaces

- [qsense](#)

Index

/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 AutoPtr.h, 63
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 ByteOrder.h, 64
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 Event.h, 66
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 Location.h, 70
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 QSense.h, 76
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 Reading.h, 77
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 RefCountedObject.h, 79
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 SimpleSidecarClient.h, 80
/Users/rakesh/svn/customer/qsense/desktop/src/api/↔
 UUID.h, 81
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/↔
 Base64.h, 68
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/↔
 MD5.h, 69
/Users/rakesh/svn/customer/qsense/desktop/src/api/hash/↔
 Sha1.h, 69
/Users/rakesh/svn/customer/qsense/desktop/src/api/mainpage.↔
 dox, 72
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/↔
 DateTime.h, 72
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/↔
 HttpRequest.h, 73
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/↔
 QHttpClient.h, 75
/Users/rakesh/svn/customer/qsense/desktop/src/api/net/↔
 SidecarClient.h, 76
~AutoPtr
 qsense::AutoPtr, 20
~Event
 qsense::Event, 30
~HttpClient
 qsense::net::HttpClient, 34
~HttpRequest
 qsense::net::HttpRequest, 37
~Location
 qsense::Location, 39
~MD5
 qsense::hash::MD5, 40
~Reading
 qsense::Reading, 43
~RefCountedObject
 qsense::RefCountedObject, 44
~Sha1
 qsense::hash::Sha1, 45
~UUID
 qsense::UUID, 59
add
 qsense::Event, 30
addKeyTag
 SimpleSidecarClient, 50
addReading
 SimpleSidecarClient, 50
addTag
 SimpleSidecarClient, 52
appendHex
 qsense::UUID, 60
assign
 qsense::AutoPtr, 20
authenticate
 qsense::net::SidecarClient, 47
 SimpleSidecarClient, 52
AutoPtr
 qsense::AutoPtr, 19, 20
beginHeaders
 qsense::net::HttpRequest, 37
beginKeyTags
 qsense::Event, 30
beginReadings
 qsense::Event, 30
beginTags
 qsense::Event, 31
buffer
 qsense::hash::Sha1::Context, 26
Byte
 qsense, 14
 qsense::hash::MD5, 40
ByteOrder.h
 IMPLEMENT_BYTEORDER_BIG, 65
 IMPLEMENT_BYTEORDER_FLIP, 65
 IMPLEMENT_BYTEORDER_FLIP_, 65
 IMPLEMENT_BYTEORDER_LIT, 66
 IMPLEMENT_BYTEORDER_NOOP, 66
 IMPLEMENT_BYTEORDER_NOOP_, 66
cast
 qsense::AutoPtr, 20
compare
 qsense::UUID, 60
compute

