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# PSU DERMS Operating Manual and EGoT System Reference (DOE-PSU-0000922-7)

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# **PSU DERMS Operating Manual and EGoT System Reference**

## **Development of an Energy Services Interface for the EGoT**

**WORK PERFORMED UNDER AGREEMENT**  
DE-OE0000922

Portland State University  
1900 SW 4<sup>th</sup> Ave  
Portland, OR 97201

**Period of Performance:** 7/13/2020 to 9/30/2023

**Submitted:** January 4, 2024  
**Revision:** 1.0

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**SUBMITTED TO**  
U. S. Department of Energy  
National Energy Technology Laboratory  
DOE Project Officer: Mario Sciulli

**This report does not contain any proprietary, business sensitive, or other information not subject to public release.**

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# PSU DERMS Operating Manual

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## ACRONYMS

CA	certificate authority
DCM	Distributed Control Module
DER	distributed energy resource
DERMS	Distributed Energy Resource Management System
ECS	entity component system
EGoT	Energy Grid of Things
ESI	Energy Service Interface
GO	Grid Operator
PSU	Portland State University

## 1 INTRODUCTION

This document guides the user of the Portland State University (PSU) Distributed Energy Resource Management System (DERMS) in configuration and normal operation. For direct access to the underlying code and its usage see the accompanying **PSU EGoT System Reference**. The system reference outlines all classes and methods used through the Energy Grid of Things (EGoT) system including applications, models, interfaces and the entity component system (ECS).

## 2 CONFIGURATION

The DERMS is a server and requires very little intervention once the system is running and configured. The DERMS requires a server to interact with as the Grid Operator (GO). Listing 1 outlines the connection information required by the DERMS. This config must be modified before the system is built to load it into the build repository. The GO dictates which services are available to interact with, the topology structure of the registered distributed energy resource (DER), and the time to synchronize with for grid service participation. These will be discussed in the following sections. In addition to a designated GO, the DERMS requires certificates that it has issued to communicate with it.

```
<config>
  <go>
    <address>"https://utility.ddns/"</address>
    <port>443</port>
    <root>"/"</root>
  </go>
</config>
```

Listing 1: topology configuration for registered clients within the Grid Operations service territory

## 2.1 Certification

The DERMS acts as the certificate authority (CA) for the EGoT system. Certificates must be issued for each client participating in grid services. The EGoT system provides a certificate generation script to generate new certificates for additional clients. The tool is located in the *ssl* directory and issues certificates for one year as this is only for testing purposes. Please follow the *README* file provided within the directory to set up your system to generate certificates as a certificate authority. During compilation, these certificates are copied into the build folder to ensure pathing for server/client initialization is correct.

## 2.2 Topology

The topology is simply a tree data structure that identifies parents and children within the system. Listing 2 demonstrates a simple nested grouping from the main group down to the service point at which a DER is installed. It is important to ensure each element only has a single parent within the topology. This ensures no elements appear to have direct control of a single DER.

```
<Groups href="/groups" >
  <Group name ="group-1">
    <Feeder name ="OL630-632">
      <Segment name ="UL632-633">
        <Transformer name ="xfmr_633_a_1">
          <ServicePoint name="tlx_633_a_h_1" />
          <ServicePoint name="tlx_633_c_h_40" />
        </Transformer>
      </Segment>
    </Feeder>
  </Group>
</Groups>
```

Listing 2: topology configuration for registered clients within the Grid Operations service territory

## 2.3 Grid Services

The DERMS periodically polls the GO for available grid services shown in Listing 4. The DERMS will determine which services its registered Distributed Control Module (DCM) can participate in and commit to the highest value services until all available and forecasted resources are committed to a service.

```

<services href="/services" >
  <service type="schedule" mRID="1A2B3C4D">
    <group>0</group>
    <interval_duration>3600</interval_duration>
    <interval_start>0</interval_start>
    <power>-360000</power>
    <price>0</price>
    <ramp>1200</ramp>
    <start_time>0</start_time>
  </service>
  <service type="emergency" mRID="1A2B3C">
    <group>1</group>
    <interval_duration>3600</interval_duration>
    <interval_start>0</interval_start>
    <power>360000</power>
    <price>0</price>
    <ramp>100</ramp>
    <start_time>0</start_time>
  </service>
</services>

```

Listing 3: Available grid services for participation

## 2.4 Synchronization

To accurately participate in grid services the DERMS requires a time source that aligns with the GO. The DERMS will query its GO for a *Time* resource to synchronize periodically. The *Time* resource uses the same model outlined by IEEE 2030.5-2018.

## 2.5 Grid Services

```

<Time pollRate="900" href="/time">
  <currentTime>1691072429</currentTime>
  <dstEndTime>1699149600</dstEndTime>
  <dstOffset>3600</dstOffset>
  <dstStartTime>1678586400</dstStartTime>
  <localTime>1691047229</localTime>
  <quality>7</quality>
  <tzOffset>-28800</tzOffset>
</Time>

```

Listing 4: Time configuration following IEEE 2030.5-2018

## 3 GRID SERVICE LIFECYCLE

There are two primary means to participate in grid services within the DERMS. The primary method is highlighted in Figure 1. The *FlowReservationRequest* package provides the ideal mechanism for satisfying Energy Service Interface (ESI) principles. Registered DER periodically post *FlowReservationRequest* to the DERMS to be used for a grid service. The DERMS then generates a *FlowReservationResponse* for the DER to participate in a grid service that will be updated as the service parameters change. During active participation, the DER posts its *PowerStatus* to inform the DERMS that it is still participating, which will also be used for verification in the final lifecycle.

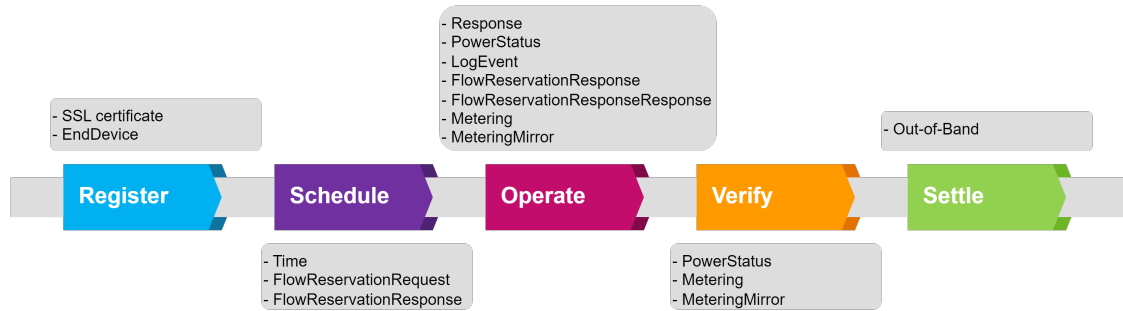


Fig. 1: Data capture for grid service lifecycles using IEEE 2030.5-2018 FlowReservationRequests package.

However, not all services are possible with the *FlowReservationRequest* package. For curve-based services, such as frequency-watt and volt-var the DERMS uses the *DER* package. Figure 2 demonstrates the updated information required for each of the grid service lifecycles. When a DER supports active curve control, the DERMS will generate a specified *DERCurve* for the DER to participate in frequency response and voltage regulating services autonomously. The DER will create a *MeteringMirror* capture active participation and update the DERMS at a designated period depending on the participation period of the selected grid server.

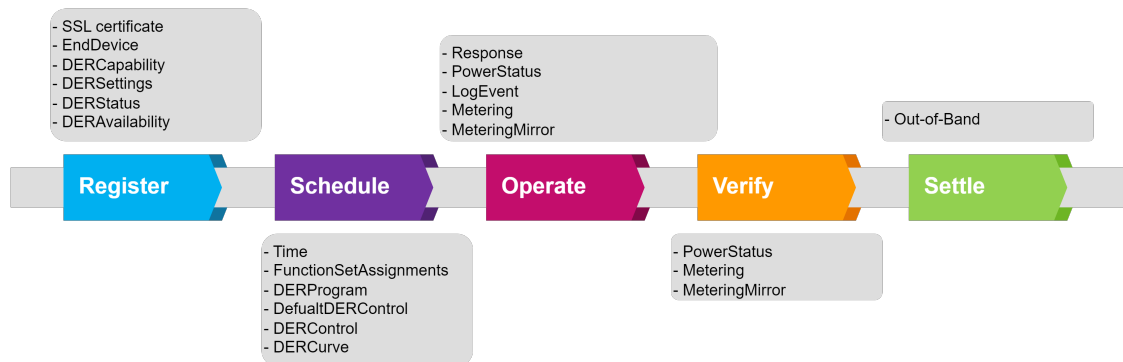


Fig. 2: Data capture for grid service lifecycles using IEEE 2030.5-2018 DER package.

The settlement of grid services was deemed outside the scope, but the process should use the verification cycle to determine participation and calculate the required compensation based on the selected service for participation.



# PSU EGoT System Reference

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# Chapter 1

## doe-egot-dcm

[Energy](#) Grid of Things: Distributed Control Module





## Chapter 2

# README



## Chapter 3

# Distributed Trust Module Client

Currently there is no need for the setup section as all modules used are base python.

### 3.1 Setup

```
python3 -m venv .venv
source .venv/bin/activate
pip install --upgrade pip
pip install -r req*.txt
```

### 3.2 Running

```
python3 build/bin/dtmc.py
```



# Chapter 4

## doe-egot-gsp

[Energy](#) Grid of Things: Grid [Service](#) Provider

### 4.1 Certificates and Registration

To expedite the testing phase we will use self-signed certificates generated with openssl.



## Chapter 5

# Distributed Trust Module Client

Currently there is no need for the setup section as all modules used are base python.

### 5.1 Setup

```
python3 -m venv .venv
source .venv/bin/activate
pip install --upgrade pip
pip install -r req*.txt
```

### 5.2 Running

```
python3 build/bin/dtmc.py
```





# Chapter 6

## CTA 2045

This is an implementation of CTA 2045 functions for Portland State University's [Energy](#) Grid of Things (EGoT).

### 6.1 References

The reference information can be found at the following links:

CTA 2045 Standard: <https://shop.cta.tech/products/modular-communications-interface-for-ener>

EPRI C++ [UCM](#) Library: <https://github.com/epri-dev/CTA-2045-UCM-CPP-Library.git>



## Chapter 7

# HTTPS

The client and server use Boost Beast.



## Chapter 8

# IEEE 2030.5 (SEP 2.0)

This is an implementation of IEEE 2030.5 models, adapters, and command patterns for Portland State Universities [Energy Grid of Things \(EGoT\)](#)

### 8.1 Reference

The reference information can be found at the following link.

[https://standards.ieee.org/content/dam/ieee-standards/standards/web/download/2030.5-2018\\_downloads.zip](https://standards.ieee.org/content/dam/ieee-standards/standards/web/download/2030.5-2018_downloads.zip)



# Chapter 9

## Utilities

A place for random functions that may be helpful for all other builds.

### 9.1 Functions

- `getTime()`
- `readFile()`
- `getProgramPath()`





# Chapter 10

## doe-egot-system

Department of [Energy](#) - [Energy](#) Grid of Things System

### 10.1 Development

- <https://tmuxcheatsheet.com/>

#### 10.1.1 Linux OS

```
cd doe-egot-system
./tools/setup.sh
```

### 10.2 Building

For development the build type should be set to *Debug*, but all performance testing should use *Release*. There may be issues when trying to compile multiple build types so the build folder should have a different name.

```
cd doe-egot-system
cmake -S . -B build -DCMAKE_BUILD_TYPE=Debug -DCMAKE_EXPORT_COMPILE_COMMANDS=1
cmake --build build
```

#### 10.2.1 Documentation

If you would like to build the documentation install the following requirements and run doxygen.

```
sudo apt install doxygen graphviz
cd docs
doxygen
```

If you would like a PDF of the documentation run install the following requirements and run make within the latex folder.

```
sudo apt install texlive-base texlive-latex-recommended texlive-latex-extra
cd docs
doxygen
cd latex
make
```

## 10.3 Running

Running the system as a whole is done through the `run_egot.sh` script found in tools. It will spawn tree tmux sessions: GSP, DTMC, and DERS. The DERS session will have  $n$  number of DCMS running in individual windows within the session. See snapshot of terminal after running.

```
cd doe-egot-system
./tools/run_egot.sh <n>
tmux ls
tmux a -t <session>
```

## 10.4 Stop

Stopping the EGoT system only requires stopping all tmux sessions.

```
tmux kill-server
```

## 10.5 Project Organization

Compartmentalize all functions into their own folders. Build as static or dynamic libraries. Allows for easy unit testing  
Reduce duplication of work within the main GSP, DCM, and DTM

## 10.6 Primary Updates

- `ecs`
  - The entity component system modules for IEEE 2030.5 Common, Support, and Smart [Energy](#) resources has be created and primary components have be registered.
  - The next step will include the addition of specific systems for each resource as needed.
- `interfaces`
  - The https client and server have been implemented using the Singleton design pattern to make the GSP and DCM implementation easier.
  - The https server now uses the ECS as its backend for resource storage and processing. Currently only the [Device](#) Capability resource has been tested, but the remaining resources will be added as we progress through the Test Plan.
- `standards`
  - There have been a few updates to the models to bring them more inline with the IEEE standard representation. Most notably all Link and ListLink member variables have been changed.
  - The edits where updated with the xml adapter class and further tests will be written as the Test Plans are developed.
- `test plans`
  - Stubs have been made for each of the main EGoT components and a Unit Test will be written for each Product Requirement.
  - Currently supporting test outputs have been stored in text files. The XML tests and Https Test using the new ECS as a backend for the server are stored within this folder.

# Chapter 11

## SSL-CA

This will server as a portable certificate authority for https clients and servers. **DO NOT USE THESE IN PRODUCTION CODE**

### 11.1 Resources

- [Great Tutorial](#)
- [Certificate Authority](#)
- [OpenSSL Cookbook](#)

### 11.2 Setup

Create the ssl directory structure and seed db index and crlnumber.

```
./setup.sh
```

#### 11.2.1 certs

Certificate storage; new certificates will be placed here as they are issued.

#### 11.2.2 db

This directory is used for the certificate database (index) and the files that hold the next certificate and CRL serial numbers. OpenSSL will create some additional files as needed.

#### 11.2.3 private

This directory will store the private keys, one for the CA and the other for the OCSP responder. It's important that no other user has access to it.

*NOTE: When creating a new CA certificate, it's important to initialize the certificate serial numbers with a random number generator, as I do in this section.*

## 11.3 Root CA Generation

```
./ca_gen.sh
```

### 11.3.1 Root CA Operations

To revoke a certificate, use the `-revoke` switch of the `ca` command.

```
openssl ca \  
-config root-ca.conf \  
-revoke root-ca/certs/1002.pem \  
-crl_reason keyCompromise
```

### 11.3.2 Subordinate CA Operations

```
./server_gen.sh
```

## 11.4 Script

- **Example Setup** To expedite the CA, Server, and client generation run the bash script to generate the specified number of client certs:

```
cert_gen.sh 10
```

## 11.5 Test Client

```
cd certs  
openssl s_client -connect localhost:443 -state -debug -cert client1.crt -key client1.key
```

# Chapter 12

## Hierarchical Index

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

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# Chapter 13

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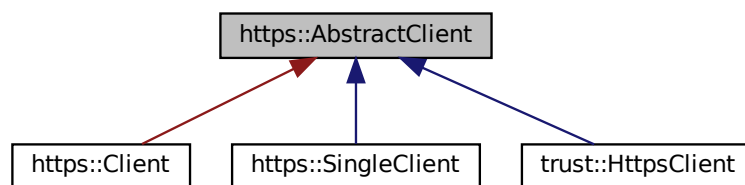
# Chapter 14

## Class Documentation

### 14.1 https::AbstractClient Class Reference

```
#include <abstract_client.hpp>
```

Inheritance diagram for https::AbstractClient:



#### Public Member Functions

- virtual sep::HexBinary160 **getLFDI** ()=0
- virtual boost::beast::http::response< boost::beast::http::dynamic\_body > **Get** (const std::string &target, const std::string &query="")=0
- virtual boost::beast::http::response< boost::beast::http::dynamic\_body > **Post** (const std::string &target, const std::string &resource)=0
- virtual boost::beast::http::response< boost::beast::http::dynamic\_body > **Put** (const std::string &target, const std::string &resource)=0
- virtual boost::beast::http::response< boost::beast::http::dynamic\_body > **Delete** (const std::string &target)=0

#### 14.1.1 Detailed Description

HTTP client interface

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

- /home/tylor/dev/does-egot-system/libs/https/client/include/https/client/abstract\_client.hpp

## 14.2 cea2045::AbstractDevice Class Reference

### Public Member Functions

- virtual [DeviceInfo](#) **getDeviceInfo** ()=0
- virtual commodity\_map **getCommodity** ()=0
- virtual cea2045::ResponseCodes **loadUp** (const uint8\_t duration=0)=0
- virtual cea2045::ResponseCodes **shed** (const uint8\_t duration=0)=0
- virtual cea2045::ResponseCodes **endShed** (const uint8\_t duration=0)=0
- virtual cea2045::ResponseCodes **criticalPeakEvent** (const uint8\_t duration=0)=0
- virtual cea2045::ResponseCodes **gridEmergency** (const uint8\_t duration=0)=0

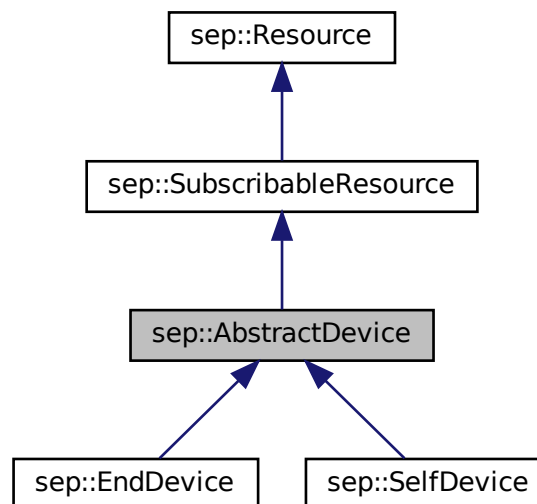
The documentation for this class was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/cea2045/include/cea2045/abstract\_device.hpp

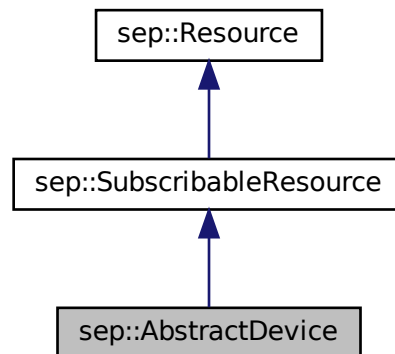
## 14.3 sep::AbstractDevice Struct Reference

```
#include <abstract_device.hpp>
```

Inheritance diagram for sep::AbstractDevice:



Collaboration diagram for sep::AbstractDevice:



## Public Attributes

- SFDIType **sfdi**
- boost::optional< [ConfigurationLink](#) > **configuration\_link**
- boost::optional< [DERListLink](#) > **der\_list\_link**
- boost::optional< DeviceCategoryType > **device\_category**
- boost::optional< [DeviceInformationLink](#) > **device\_information\_link**
- boost::optional< [DeviceStatusLink](#) > **device\_status\_link**
- boost::optional< [FileStatusLink](#) > **file\_status\_link**
- boost::optional< [IPInterfaceListLink](#) > **ip\_interface\_list\_link**
- boost::optional< HexBinary160 > **lfdi**
- boost::optional< [LoadShedAvailabilityListLink](#) > **load\_shed\_availability\_list\_link**
- boost::optional< [LogEventListLink](#) > **log\_event\_list\_link**
- boost::optional< [PowerStatusLink](#) > **power\_status\_link**

### 14.3.1 Detailed Description

The [EndDevice](#) providing the resources available within the DeviceCapabilities.

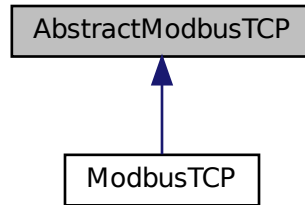
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/abstract\_device.hpp



## 14.4 AbstractModbusTCP Class Reference

Inheritance diagram for AbstractModbusTCP:



### Public Member Functions

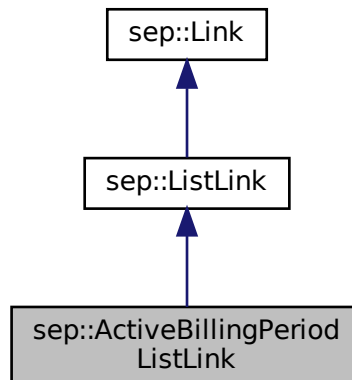
- virtual void **ReadRegisters** (const uint16\_t offset, const uint16\_t length, uint16\_t \*reg\_ptr)=0
- virtual void **WriteRegisters** (const uint16\_t offset, const uint16\_t length, const uint16\_t \*reg\_ptr)

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

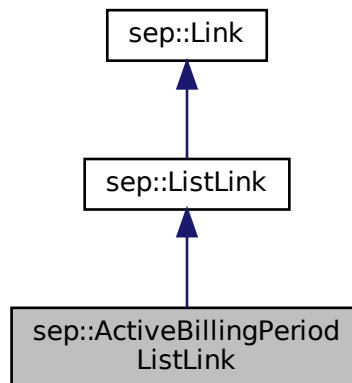
- /home/tylor/dev/dae-egot-system/libs/modbus/include/modbus/modbus\_tcp.hpp

## 14.5 sep::ActiveBillingPeriodListLink Struct Reference

Inheritance diagram for sep::ActiveBillingPeriodListLink:



Collaboration diagram for sep::ActiveBillingPeriodListLink:



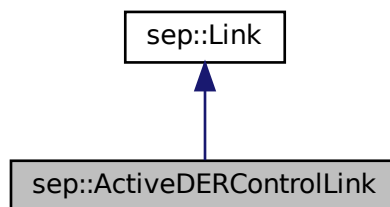
### Additional Inherited Members

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

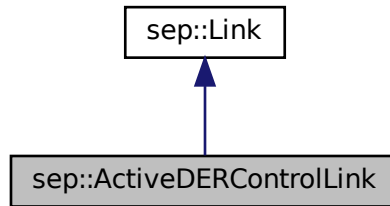
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_period.hpp

## 14.6 sep::ActiveDERControlLink Struct Reference

Inheritance diagram for sep::ActiveDERControlLink:



Collaboration diagram for sep::ActiveDERControlLink:



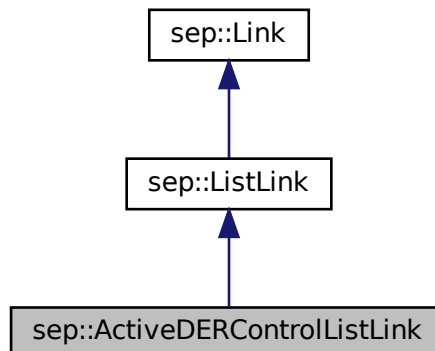
### Additional Inherited Members

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

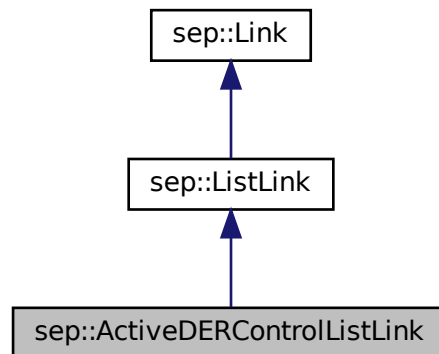
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

## 14.7 sep::ActiveDERControlListLink Struct Reference

Inheritance diagram for sep::ActiveDERControlListLink:



Collaboration diagram for sep::ActiveDERControlListLink:



### Additional Inherited Members

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

## 14.8 sep::ActivePower Struct Reference

```
#include <active_power.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- Int16 **value**

#### 14.8.1 Detailed Description

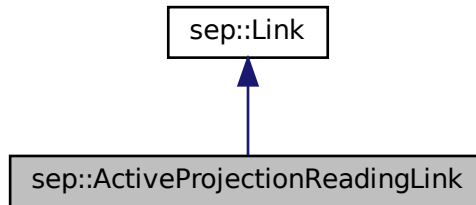
The active (real) power  $P$  (in W) is the product of root-mean-square (RMS) voltage, RMS current, and  $\cos(\theta)$  where  $\theta$  is the phase angle of current relative to voltage. It is the primary measure of the rate of flow of energy.

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

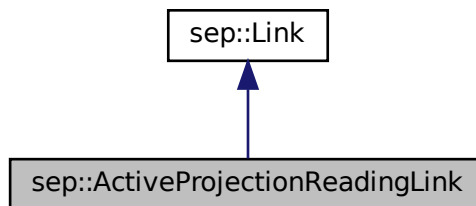
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/active\_power.hpp

## 14.9 sep::ActiveProjectionReadingLink Struct Reference

Inheritance diagram for sep::ActiveProjectionReadingLink:



Collaboration diagram for sep::ActiveProjectionReadingLink:



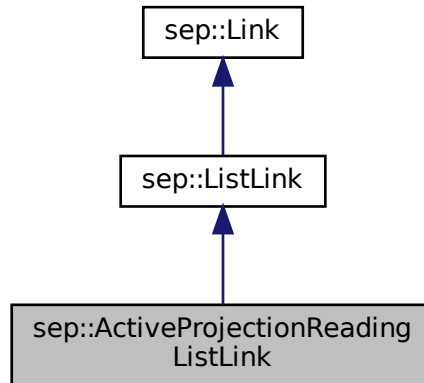
### Additional Inherited Members

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

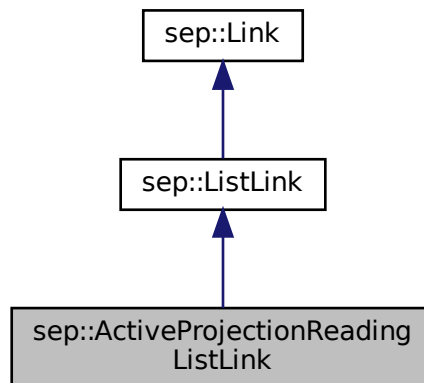
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.10 sep::ActiveProjectionReadingListLink Struct Reference

Inheritance diagram for sep::ActiveProjectionReadingListLink:



Collaboration diagram for sep::ActiveProjectionReadingListLink:



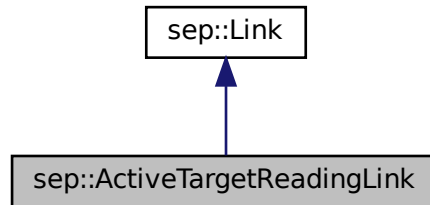
### Additional Inherited Members

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

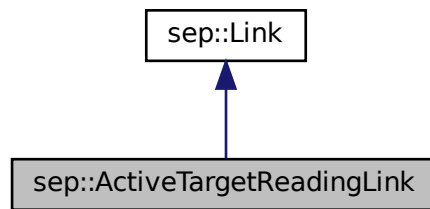
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.11 sep::ActiveTargetReadingLink Struct Reference

Inheritance diagram for sep::ActiveTargetReadingLink:



Collaboration diagram for sep::ActiveTargetReadingLink:



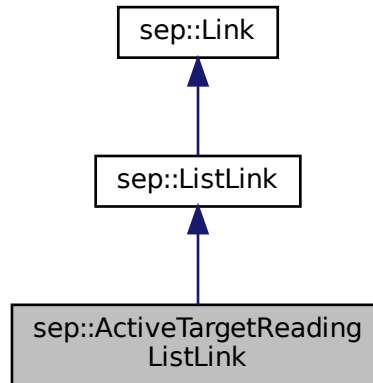
### Additional Inherited Members

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

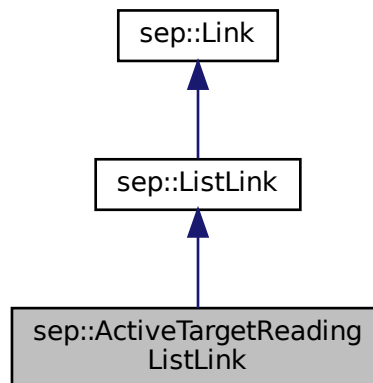
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.12 sep::ActiveTargetReadingListLink Struct Reference

Inheritance diagram for sep::ActiveTargetReadingListLink:



Collaboration diagram for sep::ActiveTargetReadingListLink:



### Additional Inherited Members

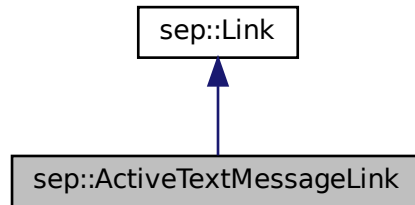
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing_meter_reading.hpp`

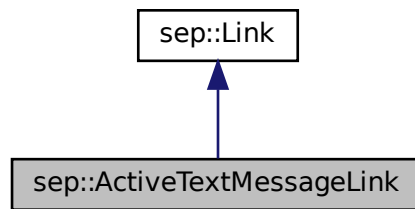


## 14.13 sep::ActiveTextMessageLink Struct Reference

Inheritance diagram for sep::ActiveTextMessageLink:



Collaboration diagram for sep::ActiveTextMessageLink:



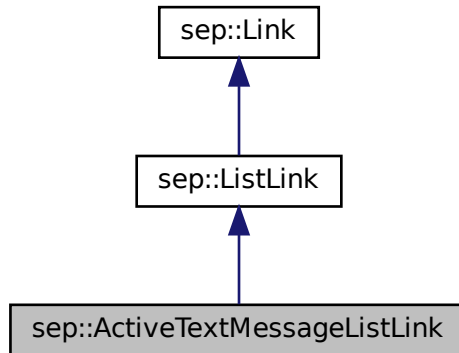
### Additional Inherited Members

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

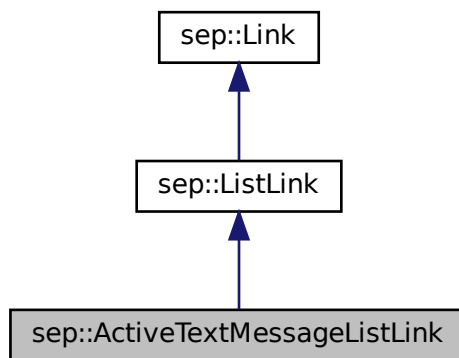
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/text\_message.hpp

## 14.14 sep::ActiveTextMessageListLink Struct Reference

Inheritance diagram for sep::ActiveTextMessageListLink:



Collaboration diagram for sep::ActiveTextMessageListLink:



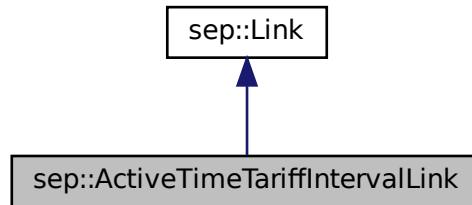
### Additional Inherited Members

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

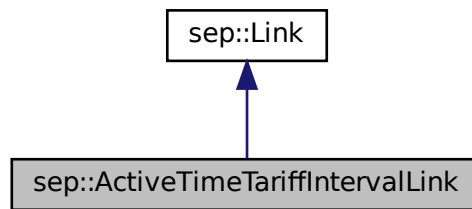
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/text\_message.hpp

## 14.15 sep::ActiveTimeTariffIntervalLink Struct Reference

Inheritance diagram for sep::ActiveTimeTariffIntervalLink:



Collaboration diagram for sep::ActiveTimeTariffIntervalLink:



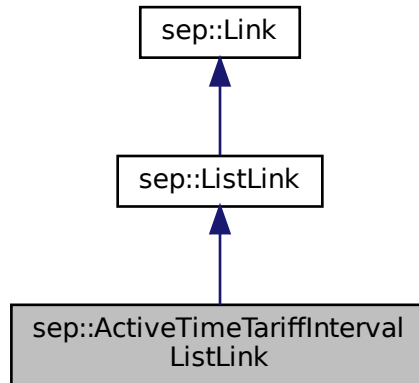
### Additional Inherited Members

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

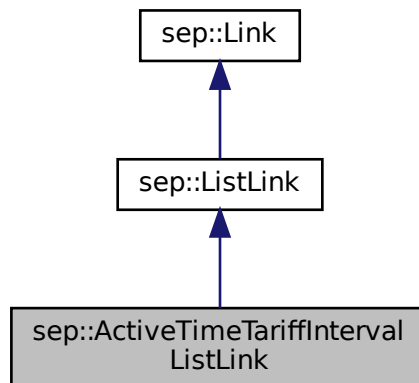
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/time\_tariff\_interval.hpp

## 14.16 sep::ActiveTimeTariffIntervalListLink Struct Reference

Inheritance diagram for sep::ActiveTimeTariffIntervalListLink:



Collaboration diagram for sep::ActiveTimeTariffIntervalListLink:



### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/time\_tariff\_interval.hpp

## 14.17 sep::AmpereHour Struct Reference