- qsense::hash::MD5, 40
- connect
 - qsense::net::HttpClient, 34
- connected
 - qsense::net::HttpClient, 34
- copyFrom
 - qsense::UUID, 60
- copyTo
 - qsense::UUID, 60
- create
 - qsense::UUID, 60
 - qsense::net::HttpClient, 34
 - qsense::net::SidecarClient::UserResponse, 56
- createOrRetrieveAccessKeys
 - qsense::net::SidecarClient, 47
 - SimpleSidecarClient, 52
- createUser
 - qsense::net::SidecarClient, 48
 - SimpleSidecarClient, 52
- currentTime
 - qsense::net::DateTime, 27
 - SimpleSidecarClient, 53
- currentTimeMillis
 - qsense::net::DateTime, 27
 - SimpleSidecarClient, 53
- date
 - qsense::net::DateTime, 27
 - SimpleSidecarClient, 53
- DateTime
 - qsense::net::DateTime, 27
- decode
 - qsense::hash::base64, 15
- decodeLength
 - qsense::hash::base64, 15
- deleteUser
 - qsense::net::SidecarClient, 48
 - SimpleSidecarClient, 53
- dns
 - qsense::UUID, 60
- duplicate
 - qsense::AutoPtr, 20
 - qsense::RefCountedObject, 44
- encode
 - qsense::hash::base64, 15
- encodeLength
 - qsense::hash::base64, 15
- endHeaders
 - qsense::net::HttpRequest, 37
- endKeyTags
 - qsense::Event, 31
- endReadings
 - qsense::Event, 31
- endTags
 - qsense::Event, 31
- Ethernet
 - qsense::net, 16
 - SimpleSidecarClient, 50
- Event
 - qsense::Event, 30
- flipBytes
 - qsense::ByteOrder, 24
- fromBigEndian
 - qsense::ByteOrder, 24, 25
- fromLittleEndian
 - qsense::ByteOrder, 25
- fromNetwork
 - qsense::ByteOrder, 25
 - qsense::UUID, 60
- get
 - qsense::AutoPtr, 21
 - qsense::net::HttpClient, 34
- getBody
 - qsense::net::HttpRequest, 37
- getKey
 - qsense::Reading, 43
- getLatitude
 - qsense::Location, 39
- getLocation
 - qsense::Event, 31
- getLongitude
 - qsense::Location, 39
- getParamters
 - qsense::net::HttpRequest, 37
- getTimestamp
 - qsense::Reading, 43
- getUri
 - qsense::net::HttpRequest, 38
- getValue
 - qsense::Reading, 43
- hash
 - qsense::hash::Sha1, 45, 46
- hmac
 - qsense::hash::Sha1, 46
- HttpClient
 - qsense::net::HttpClient, 34
- HttpRequest
 - qsense::net::HttpRequest, 37
- IMPLEMENT_BYTEORDER_BIG
 - ByteOrder.h, 65
- IMPLEMENT_BYTEORDER_FLIP
 - ByteOrder.h, 65
- IMPLEMENT_BYTEORDER_FLIP_
 - ByteOrder.h, 65
- IMPLEMENT_BYTEORDER_LIT
 - ByteOrder.h, 66
- IMPLEMENT_BYTEORDER_NOOP
 - ByteOrder.h, 66
- IMPLEMENT_BYTEORDER_NOOP_
 - ByteOrder.h, 66
- init
 - qsense::Event, 31
 - qsense::UUID, 60

- initAPIKey
 - qsense::net::SidecarClient, 48
 - SimpleSidecarClient, 53
- initEventAPI
 - SimpleSidecarClient, 53
- initNetworkType
 - qsense::net, 16
 - SimpleSidecarClient, 54
- initUUID
 - SimpleSidecarClient, 54
- initUserKey
 - qsense::net::SidecarClient, 48
 - SimpleSidecarClient, 54
- ipad
 - qsense::hash::Sha1::Context, 26
- isNull
 - qsense::AutoPtr, 21
 - qsense::UUID, 60
- Iterator
 - qsense::net::HttpRequest, 37
- keyId
 - qsense::net::SidecarClient::UserResponse, 56
 - SimpleSidecarClient::UserResponse, 57
- KeyTags
 - qsense::Event, 29
- KeyTagsIterator
 - qsense::Event, 29
- Location
 - qsense::Location, 39
- MD5
 - qsense::hash::MD5, 40
- MD5.h
 - MD5_HASH_LENGTH, 69
- MD5_HASH_LENGTH
 - MD5.h, 69
- Map
 - qsense::net::HttpRequest, 37
- millis
 - qsense::net, 16
- NetworkType
 - qsense::net, 16
 - SimpleSidecarClient, 50
- nibble
 - qsense::UUID, 60
- null
 - qsense::UUID, 60
- numberOfKeyTags
 - qsense::Event, 31
- numberOfReadings
 - qsense::Event, 31
- numberOfTags
 - qsense::Event, 31
- oid
 - qsense::UUID, 61
- opad
 - qsense::hash::Sha1::Context, 26
- operator C *
 - qsense::AutoPtr, 21
- operator const C *
 - qsense::AutoPtr, 21
- operator!
 - qsense::AutoPtr, 21
- operator!=
 - qsense::AutoPtr, 21
 - qsense::UUID, 61
- operator<
 - qsense::AutoPtr, 22
 - qsense::UUID, 61
- operator<<
 - qsense, 14
- operator<=
 - qsense::AutoPtr, 22
 - qsense::UUID, 61
- operator>
 - qsense::AutoPtr, 23
 - qsense::UUID, 61
- operator>=
 - qsense::AutoPtr, 23
 - qsense::UUID, 61
- operator*
 - qsense::AutoPtr, 21
- operator+=
 - qsense::Event, 31
- operator->
 - qsense::AutoPtr, 21, 22
- operator=
 - qsense::AutoPtr, 22
 - qsense::Location, 39
 - qsense::UUID, 61
- operator==
 - qsense::AutoPtr, 22
 - qsense::UUID, 61
- operator[]
 - qsense::Event, 32
- parse
 - qsense::UUID, 61
- post
 - qsense::net::HttpClient, 35
- Ptr
 - qsense::net::HttpClient, 34
- publish
 - qsense::net::SidecarClient, 48
 - SimpleSidecarClient, 54
- QString
 - qsense, 14
- qsense, 13
 - Byte, 14
 - operator<<, 14
 - QString, 14
 - swap, 14
- qsense::AutoPtr