```
#include <ampere_hour.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UInt16 **value**

### 14.17.1 Detailed Description

[Available](#) electric charge

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/ampere\_hour.hpp

## 14.18 sep::ApparentPower Struct Reference

```
#include <apparent_power.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UInt16 **value**

### 14.18.1 Detailed Description

The apparent power  $S$  (in VA) is the product of root mean square (RMS) voltage and RMS current.

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/apparent\_power.hpp

## 14.19 ecs::server::rg::Area Struct Reference

### Public Attributes

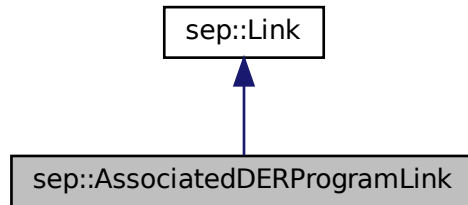
- std::string **id**

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

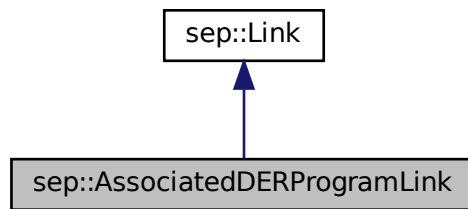
- /home/tylor/dev/dae-egot-system/libs/ecs/server/sep/include/ecs/server/sep/rg.hpp

## 14.20 sep::AssociatedDERProgramLink Struct Reference

Inheritance diagram for sep::AssociatedDERProgramLink:



Collaboration diagram for sep::AssociatedDERProgramLink:



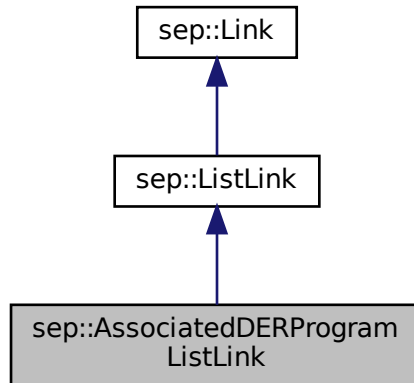
### Additional Inherited Members

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

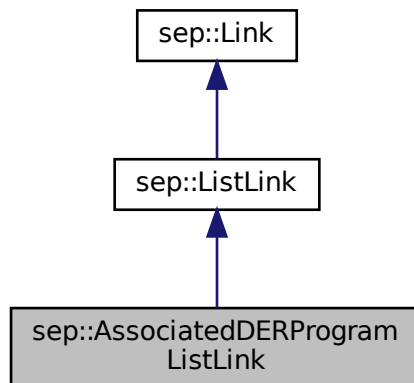
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

## 14.21 sep::AssociatedDERProgramListLink Struct Reference

Inheritance diagram for sep::AssociatedDERProgramListLink:



Collaboration diagram for sep::AssociatedDERProgramListLink:



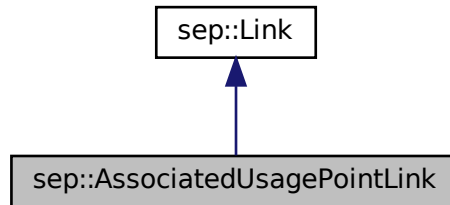
### Additional Inherited Members

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

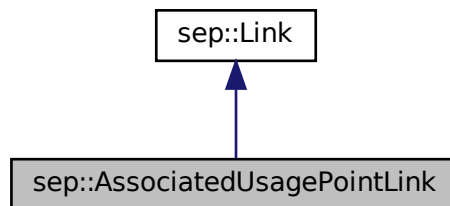
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

## 14.22 sep::AssociatedUsagePointLink Struct Reference

Inheritance diagram for sep::AssociatedUsagePointLink:



Collaboration diagram for sep::AssociatedUsagePointLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/usage\_point\_base.hpp

## 14.23 Available Struct Reference

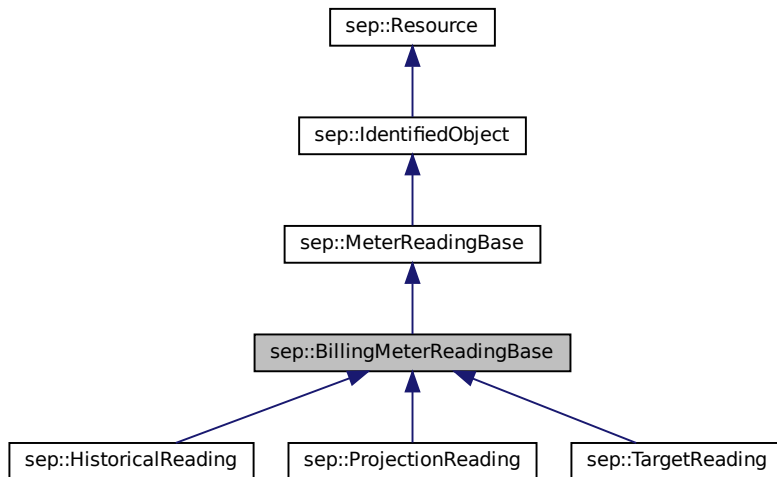
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/apps/simple/src/main.cpp

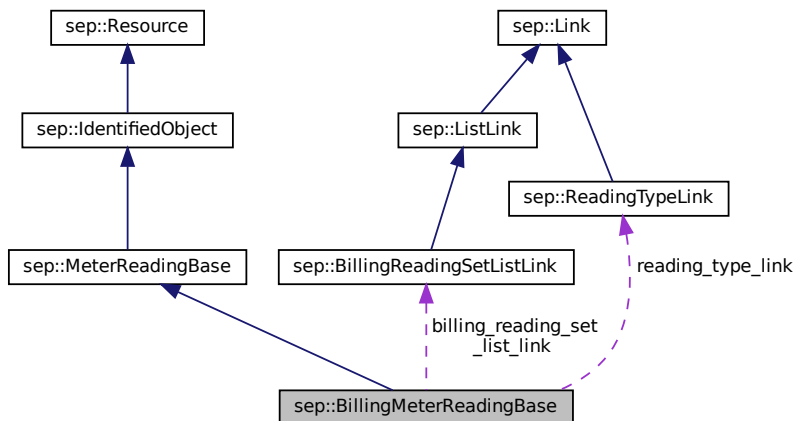


## 14.24 sep::BillingMeterReadingBase Struct Reference

Inheritance diagram for sep::BillingMeterReadingBase:



Collaboration diagram for sep::BillingMeterReadingBase:



### Public Attributes

- [BillingReadingSetListLink](#) `billing_reading_set_list_link`
- [ReadingTypeLink](#) `reading_type_link`

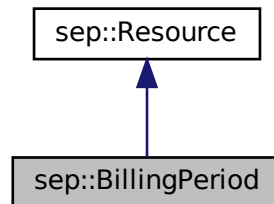
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing_meter_reading.hpp`

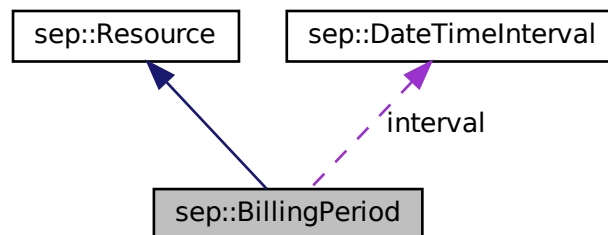
## 14.25 sep::BillingPeriod Struct Reference

```
#include <billing_period.hpp>
```

Inheritance diagram for sep::BillingPeriod:



Collaboration diagram for sep::BillingPeriod:



### Public Attributes

- Int48 **bill\_last\_period**
- Int48 **bill\_to\_date**
- [DateTimeInterval](#) **interval**
- TimeType **status\_timestamp**

### 14.25.1 Detailed Description

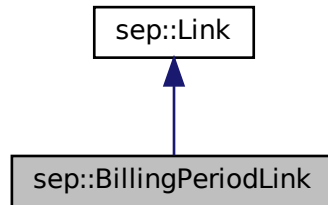
A Billing Period relates to the period of time on which a customer is billed. As an example the billing period interval for a particular customer might be 31 days starting on July 1, 2011. The start date and interval can change on each billing period. There may also be multiple billing periods related to a customer agreement to support different tariff structures.

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

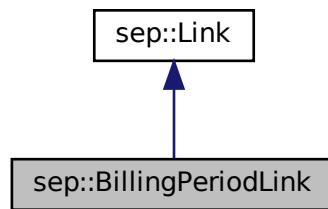
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_period.hpp

## 14.26 sep::BillingPeriodLink Struct Reference

Inheritance diagram for sep::BillingPeriodLink:



Collaboration diagram for sep::BillingPeriodLink:



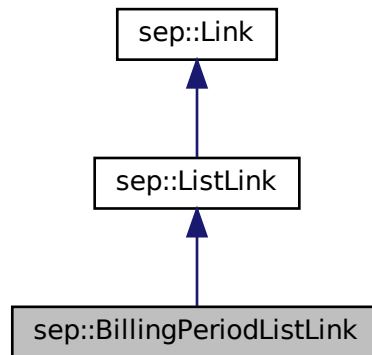
### Additional Inherited Members

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

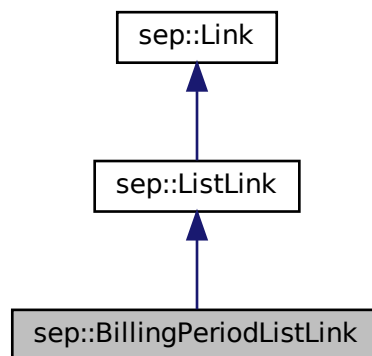
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_period.hpp

## 14.27 sep::BillingPeriodListLink Struct Reference

Inheritance diagram for sep::BillingPeriodListLink:



Collaboration diagram for sep::BillingPeriodListLink:



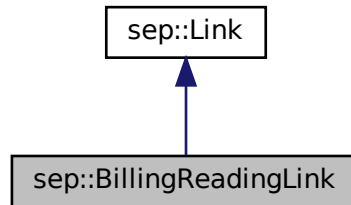
### Additional Inherited Members

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

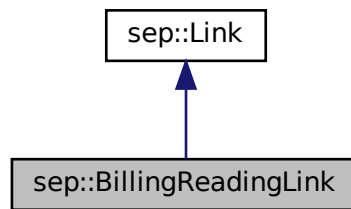
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_period.hpp

## 14.28 sep::BillingReadingLink Struct Reference

Inheritance diagram for sep::BillingReadingLink:



Collaboration diagram for sep::BillingReadingLink:



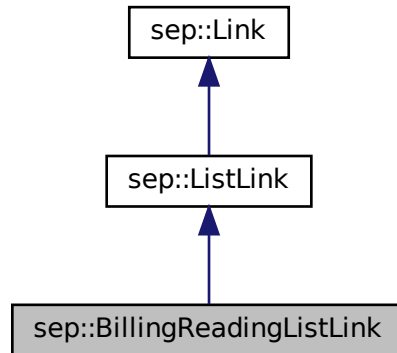
### Additional Inherited Members

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

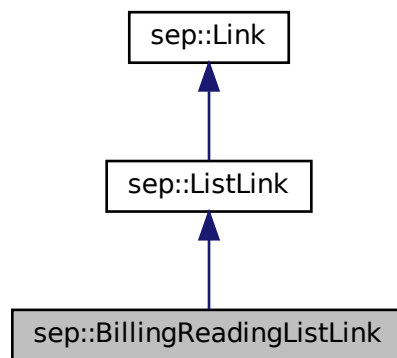
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_reading\_set.hpp

## 14.29 sep::BillingReadingListLink Struct Reference

Inheritance diagram for sep::BillingReadingListLink:



Collaboration diagram for sep::BillingReadingListLink:



### Additional Inherited Members

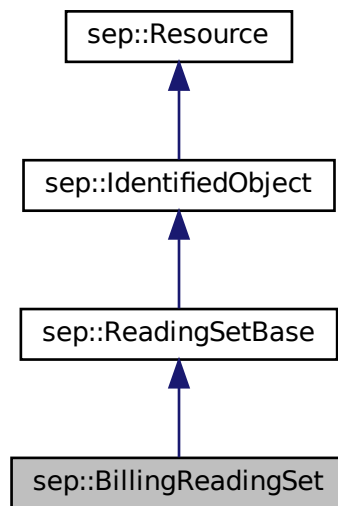
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_reading\_set.hpp

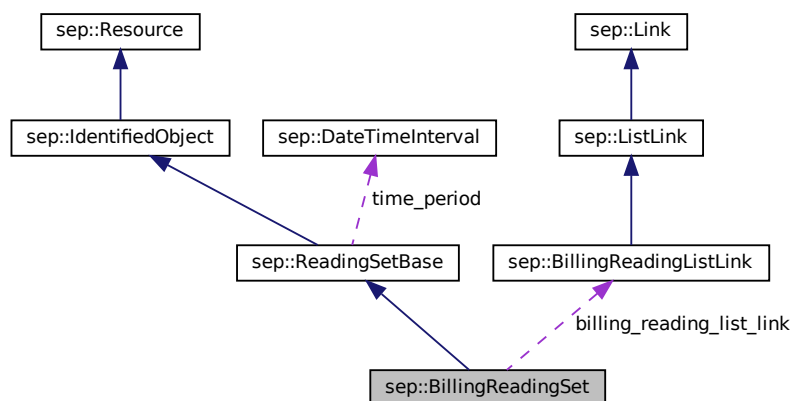
### 14.30 sep::BillingReadingSet Struct Reference

```
#include <billing_reading_set.hpp>
```

Inheritance diagram for sep::BillingReadingSet:



Collaboration diagram for sep::BillingReadingSet:



#### Public Attributes

- [BillingReadingListLink](#) `billing_reading_list_link`

### 14.30.1 Detailed Description

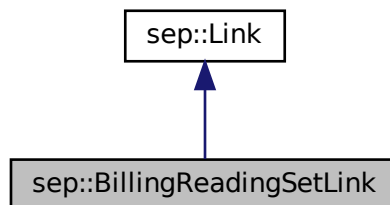
**Time** sequence of readings of the same reading type.

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

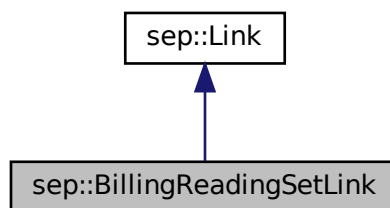
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/billing\_reading\_set.hpp

## 14.31 sep::BillingReadingSetLink Struct Reference

Inheritance diagram for sep::BillingReadingSetLink:



Collaboration diagram for sep::BillingReadingSetLink:



### Additional Inherited Members

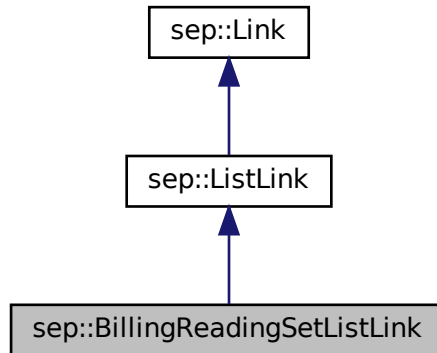
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/billing\_reading\_set.hpp

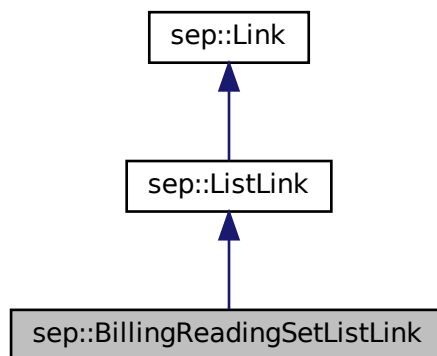


## 14.32 sep::BillingReadingSetListLink Struct Reference

Inheritance diagram for sep::BillingReadingSetListLink:



Collaboration diagram for sep::BillingReadingSetListLink:



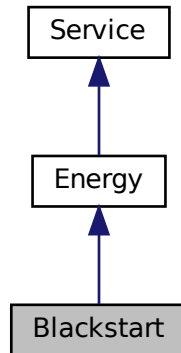
### Additional Inherited Members

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

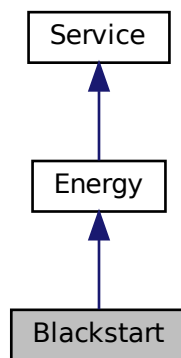
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_reading\_set.hpp

## 14.33 Blackstart Struct Reference

Inheritance diagram for Blackstart:



Collaboration diagram for Blackstart:



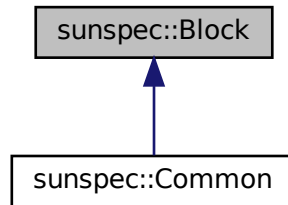
### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/apps/simple/src/main.cpp

## 14.34 sunspec::Block Struct Reference

Inheritance diagram for sunspec::Block:



### Public Attributes

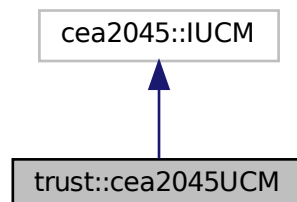
- uint8\_t **length**
- std::string **id**
- std::string **name**
- std::string **description**

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

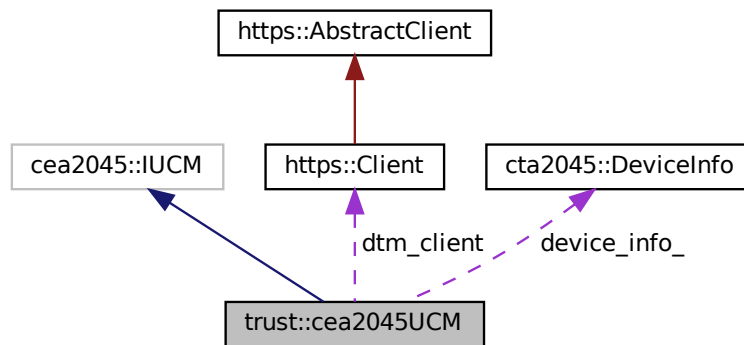
- /home/tylor/dev/dae-egot-system/libs/sunspec-modbus/include/sunspec/block.hpp

## 14.35 trust::cea2045UCM Class Reference

Inheritance diagram for trust::cea2045UCM:



Collaboration diagram for trust::cea2045UCM:



## Public Member Functions

- **cea2045UCM** (const [https::Context](#) &dtm)
- bool **isMessageTypeSupported** (cea2045::MessageTypeCode type\_code) override
- cea2045::MaxPayloadLengthCode **getMaxPayload** () override
- void **processMaxPayloadResponse** (cea2045::MaxPayloadLengthCode payload) override
- void **processDeviceInfoResponse** (cea2045::cea2045DeviceInfoResponse \*message) override
- void **processCommodityResponse** (cea2045::cea2045CommodityResponse \*message) override
- void **processSetEnergyPriceResponse** (cea2045::cea2045IntermediateResponse \*message) override
- void **processSetTemperatureOffsetResponse** (cea2045::cea2045IntermediateResponse \*message) override
- void **processGetTemperatureOffsetResponse** (cea2045::cea2045GetTemperateOffsetResponse \*message) override
- void **processSetSetpointsResponse** (cea2045::cea2045IntermediateResponse \*message) override
- void **processGetSetpointsResponse1** (cea2045::cea2045GetSetpointsResponse1 \*message) override
- void **processGetSetpointsResponse2** (cea2045::cea2045GetSetpointsResponse2 \*message) override
- void **processStartCyclingResponse** (cea2045::cea2045IntermediateResponse \*message) override
- void **processTerminateCyclingResponse** (cea2045::cea2045IntermediateResponse \*message) override
- void **processGetPresentTemperatureResponse** (cea2045::cea2045GetPresentTemperatureResponse \*message) override
- void **processGetUTCTimeResponse** (cea2045::cea2045GetUTCTimeResponse \*message) override
- void **processAckReceived** (cea2045::MessageCode code) override
- void **processNakReceived** (cea2045::LinkLayerNakCode nak, cea2045::MessageCode code) override
- void **processAppAckReceived** (cea2045::cea2045Basic \*message) override
- void **processAppNakReceived** (cea2045::cea2045Basic \*message) override
- void **processOperationalStateReceived** (cea2045::cea2045Basic \*message) override
- void **processAppCustomerOverride** (cea2045::cea2045Basic \*message) override
- void **processIncompleteMessage** (const unsigned char \*buffer, unsigned int byte\_count) override

## Public Attributes

- cea2045::MaxPayloadLengthCode **max\_payload\_**
- [cta2045::DeviceInfo](#) **device\_info\_**
- cta2045::commodity\_map **commodities\_**
- cea2045::cea2045GetTemperateOffsetResponse **temperature\_offset\_**
- cea2045::cea2045GetSetpointsResponse1 **setpoint\_1\_**
- cea2045::cea2045GetSetpointsResponse2 **setpoint\_2\_**
- cea2045::cea2045GetPresentTemperatureResponse **present\_temperature\_**
- cea2045::cea2045GetUTCTimeResponse **utc\_time\_**

## Protected Attributes

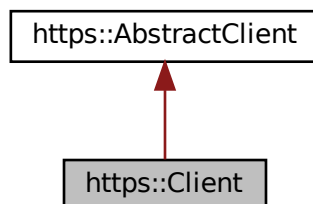
- [https::Client](#) **dtm\_client**

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

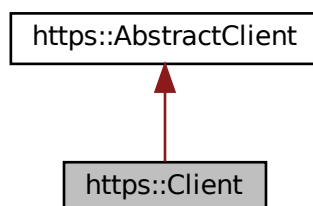
- /home/tylor/dev/doe-egot-system/libs/trust/cta2045/include/trust/cta2045/trust\_ucm.hpp
- /home/tylor/dev/doe-egot-system/libs/trust/cta2045/trust\_ucm.cpp

## 14.36 https::Client Class Reference

Inheritance diagram for https::Client:



Collaboration diagram for https::Client:



## Public Member Functions

- **Client** (const [Context](#) &context)
- sep::HexBinary160 **getLFDI** () override
- [Context](#) **getContext** ()
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Get** (const std::string &target, const std::string &query="") override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Post** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Put** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Delete** (const std::string &target) override

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

- /home/tylor/dev/does-egot-system/libs/https/client/include/https/client/client.hpp
- /home/tylor/dev/does-egot-system/libs/https/client/src/client.cpp

## 14.37 ecs::singleton::Clock Struct Reference

### Public Attributes

- int64\_t **utc**
- int64\_t **local**
- int64\_t **offset**

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

- /home/tylor/dev/does-egot-system/libs/ecs/singleton/include/ecs/singleton/clock.hpp

## 14.38 cta2045::CommodityData Struct Reference

### Public Attributes

- int64\_t **instantaneous**
- int64\_t **cumulative**

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

- /home/tylor/dev/does-egot-system/libs/trust/cta2045/include/trust/cta2045/trust\_ucm.hpp

## 14.39 CommodityMessage Struct Reference

### Public Attributes

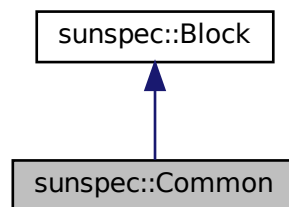
- int **commodityCode**
- int **cumulativeAmount**
- int **instantRate**

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

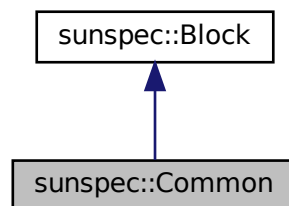
- /home/tylor/dev/doe-egot-system/libs/cta2045/include/cta2045/cta2045\_handler.hpp

## 14.40 sunspec::Common Class Reference

Inheritance diagram for sunspec::Common:



Collaboration diagram for sunspec::Common:



### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sunspec-modbus/include/sunspec/common.hpp
- /home/tylor/dev/doe-egot-system/libs/sunspec-modbus/common.cpp

## 14.41 sep::Condition Struct Reference

```
#include <subscription.hpp>
```

### Public Attributes

- UInt8 **attribute\_identifier**
- Int48 **lower\_threshold**
- Int48 **upper\_threshold**

### 14.41.1 Detailed Description

Indicates a condition that must be satisfied for the [Notification](#) to be triggered.

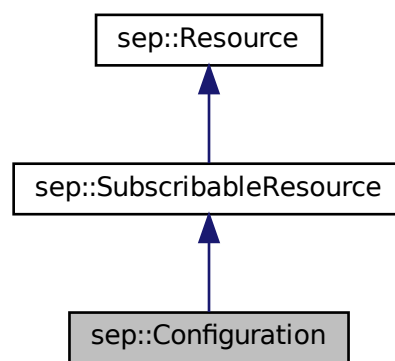
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscription.hpp

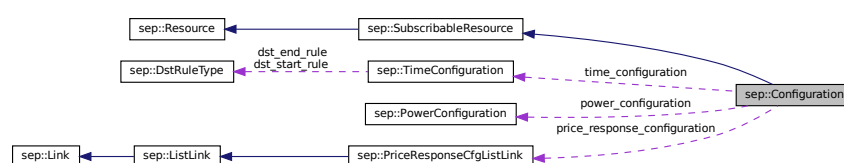
## 14.42 sep::Configuration Struct Reference

```
#include <configuration.hpp>
```

Inheritance diagram for sep::Configuration:



Collaboration diagram for sep::Configuration:





## Public Attributes

- LocaleType **current\_locale**
- [PowerConfiguration](#) **power\_configuration**
- [PriceResponseCfgListLink](#) **price\_response\_configuration**
- [TimeConfiguration](#) **time\_configuration**
- String32 **user\_device\_name**
- UInt32 **poll\_rate**

### 14.42.1 Detailed Description

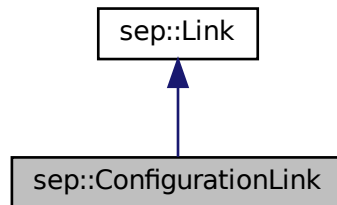
This resource contains various settings to control the operation of the device.

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

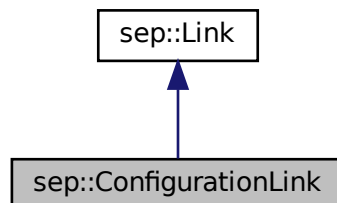
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/configuration.hpp`

## 14.43 sep::ConfigurationLink Struct Reference

Inheritance diagram for sep::ConfigurationLink:



Collaboration diagram for sep::ConfigurationLink:



## Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/configuration.hpp

## 14.44 sep::ConnectStatusType Struct Reference

### Public Types

- enum class **Status** : HexBinary16 {  
  **kConnected** = 0 , **kAvailable** = 1 << 0 , **kOperating** = 1 << 1 , **kTest** = 1 << 2 ,  
  **kFaultError** = 1 << 3 }

### Public Attributes

- TimeType **date\_time**
- Status **value**

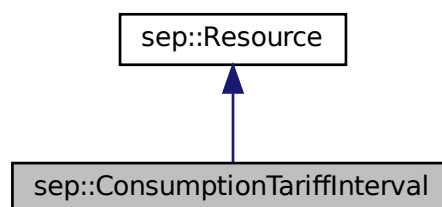
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/connect\_status\_type.hpp

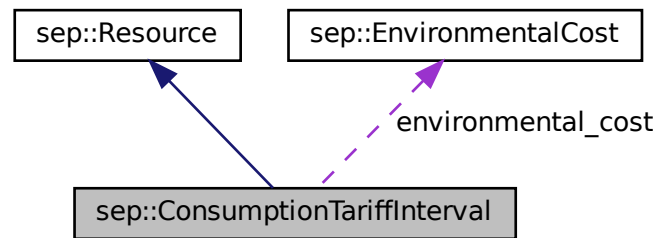
## 14.45 sep::ConsumptionTariffInterval Struct Reference