- ~AutoPtr, 20
- assign, 20
- AutoPtr, 19, 20
- cast, 20
- duplicate, 20
- get, 21
- isNull, 21
- operator C *, 21
- operator const C *, 21
- operator!, 21
- operator!=, 21
- operator<, 22
- operator<=, 22
- operator>, 23
- operator>=, 23
- operator*, 21
- operator->, 21, 22
- operator=, 22
- operator==, 22
- swap, 23
- unsafeCast, 23
- qsense::AutoPtr< C >, 17
- qsense::ByteOrder, 23
 - flipBytes, 24
 - fromBigEndian, 24, 25
 - fromLittleEndian, 25
 - fromNetwork, 25
 - toBigEndian, 25
 - toLittleEndian, 25
 - toNetwork, 25, 26
- qsense::Event, 28
 - ~Event, 30
 - add, 30
 - beginKeyTags, 30
 - beginReadings, 30
 - beginTags, 31
 - endKeyTags, 31
 - endReadings, 31
 - endTags, 31
 - Event, 30
 - getLocation, 31
 - init, 31
 - KeyTags, 29
 - KeyTagsIterator, 29
 - numberOfKeyTags, 31
 - numberOfReadings, 31
 - numberOfTags, 31
 - operator+=, 31
 - operator[], 32
 - Readings, 29
 - ReadingsIterator, 30
 - Tags, 30
 - TagsIterator, 30
 - toString, 32
- qsense::Location, 38
 - ~Location, 39
 - getLatitude, 39
 - getLongitude, 39
 - Location, 39
 - operator=, 39
 - toString, 39
- qsense::Reading, 41
 - ~Reading, 43
 - getKey, 43
 - getTimestamp, 43
 - getValue, 43
 - Reading, 41
 - toString, 43
- qsense::RefCountedObject, 43
 - ~RefCountedObject, 44
 - duplicate, 44
 - RefCountedObject, 44
 - referenceCount, 44
 - release, 44
- qsense::UUID, 57
 - ~UUID, 59
 - appendHex, 60
 - compare, 60
 - copyFrom, 60
 - copyTo, 60
 - create, 60
 - dns, 60
 - fromNetwork, 60
 - init, 60
 - isNull, 60
 - nibble, 60
 - null, 60
 - oid, 61
 - operator!=, 61
 - operator<, 61
 - operator<=, 61
 - operator>, 61
 - operator>=, 61
 - operator=, 61
 - operator==, 61
 - parse, 61
 - randomNumber, 61
 - toNetwork, 61
 - toString, 61
 - UUID, 59
 - UUID_DCE_UID, 59
 - UUID_NAME_BASED, 59
 - UUID_RANDOM, 59
 - UUID_TIME_BASED, 59
 - uri, 61
 - variant, 61
 - Version, 59
 - version, 62
 - x500, 62
- qsense::hash, 14
- qsense::hash::MD5, 40
 - ~MD5, 40
 - Byte, 40
 - compute, 40
 - MD5, 40
 - Word, 40