```
#include <consumption_tariff_interval.hpp>
```

Inheritance diagram for sep::ConsumptionTariffInterval:



Collaboration diagram for sep::ConsumptionTariffInterval:



## Public Types

- enum class **ConsumptionBlockType** : UInt8 {  
**BLOCK1** = 1 , **BLOCK2** , **BLOCK3** , **BLOCK4** ,  
**BLOCK5** , **BLOCK6** , **BLOCK7** , **BLOCK8** ,  
**BLOCK9** , **BLOCK10** , **BLOCK11** , **BLOCK12** ,  
**BLOCK13** , **BLOCK14** , **BLOCK15** , **BLOCK16** }

## Public Attributes

- ConsumptionBlockType **consumption\_block**
- [EnvironmentalCost](#) **environmental\_cost**
- Int32 **price**
- UInt48 **startValue**

### 14.45.1 Detailed Description

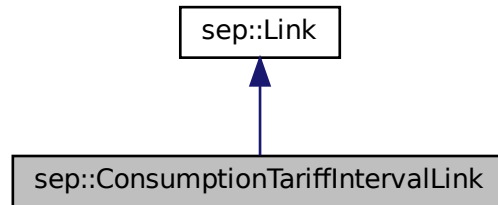
One of a sequence of thresholds defined in terms of consumption quantity of a service such as electricity, water, gas, etc. It defines the steps or blocks in a step tariff structure, where startValue simultaneously defines the entry value of this step and the closing value of the previous step. Where consumption is greater than startValue, it falls within this block and where consumption is less than or equal to startValue, it falls within one of the previous blocks.

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

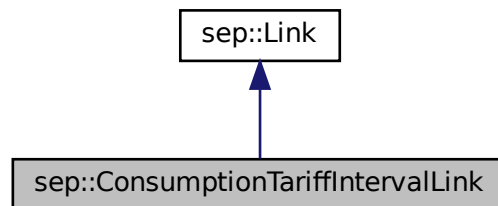
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/consumption\_tariff\_interval.hpp

## 14.46 sep::ConsumptionTariffIntervalLink Struct Reference

Inheritance diagram for sep::ConsumptionTariffIntervalLink:



Collaboration diagram for sep::ConsumptionTariffIntervalLink:



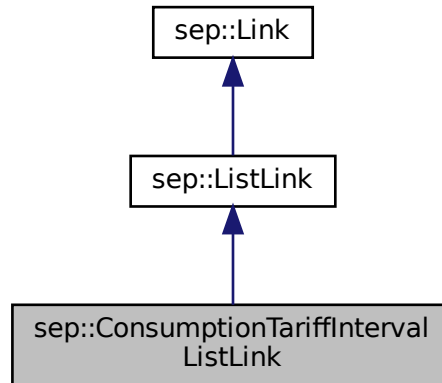
### Additional Inherited Members

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

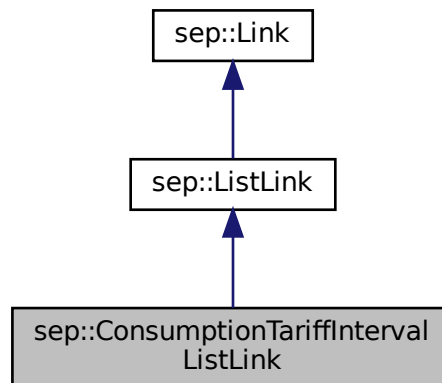
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/consumption\_tariff\_interval.hpp

## 14.47 sep::ConsumptionTariffIntervalListLink Struct Reference

Inheritance diagram for sep::ConsumptionTariffIntervalListLink:



Collaboration diagram for sep::ConsumptionTariffIntervalListLink:



### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/consumption\_tariff\_interval.hpp

## 14.48 https::Context Struct Reference

```
#include <abstract_client.hpp>
```

### Public Attributes

- `std::string id`
- `std::string root`
- `std::string host`
- `std::string port`

### 14.48.1 Detailed Description

HTTP context for clients to connect to a server

#### Parameters

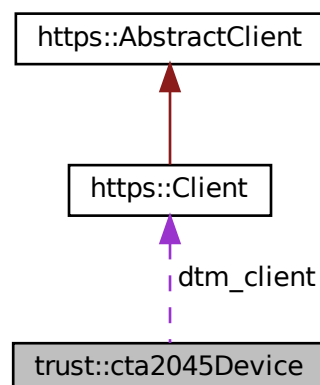
<i>id</i>	informs the client which ssl certificate it should load
<i>root</i>	points to the root path for the client to search for certificates
<i>host</i>	is the server dns/ip address
<i>port</i>	overrides the default 443 for https if the server requires it

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

- `/home/tylor/dev/does-egot-system/libs/https/client/include/https/client/abstract_client.hpp`

## 14.49 trust::cta2045Device Class Reference

Collaboration diagram for `trust::cta2045Device`:



## Public Member Functions

- **cta2045Device** ([cta2045Device](#) &other)=delete
- void **operator=** (const [cta2045Device](#) &)=delete
- [cta2045::DeviceInfo](#) **getDeviceInfo** ()
- [cta2045::commodity\\_map](#) **getCommodity** ()
- [cea2045::ResponseCodes](#) **getOperationalState** ()
- [cea2045::ResponseCodes](#) **getOutsideCommunicationStatus** ([cea2045::OutsideCommuncatonStatus](#)↔ Code code)
- [cea2045::ResponseCodes](#) **loadUp** (const uint8\_t duration)
- [cea2045::ResponseCodes](#) **shed** (const uint8\_t duration)
- [cea2045::ResponseCodes](#) **endShed** (const uint8\_t duration)
- [cea2045::ResponseCodes](#) **criticalPeakEvent** (const uint8\_t duration)
- [cea2045::ResponseCodes](#) **gridEmergency** (const uint8\_t duration)

## Static Public Member Functions

- static [cta2045Device](#) & **getInstance** (const std::string &ctx="", const [https::Context](#) &dtm={})

## Protected Member Functions

- **cta2045Device** (const std::string &ctx, const [https::Context](#) &dtm)

## Protected Attributes

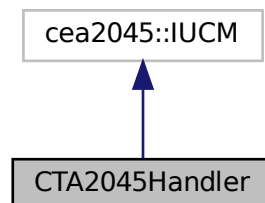
- [https::Client](#) dtm\_client

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

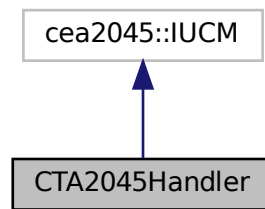
- /home/tylor/dev/does-egot-system/libs/trust/cta2045/include/trust/cta2045/trust\_device.hpp
- /home/tylor/dev/does-egot-system/libs/trust/cta2045/trust\_device.cpp

## 14.50 CTA2045Handler Class Reference

Inheritance diagram for CTA2045Handler:



Collaboration diagram for CTA2045Handler:



## Public Member Functions

- virtual bool **isMessageTypeSupported** (cea2045::MessageTypeCode messageType)
- virtual cea2045::MaxPayloadLengthCode **getMaxPayload** ()
- virtual void **processMaxPayloadResponse** (cea2045::MaxPayloadLengthCode maxPayload)
- virtual void **processDeviceInfoResponse** (cea2045::cea2045DeviceInfoResponse \*message)
- virtual void **processCommodityResponse** (cea2045::cea2045CommodityResponse \*message)
- virtual void **processSetEnergyPriceResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processSetTemperatureOffsetResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetTemperatureOffsetResponse** (cea2045::cea2045GetTemperateOffsetResponse \*message)
- virtual void **processSetSetpointsResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetSetpointsResponse** (cea2045::cea2045GetSetpointsResponse1 \*message)
- virtual void **processGetSetpointsResponse** (cea2045::cea2045GetSetpointsResponse2 \*message)
- virtual void **processStartCyclingResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processTerminateCyclingResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetPresentTemperatureResponse** (cea2045::cea2045GetPresentTemperatureResponse \*message)
- virtual void **processGetUTCTimeResponse** (cea2045::cea2045GetUTCTimeResponse \*message)
- virtual void **processAckReceived** (cea2045::MessageCode messageCode)
- virtual void **processNakReceived** (cea2045::LinkLayerNakCode nak, cea2045::MessageCode messageCode)
- virtual void **processAppAckReceived** (cea2045::cea2045Basic \*message)
- virtual void **processAppNakReceived** (cea2045::cea2045Basic \*message)
- virtual void **processOperationalStateReceived** (cea2045::cea2045Basic \*message)
- virtual void **processAppCustomerOverride** (cea2045::cea2045Basic \*message)
- virtual void **processIncompleteMessage** (const unsigned char \*buffer, unsigned int numBytes)

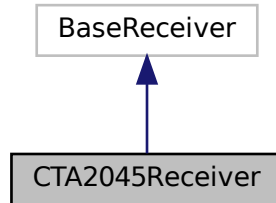
The documentation for this class was generated from the following files:

- /home/tylor/dev/doe-egot-system/libs/cta2045/include/cta2045/cta2045\_handler.hpp
- /home/tylor/dev/doe-egot-system/libs/cta2045/src/cta2045\_handler.cpp

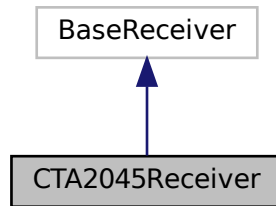


## 14.51 CTA2045Receiver Class Reference

Inheritance diagram for CTA2045Receiver:



Collaboration diagram for CTA2045Receiver:



### Public Member Functions

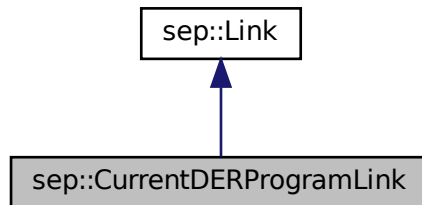
- **CTA2045Receiver** (CombinedHttpClient \*c)
- std::string **Import** ()
- std::string **Export** ()
- std::string **GetEnergy** ()
- std::string **GetNameplate** ()
- std::string **Idle** ()
- std::string **CriticalPeakEvent** ()
- std::string **GridEmergencyEvent** ()

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

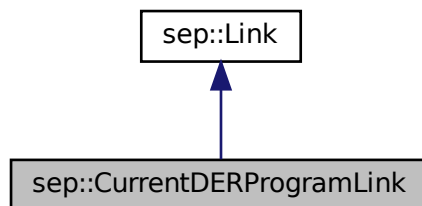
- /home/tylor/dev/does-egot-system/libs/cta2045/include/cta2045/cta2045\_receiver.hpp
- /home/tylor/dev/does-egot-system/libs/cta2045/src/cta2045\_receiver.cpp

## 14.52 sep::CurrentDERProgramLink Struct Reference

Inheritance diagram for sep::CurrentDERProgramLink:



Collaboration diagram for sep::CurrentDERProgramLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

## 14.53 sep::CurrentRMS Struct Reference

```
#include <current_rms.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UInt16 **value**

### 14.53.1 Detailed Description

Average flow of charge through a conductor.

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/current\_rms.hpp

## 14.54 sep::CurveData Struct Reference

```
#include <curve_data.hpp>
```

### Public Attributes

- bool **excitation**
- Int32 **x\_value**
- Int32 **y\_value**

### 14.54.1 Detailed Description

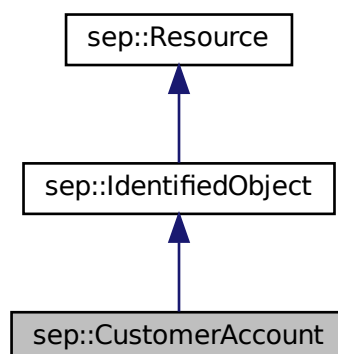
Data point values for defining a curve or schedule

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

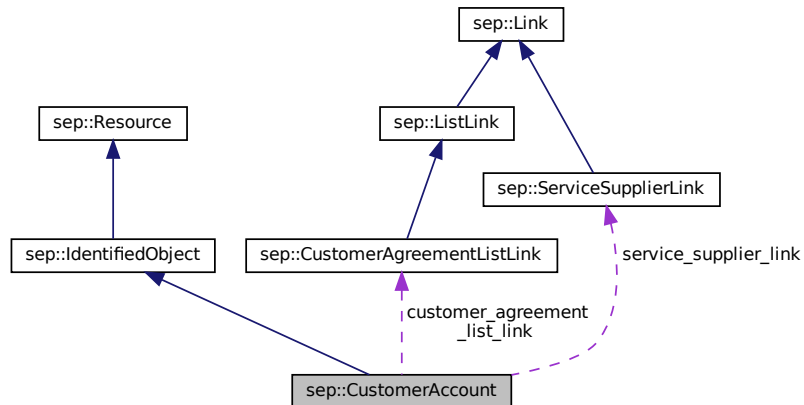
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/curve\_data.hpp

## 14.55 sep::CustomerAccount Struct Reference

Inheritance diagram for sep::CustomerAccount:



Collaboration diagram for sep::CustomerAccount:



## Public Attributes

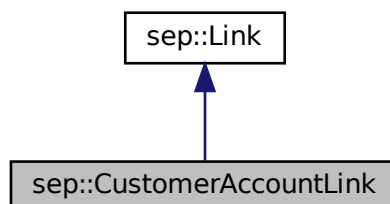
- UInt16 **currency**
- String42 **customer\_account**
- [CustomerAgreementListLink](#) **customer\_agreement\_list\_link**
- String42 **customer\_name**
- PowerOfTenMultiplierType **price\_power\_of\_ten\_multiplier**
- [ServiceSupplierLink](#) **service\_supplier\_link**

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

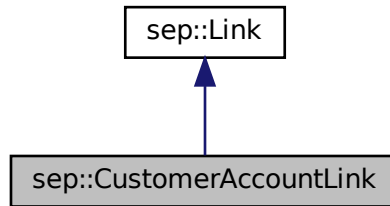
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/customer\_account.hpp

## 14.56 sep::CustomerAccountLink Struct Reference

Inheritance diagram for sep::CustomerAccountLink:



Collaboration diagram for sep::CustomerAccountLink:



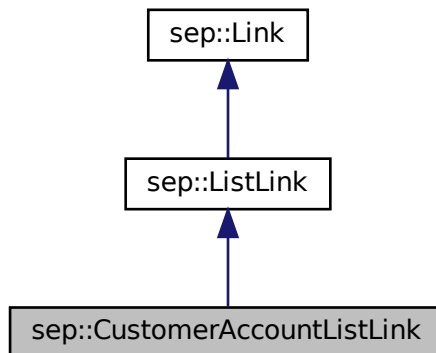
### Additional Inherited Members

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

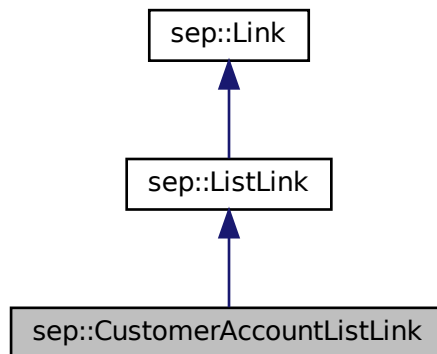
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/customer\_account.hpp

## 14.57 sep::CustomerAccountListLink Struct Reference

Inheritance diagram for sep::CustomerAccountListLink:



Collaboration diagram for sep::CustomerAccountListLink:



### Additional Inherited Members

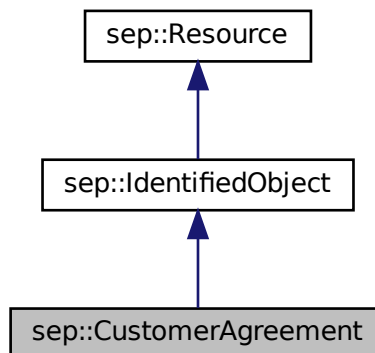
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/customer\_account.hpp

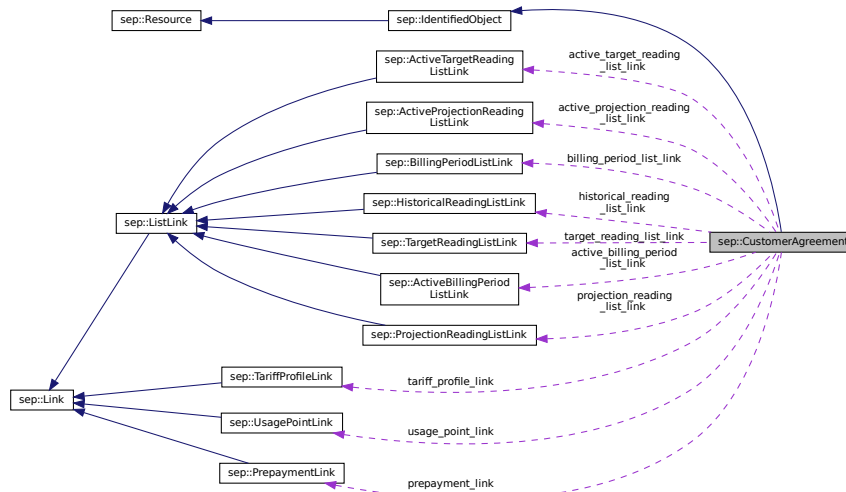
## 14.58 sep::CustomerAgreement Struct Reference

```
#include <customer_agreement.hpp>
```

Inheritance diagram for sep::CustomerAgreement:



Collaboration diagram for `sep::CustomerAgreement`:



## Public Attributes

- [ActiveBillingPeriodListLink](#) **active\_billing\_period\_list\_link**
- [ActiveProjectionReadingListLink](#) **active\_projection\_reading\_list\_link**
- [ActiveTargetReadingListLink](#) **active\_target\_reading\_list\_link**
- [BillingPeriodListLink](#) **billing\_period\_list\_link**
- [HistoricalReadingListLink](#) **historical\_reading\_list\_link**
- [PrepaymentLink](#) **prepayment\_link**
- [ProjectionReadingListLink](#) **projection\_reading\_list\_link**
- String42 **service\_account**
- String42 **service\_location**
- [TargetReadingListLink](#) **target\_reading\_list\_link**
- [TariffProfileLink](#) **tariff\_profile\_link**
- [UsagePointLink](#) **usage\_point\_link**

### 14.58.1 Detailed Description

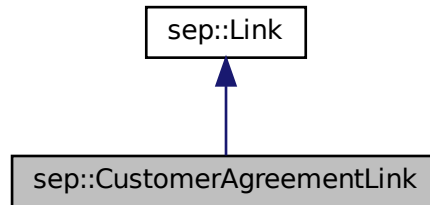
Agreement between the customer and the service supplier to pay for service at a specific service location. It records certain billing information about the type of service provided at the service location and is used during charge creation to determine the type of service.

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

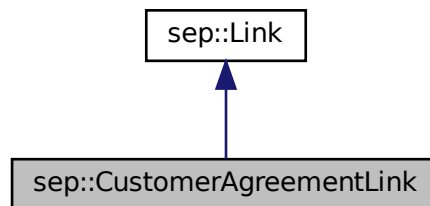
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/customer_agreement.hpp`

## 14.59 sep::CustomerAgreementLink Struct Reference

Inheritance diagram for sep::CustomerAgreementLink:



Collaboration diagram for sep::CustomerAgreementLink:



### Additional Inherited Members

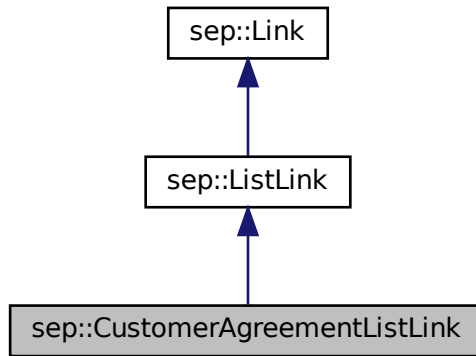
The documentation for this struct was generated from the following file:

- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/customer\_agreement.hpp

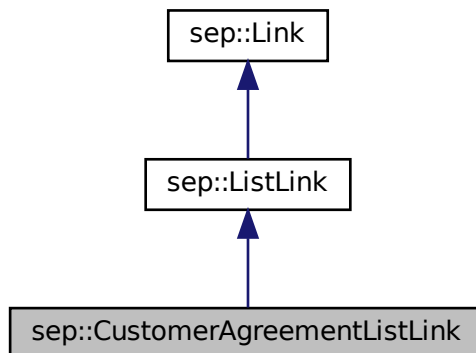


## 14.60 sep::CustomerAgreementListLink Struct Reference

Inheritance diagram for sep::CustomerAgreementListLink:



Collaboration diagram for sep::CustomerAgreementListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/customer\_agreement.hpp

## 14.61 sep::DateTimeInterval Struct Reference

```
#include <date_time_interval.hpp>
```

## Public Attributes

- Int32 **duration**
- TimeType **start**

### 14.61.1 Detailed Description

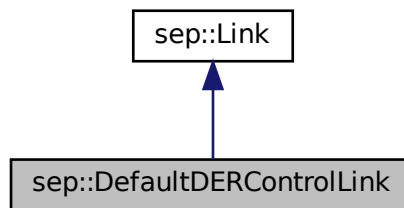
Interval of date and time

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

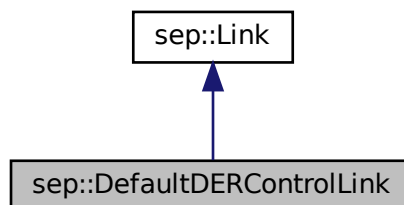
- /home/taylor/dev/dae-egot-system/libs/sep/models/include/sep/models/date\_time\_interval.hpp

## 14.62 sep::DefaultDERControlLink Struct Reference

Inheritance diagram for sep::DefaultDERControlLink:



Collaboration diagram for sep::DefaultDERControlLink:



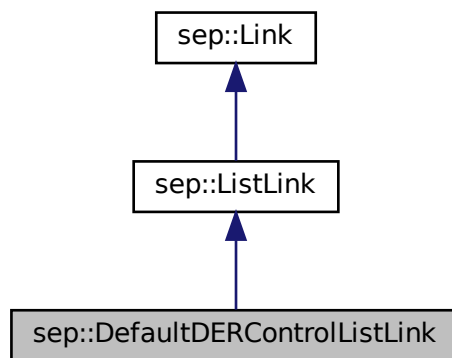
## Additional Inherited Members

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

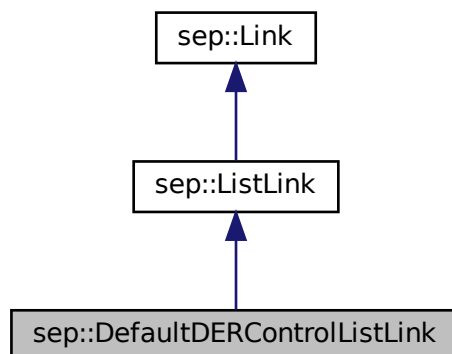
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

## 14.63 sep::DefaultDERControlListLink Struct Reference

Inheritance diagram for sep::DefaultDERControlListLink:



Collaboration diagram for sep::DefaultDERControlListLink:



## Additional Inherited Members

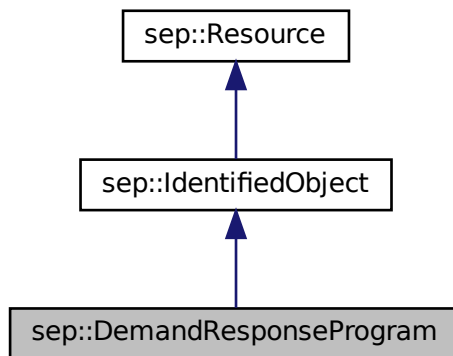
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

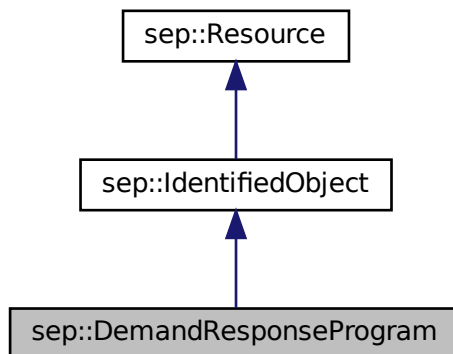
## 14.64 sep::DemandResponseProgram Struct Reference

```
#include <demand_response.hpp>
```

Inheritance diagram for sep::DemandResponseProgram:



Collaboration diagram for sep::DemandResponseProgram:



## Additional Inherited Members

### 14.64.1 Detailed Description

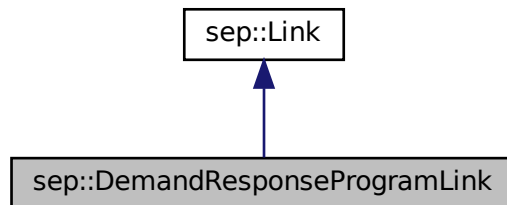
Demand response program.

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

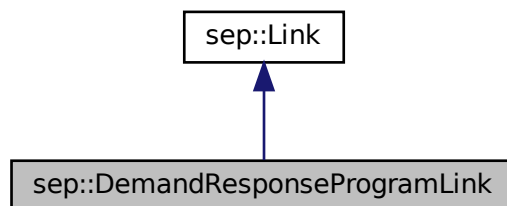
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/demand\_response.hpp

### 14.65 sep::DemandResponseProgramLink Struct Reference

Inheritance diagram for sep::DemandResponseProgramLink:



Collaboration diagram for sep::DemandResponseProgramLink:



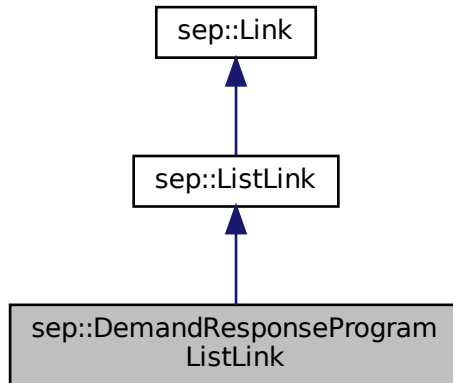
## Additional Inherited Members

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

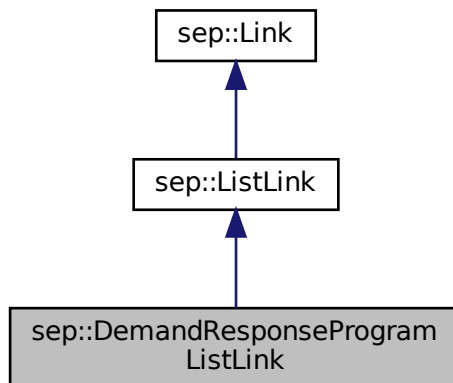
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/demand\_response.hpp

## 14.66 sep::DemandResponseProgramListLink Struct Reference

Inheritance diagram for sep::DemandResponseProgramListLink:



Collaboration diagram for sep::DemandResponseProgramListLink:



### Additional Inherited Members

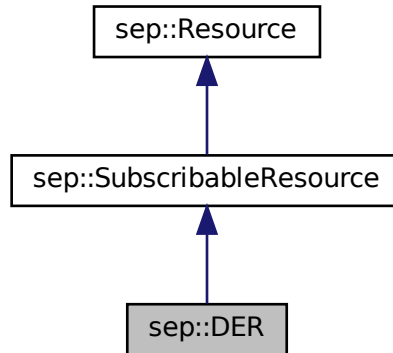
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/demand\_response.hpp

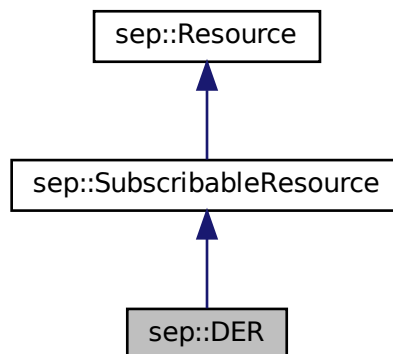
## 14.67 sep::DER Struct Reference

```
#include <der.hpp>
```

Inheritance diagram for sep::DER:



Collaboration diagram for sep::DER:



### Public Attributes

- boost::optional< [AssociatedDERProgramListLink](#) > **associated\_der\_program\_list\_link**
- boost::optional< [AssociatedUsagePointLink](#) > **associated\_usage\_program\_link**
- boost::optional< [CurrentDERProgramLink](#) > **current\_der\_program\_link**
- boost::optional< [DERAvailabilityLink](#) > **der\_availability\_link**
- boost::optional< [DERCapabilityLink](#) > **der\_capability\_link**
- boost::optional< [DERSettingsLink](#) > **der\_settings\_link**
- boost::optional< [DERStatusLink](#) > **der\_status\_link**

### 14.67.1 Detailed Description

Contains links to [DER](#) resources.

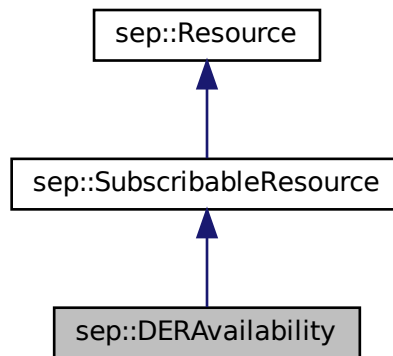
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der.hpp

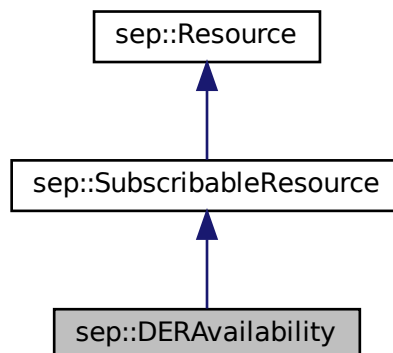
## 14.68 sep::DERAvailability Struct Reference

```
#include <der_availability.hpp>
```

Inheritance diagram for sep::DERAvailability:



Collaboration diagram for sep::DERAvailability:





## Public Attributes

- boost::optional< UInt32 > **availability\_duration**
- boost::optional< UInt32 > **max\_charge\_duration**
- TimeType **reading\_time**
- boost::optional< PerCent > **reserve\_charge\_percent**
- boost::optional< PerCent > **reserve\_percent**
- boost::optional< ReactivePower > **stat\_var\_avail**
- boost::optional< ActivePower > **stat\_w\_avail**

### 14.68.1 Detailed Description

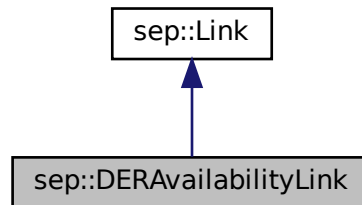
Indicates current reserve generation status

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

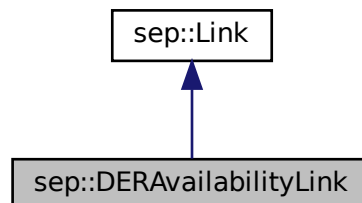
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_availability.hpp

## 14.69 sep::DERAvailabilityLink Struct Reference

Inheritance diagram for sep::DERAvailabilityLink:



Collaboration diagram for sep::DERAvailabilityLink:



## Additional Inherited Members

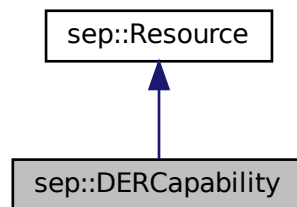
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_availability.hpp

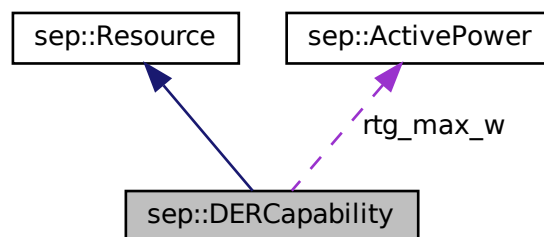
## 14.70 sep::DERCapability Struct Reference

```
#include <der_capability.hpp>
```

Inheritance diagram for sep::DERCapability:



Collaboration diagram for sep::DERCapability:



## Public Types

- enum class **AbnormalCategory** : UInt8 { **kNotSpecified** , **kI** , **kII** , **kIII** }
- enum class **NormalCategory** : UInt8 { **kNotSpecified** , **kA** , **kB** }

## Public Attributes

- DERControlType **modes\_supported**
- [ActivePower](#) **rtg\_max\_w**
- DERType **type**
- boost::optional< [AbnormalCategory](#) > **rtg\_abnormal\_category**
- boost::optional< [CurrentRMS](#) > **rtg\_max\_a**
- boost::optional< [AmpereHour](#) > **rtg\_max\_ah**
- boost::optional< [ApparentPower](#) > **rtg\_max\_charge\_rate\_va**
- boost::optional< [ActivePower](#) > **rtg\_max\_charge\_rate\_w**
- boost::optional< [ApparentPower](#) > **rtg\_max\_discharge\_rate\_va**
- boost::optional< [ActivePower](#) > **rtg\_max\_discharge\_rate\_w**
- boost::optional< [VoltageRMS](#) > **rtg\_max\_v**
- boost::optional< [ApparentPower](#) > **rtg\_max\_va**
- boost::optional< [ReactivePower](#) > **rtg\_max\_var**
- boost::optional< [ReactivePower](#) > **rtg\_max\_var\_neg**
- boost::optional< [WattHour](#) > **rtg\_max\_wh**
- boost::optional< [PowerFactor](#) > **rtg\_min\_pf\_over\_excited**
- boost::optional< [PowerFactor](#) > **rtg\_min\_pf\_under\_excited**
- boost::optional< [VoltageRMS](#) > **rtg\_min\_v**
- boost::optional< [NormalCategory](#) > **rtg\_normal\_category**
- boost::optional< [PowerFactor](#) > **rtg\_over\_excited\_pf**
- boost::optional< [ActivePower](#) > **rtg\_over\_excited\_w**
- boost::optional< [ReactivePower](#) > **rtg\_reactive\_susceptance**
- boost::optional< [PowerFactor](#) > **rtg\_under\_excited\_pf**
- boost::optional< [ActivePower](#) > **rtg\_under\_excited\_w**
- boost::optional< [VoltageRMS](#) > **rtg\_v\_nom**

### 14.70.1 Detailed Description

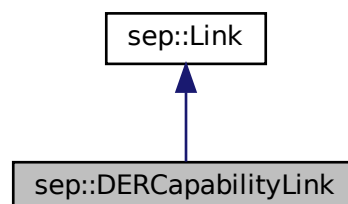
Distributed energy resource type and nameplate ratings.