- qsense::hash::Sha1, 45
 - ~Sha1, 45
 - hash, 45, 46
 - hmac, 46
 - Sha1, 45
 - sign, 46
- qsense::hash::Sha1::Context, 26
 - buffer, 26
 - ipad, 26
 - opad, 26
 - state, 26
 - total, 26
- qsense::hash::base64, 15
 - decode, 15
 - decodeLength, 15
 - encode, 15
 - encodeLength, 15
- qsense::net, 15
 - Ethernet, 16
 - initNetworkType, 16
 - millis, 16
 - NetworkType, 16
 - WiFi, 16
- qsense::net::DateTime, 27
 - currentTime, 27
 - currentTimeMillis, 27
 - date, 27
 - DateTime, 27
 - singleton, 28
- qsense::net::HttpClient, 32
 - ~HttpClient, 34
 - connect, 34
 - connected, 34
 - create, 34
 - get, 34
 - HttpClient, 34
 - post, 35
 - Ptr, 34
 - readBody, 35
 - readHeaders, 35
 - readLine, 35
 - remove, 35
 - writeHeaders, 36
- qsense::net::HttpRequest, 36
 - ~HttpRequest, 37
 - beginHeaders, 37
 - endHeaders, 37
 - getBody, 37
 - getParamters, 37
 - getUri, 38
 - HttpRequest, 37
 - Iterator, 37
 - Map, 37
 - setBody, 38
 - setHeader, 38
 - setParameter, 38
- qsense::net::SidecarClient, 46
 - authenticate, 47
 - createOrRetrieveAccessKeys, 47
 - createUser, 48
 - deleteUser, 48
 - initAPIKey, 48
 - initUserKey, 48
 - publish, 48
- qsense::net::SidecarClient::UserResponse, 54
 - create, 56
 - keyId, 56
 - responseCode, 56
 - secret, 56
 - UserResponse, 55
- randomNumber
 - qsense::UUID, 61
- readBody
 - qsense::net::HttpClient, 35
- readHeaders
 - qsense::net::HttpClient, 35
- readLine
 - qsense::net::HttpClient, 35
- Reading
 - qsense::Reading, 41
- Readings
 - qsense::Event, 29
- ReadingsIterator
 - qsense::Event, 30
- RefCountedObject
 - qsense::RefCountedObject, 44
- referenceCount
 - qsense::RefCountedObject, 44
- release
 - qsense::RefCountedObject, 44
- remove
 - qsense::net::HttpClient, 35
- responseCode
 - qsense::net::SidecarClient::UserResponse, 56
 - SimpleSidecarClient::UserResponse, 57
- secret
 - qsense::net::SidecarClient::UserResponse, 56
 - SimpleSidecarClient::UserResponse, 57
- setBody
 - qsense::net::HttpRequest, 38
- setHeader
 - qsense::net::HttpRequest, 38
- setParameter
 - qsense::net::HttpRequest, 38
- Sha1
 - qsense::hash::Sha1, 45
- sign
 - qsense::hash::Sha1, 46
- SimpleSidecarClient, 49
 - addKeyTag, 50
 - addReading, 50
 - addTag, 52
 - authenticate, 52
 - createOrRetrieveAccessKeys, 52
 - createUser, 52

- currentTime, 53
- currentTimeMillis, 53
- date, 53
- deleteUser, 53
- Ethernet, 50
- initAPIKey, 53
- initEventAPI, 53
- initNetworkType, 54
- initUUID, 54
- initUserKey, 54
- NetworkType, 50
- publish, 54
- SimpleSidecarClient, 50
- WiFi, 50
- SimpleSidecarClient::UserResponse, 56
 - keyId, 57
 - responseCode, 57
 - secret, 57
 - UserResponse, 56
- singleton
 - qsense::net::DateTime, 28
- state
 - qsense::hash::Sha1::Context, 26
- swap
 - qsense, 14
 - qsense::AutoPtr, 23
- Tags
 - qsense::Event, 30
- TagsIterator
 - qsense::Event, 30
- toBigEndian
 - qsense::ByteOrder, 25
- toLittleEndian
 - qsense::ByteOrder, 25
- toNetwork
 - qsense::ByteOrder, 25, 26
 - qsense::UUID, 61
- toString
 - qsense::Event, 32
 - qsense::Location, 39
 - qsense::Reading, 43
 - qsense::UUID, 61
- total
 - qsense::hash::Sha1::Context, 26
- UUID
 - qsense::UUID, 59
- UUID_DCE_UID
 - qsense::UUID, 59
- UUID_NAME_BASED
 - qsense::UUID, 59
- UUID_RANDOM
 - qsense::UUID, 59
- UUID_TIME_BASED
 - qsense::UUID, 59
- unsafeCast
 - qsense::AutoPtr, 23
- uri
 - qsense::UUID, 61
- UserResponse
 - qsense::net::SidecarClient::UserResponse, 55
 - SimpleSidecarClient::UserResponse, 56
- variant
 - qsense::UUID, 61
- Version
 - qsense::UUID, 59
- version
 - qsense::UUID, 62
- WiFi
 - qsense::net, 16
 - SimpleSidecarClient, 50
- Word
 - qsense::hash::MD5, 40
- writeHeaders
 - qsense::net::HttpClient, 36
- x500
 - qsense::UUID, 62