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

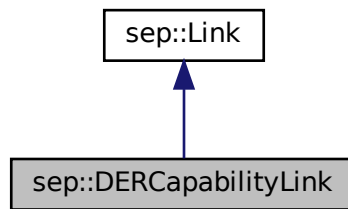
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_capability.hpp

## 14.71 sep::DERCapabilityLink Struct Reference

Inheritance diagram for sep::DERCapabilityLink:



Collaboration diagram for sep::DERCapabilityLink:



### Additional Inherited Members

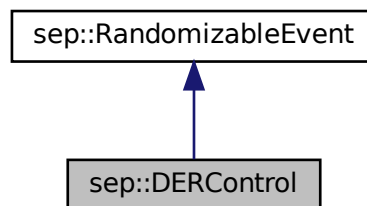
The documentation for this struct was generated from the following file:

- /home/taylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_capability.hpp

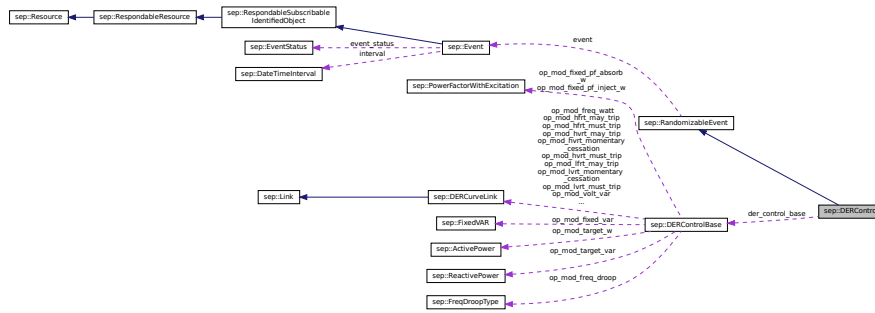
## 14.72 sep::DERControl Struct Reference

```
#include <der_control.hpp>
```

Inheritance diagram for sep::DERControl:



Collaboration diagram for sep::DERControl:



**Public Attributes**

- [DERControlBase](#) **der\_control\_base**
- DeviceCategoryType **device\_category**

**14.72.1 Detailed Description**

Distributed [Energy Resource](#) (DER) time/event-based control.

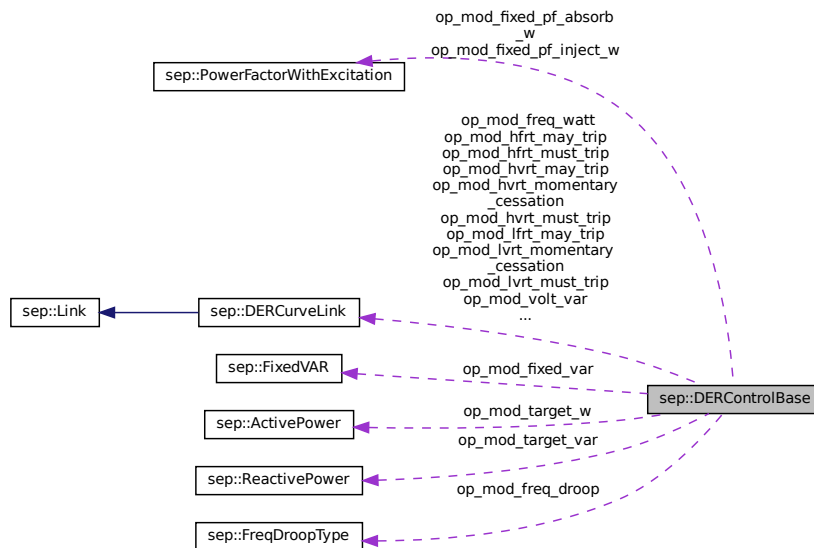
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

**14.73 sep::DERControlBase Struct Reference**

```
#include <der_control_base.hpp>
```

Collaboration diagram for sep::DERControlBase:



## Public Attributes

- bool `op_mod_connect`
- bool `op_mod_energize`
- [PowerFactorWithExcitation](#) `op_mod_fixed_pf_absorb_w`
- [PowerFactorWithExcitation](#) `op_mod_fixed_pf_inject_w`
- [FixedVAR](#) `op_mod_fixed_var`
- SignedPerCent `op_mod_fixed_w`
- [FreqDroopType](#) `op_mod_freq_droop`
- [DERCurveLink](#) `op_mod_freq_watt`
- [DERCurveLink](#) `op_mod_hfirt_may_trip`
- [DERCurveLink](#) `op_mod_hfirt_must_trip`
- [DERCurveLink](#) `op_mod_hvrt_may_trip`
- [DERCurveLink](#) `op_mod_hvrt_momentary_cessation`
- [DERCurveLink](#) `op_mod_hvrt_must_trip`
- [DERCurveLink](#) `op_mod_lfirt_may_trip`
- [DERCurveLink](#) `op_mod_lvrt_momentary_cessation`
- [DERCurveLink](#) `op_mod_lvrt_must_trip`
- PerCent `op_mod_max_lim_w`
- [ReactivePower](#) `op_mod_target_var`
- [ActivePower](#) `op_mod_target_w`
- [DERCurveLink](#) `op_mod_volt_var`
- [DERCurveLink](#) `op_mod_volt_watt`
- [DERCurveLink](#) `op_mod_watt_pf`
- [DERCurveLink](#) `op_mod_watt_var`
- UInt16 `ramp_tms`

### 14.73.1 Detailed Description

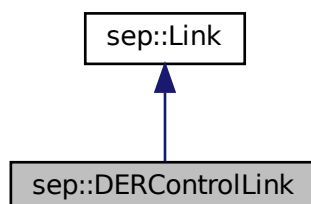
Distributed [Energy Resource](#) (DER) control values.

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

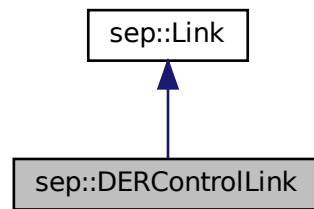
- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der_control_base.hpp`

## 14.74 sep::DERControlLink Struct Reference

Inheritance diagram for sep::DERControlLink:



Collaboration diagram for sep::DERControlLink:



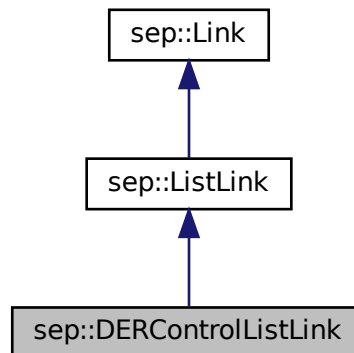
### Additional Inherited Members

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

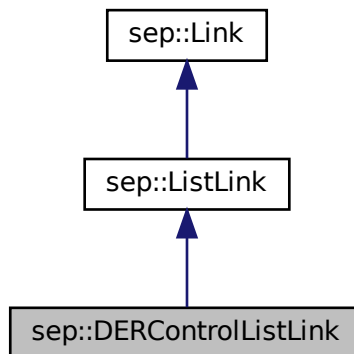
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

## 14.75 sep::DERControlListLink Struct Reference

Inheritance diagram for sep::DERControlListLink:



Collaboration diagram for sep::DERControlListLink:



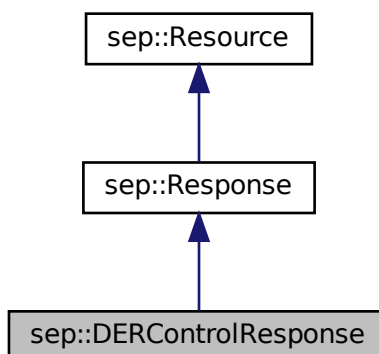
### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_control.hpp

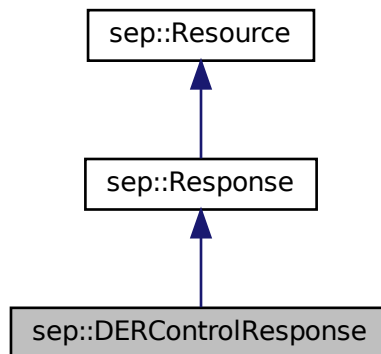
## 14.76 sep::DERControlResponse Struct Reference

Inheritance diagram for sep::DERControlResponse:





Collaboration diagram for sep::DERControlResponse:



### Additional Inherited Members

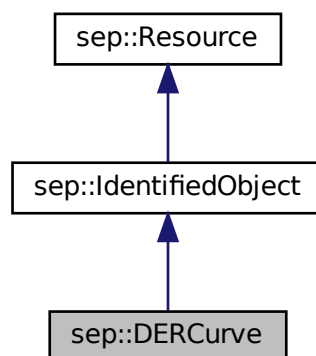
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_control\_response.hpp

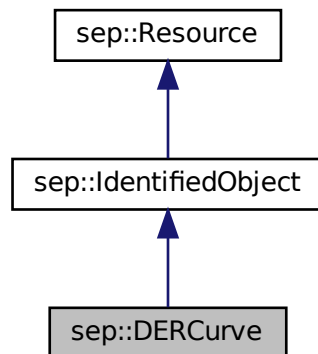
## 14.77 sep::DERCurve Struct Reference

```
#include <der_curve.hpp>
```

Inheritance diagram for sep::DERCurve:



Collaboration diagram for sep::DERCurve:



## Public Attributes

- bool **autonomous\_vref\_enable**
- UInt32 **autonomous\_vref\_time\_constant**
- TimeType **creation\_time**
- std::vector< [CurveData](#) > **curve\_data**
- DERCurveType **curve\_type**
- UInt16 **open\_loop\_tms**
- UInt16 **ramp\_dec\_tms**
- UInt16 **ramp\_inc\_tms**
- UInt16 **ramp\_pt1\_tms**
- Percent **vref**
- PowerOfTenMultiplierType **x\_multiplier**
- PowerOfTenMultiplierType **y\_multiplier**
- DERUnitRefType **y\_ref\_type**

### 14.77.1 Detailed Description

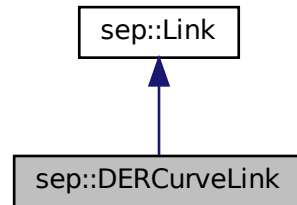
**DER** related curves such as Volt-Var mode curves. Relationship between an independent variable (X-axis) and a dependent variable (Y-axis).

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

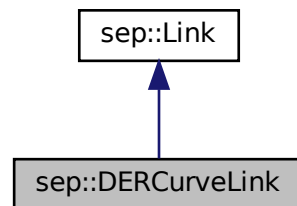
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der\_curve.hpp

## 14.78 sep::DERCurveLink Struct Reference

Inheritance diagram for sep::DERCurveLink:



Collaboration diagram for sep::DERCurveLink:



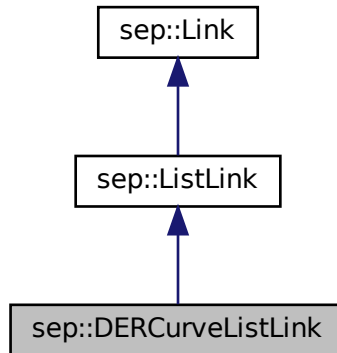
### Additional Inherited Members

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

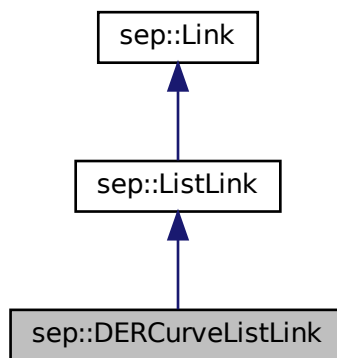
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der\_curve.hpp

## 14.79 sep::DERCurveListLink Struct Reference

Inheritance diagram for sep::DERCurveListLink:



Collaboration diagram for sep::DERCurveListLink:



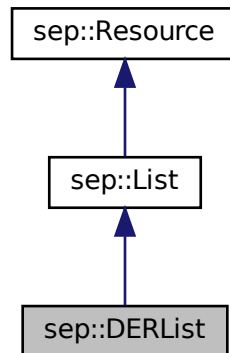
### Additional Inherited Members

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

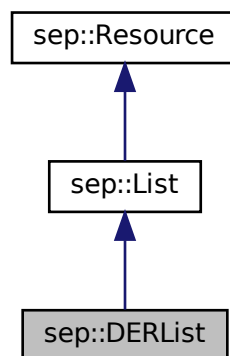
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der\_curve.hpp

## 14.80 sep::DERList Struct Reference

Inheritance diagram for sep::DERList:



Collaboration diagram for sep::DERList:



### Public Attributes

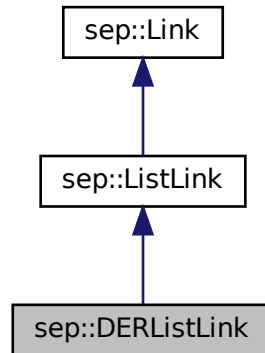
- `std::vector< DER > ders`
- `sep::UInt32 poll_rate = 900`

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

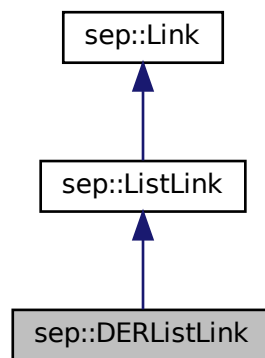
- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der.hpp`

## 14.81 sep::DERListLink Struct Reference

Inheritance diagram for sep::DERListLink:



Collaboration diagram for sep::DERListLink:



### Additional Inherited Members

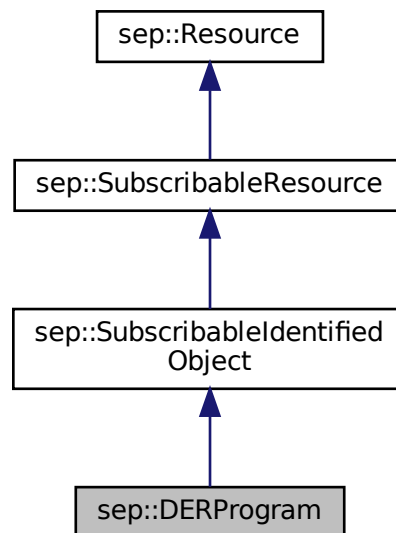
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der.hpp

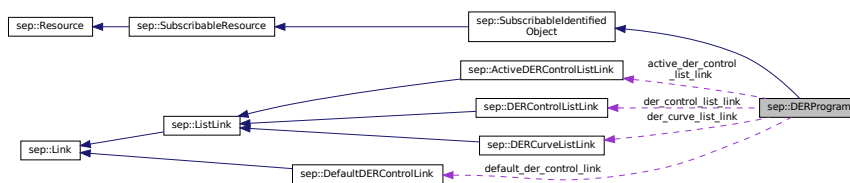
## 14.82 sep::DERProgram Struct Reference

```
#include <der_program.hpp>
```

Inheritance diagram for sep::DERProgram:



Collaboration diagram for sep::DERProgram:



### Public Attributes

- [ActiveDERControlListLink](#) `active_der_control_list_link`
- [DefaultDERControlLink](#) `default_der_control_link`
- [DERControlListLink](#) `der_control_list_link`
- [DERCurveListLink](#) `der_curve_list_link`
- `PrimacyType` `primacy`

### 14.82.1 Detailed Description

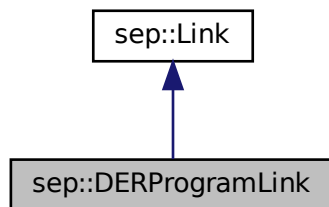
Distributed [Energy Resource](#) program

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

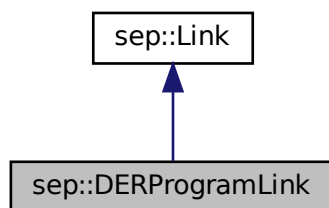
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

## 14.83 sep::DERProgramLink Struct Reference

Inheritance diagram for sep::DERProgramLink:



Collaboration diagram for sep::DERProgramLink:



### Additional Inherited Members

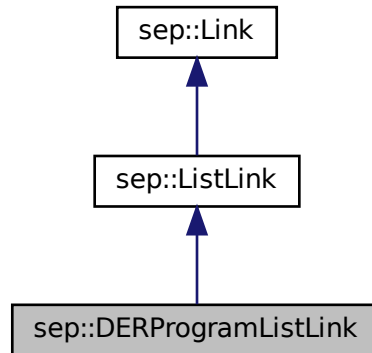
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

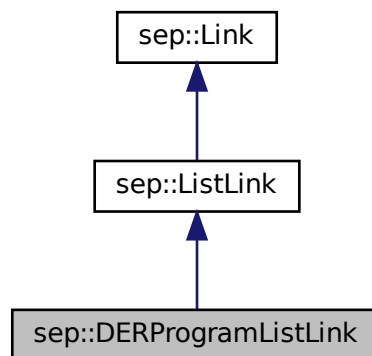


## 14.84 sep::DERProgramListLink Struct Reference

Inheritance diagram for sep::DERProgramListLink:



Collaboration diagram for sep::DERProgramListLink:



### Additional Inherited Members

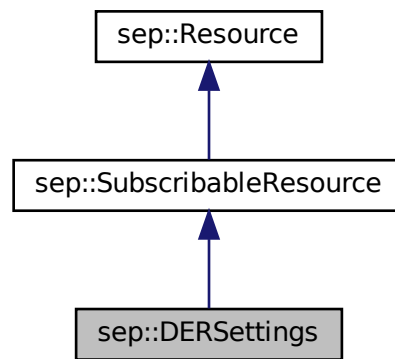
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der\_program.hpp

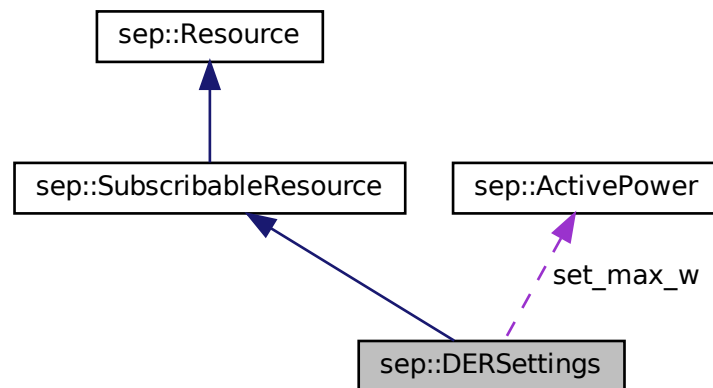
## 14.85 sep::DERSettings Struct Reference

```
#include <der_settings.hpp>
```

Inheritance diagram for sep::DERSettings:



Collaboration diagram for sep::DERSettings:



### Public Attributes

- UInt16 `set_grad_w`
- `ActivePower` `set_max_w`
- TimeType `updated_time`
- `boost::optional< DERControlType >` `modes_enabled`

- boost::optional< UInt32 > **set\_es\_delay**
- boost::optional< UInt16 > **set\_es\_high\_freq**
- boost::optional< UInt16 > **set\_es\_low\_freq**
- boost::optional< UInt16 > **set\_es\_high\_volt**
- boost::optional< UInt16 > **set\_es\_low\_volt**
- boost::optional< UInt32 > **set\_es\_ramp\_tms**
- boost::optional< UInt32 > **set\_es\_random\_delay**
- boost::optional< UInt16 > **set\_soft\_grad\_w**
- boost::optional< [CurrentRMS](#) > **set\_max\_a**
- boost::optional< [AmpereHour](#) > **set\_max\_ah**
- boost::optional< [ApparentPower](#) > **set\_max\_charge\_rate\_va**
- boost::optional< [ActivePower](#) > **set\_max\_charge\_rate\_w**
- boost::optional< [ApparentPower](#) > **set\_max\_discharge\_rate\_va**
- boost::optional< [ActivePower](#) > **set\_max\_discharge\_rate\_w**
- boost::optional< [VoltageRMS](#) > **set\_max\_v**
- boost::optional< [ApparentPower](#) > **set\_max\_va**
- boost::optional< [ReactivePower](#) > **set\_max\_var**
- boost::optional< [ReactivePower](#) > **set\_max\_var\_neg**
- boost::optional< [WattHour](#) > **set\_max\_wh**
- boost::optional< [PowerFactor](#) > **set\_min\_pf\_over\_excited**
- boost::optional< [PowerFactor](#) > **set\_min\_pf\_under\_excited**
- boost::optional< [VoltageRMS](#) > **set\_min\_v**
- boost::optional< [VoltageRMS](#) > **set\_v\_nom**
- boost::optional< [VoltageRMS](#) > **set\_v\_ref**
- boost::optional< [VoltageRMS](#) > **set\_v\_ref\_ofs**

### 14.85.1 Detailed Description

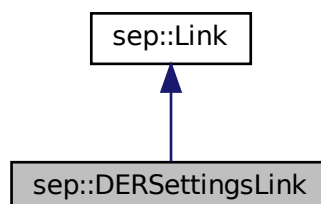
Distributed energy resource settings

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

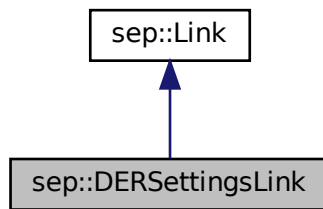
- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/der_settings.hpp`

## 14.86 sep::DERSettingsLink Struct Reference

Inheritance diagram for sep::DERSettingsLink:



Collaboration diagram for sep::DERSettingsLink:



### Additional Inherited Members

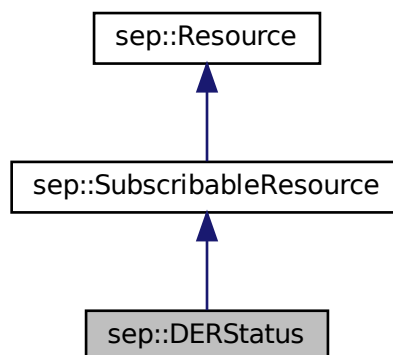
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_settings.hpp

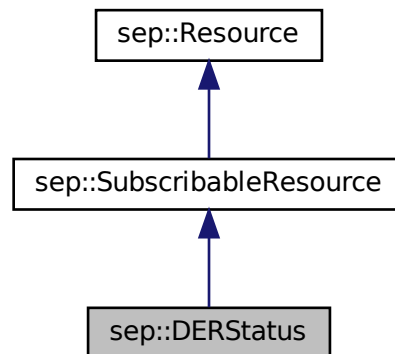
## 14.87 sep::DERStatus Struct Reference

```
#include <der_status.hpp>
```

Inheritance diagram for sep::DERStatus:



Collaboration diagram for sep::DERStatus:



## Public Types

- enum class **AlarmStatus** : HexBinary16 {  
**kOverCurrent** = 0 , **kOverVoltage** = 1 << 0 , **kUnderVoltage** = 1 << 1 , **kOverFrequency** = 1 << 2 ,  
**kUnderFrequency** = 1 << 3 , **kVoltageImbalance** = 1 << 4 , **kCurrentImbalance** = 1 << 5 , **kEmergencyLocal** = 1 << 6 ,  
**kEmergencyRemote** = 1 << 7 , **kLowPowerInput** = 1 << 8 , **kPhaseRotation** = 1 << 9 }

## Public Attributes

- TimeType **reading\_time**
- boost::optional< AlarmStatus > **alarm\_status**
- boost::optional< [ConnectStatusType](#) > **gen\_connection\_status**
- boost::optional< [InverterStatusType](#) > **inverter\_status**
- boost::optional< [LocalControlModeStatusType](#) > **local\_control\_mode\_status**
- boost::optional< [ManufacturerStatusType](#) > **manufacturer\_status**
- boost::optional< [OperationalModeStatusType](#) > **operational\_mode\_status**
- boost::optional< [StateOfChargeStatusType](#) > **state\_of\_charge\_status**
- boost::optional< [StorageModeStatusType](#) > **storage\_mode\_status**
- boost::optional< [ConnectStatusType](#) > **stor\_connect\_status**

### 14.87.1 Detailed Description

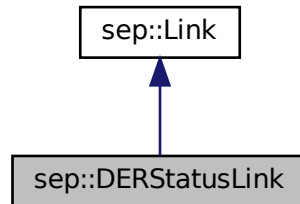
[DER](#) status information

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

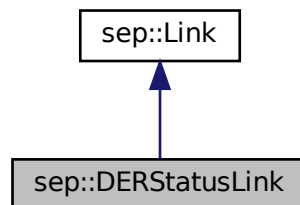
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/der\_status.hpp

## 14.88 sep::DERStatusLink Struct Reference

Inheritance diagram for sep::DERStatusLink:



Collaboration diagram for sep::DERStatusLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/der\_status.hpp

## 14.89 cta2045::Device Class Reference

### Public Member Functions

- **Device** (**Device** &other)=delete
- void **operator=** (const **Device** &)=delete
- **DeviceInfo** **getDeviceInfo** ()
- commodity\_map **getCommodity** ()
- cea2045::ResponseCodes **loadUp** (const uint8\_t duration=0)
- cea2045::ResponseCodes **shed** (const uint8\_t duration=0)
- cea2045::ResponseCodes **endShed** (const uint8\_t duration=0)
- cea2045::ResponseCodes **criticalPeakEvent** (const uint8\_t duration=0)
- cea2045::ResponseCodes **gridEmergency** (const uint8\_t duration=0)

## Static Public Member Functions

- static [Device](#) \* **getInstance** (const std::string &context)

## Protected Member Functions

- **Device** (const std::string &context)

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

- /home/tylor/dev/does-egot-system/libs/cta2045/include/cta2045/device.hpp
- /home/tylor/dev/does-egot-system/libs/cta2045/src/device.cpp

## 14.90 Device Class Reference

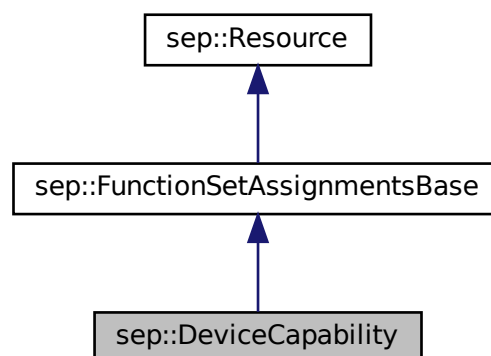
The documentation for this class was generated from the following files:

- /home/tylor/dev/does-egot-system/libs/sunspec-modbus/include/sunspec/device.hpp
- /home/tylor/dev/does-egot-system/libs/sunspec-modbus/device.cpp

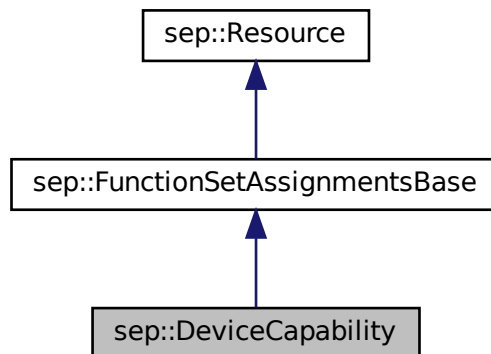
## 14.91 sep::DeviceCapability Struct Reference

```
#include <device_capability.hpp>
```

Inheritance diagram for sep::DeviceCapability:



Collaboration diagram for sep::DeviceCapability:



### Public Attributes

- UInt32 **poll\_rate** = 900
- boost::optional< [EndDeviceListLink](#) > **end\_device\_list\_link**
- boost::optional< [MirrorUsagePointListLink](#) > **mirror\_usage\_point\_list\_link**
- boost::optional< [SelfDeviceLink](#) > **self\_device\_link**

### 14.91.1 Detailed Description

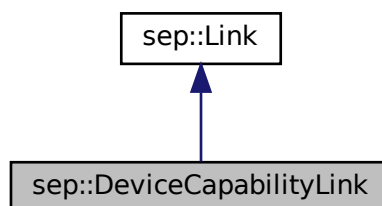
Returned by the URI provided by DNS-SD, to allow clients to find the URIs to the resources in which they are interested.

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_capability.hpp

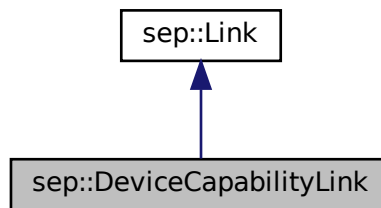
## 14.92 sep::DeviceCapabilityLink Struct Reference

Inheritance diagram for sep::DeviceCapabilityLink:





Collaboration diagram for sep::DeviceCapabilityLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_capability.hpp

## 14.93 cta2045::DeviceInfo Struct Reference

### Public Attributes

- uint32\_t **device\_type**
- uint32\_t **capability\_map**
- uint32\_t **vendor\_id**
- uint32\_t **firmware\_year**
- uint32\_t **firmware\_month**
- uint32\_t **firmware\_day**
- uint32\_t **firmware\_major**
- uint32\_t **firmware\_minor**

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

- /home/tylor/dev/does-egot-system/libs/cta2045/include/cta2045/ucm.hpp
- /home/tylor/dev/does-egot-system/libs/trust/cta2045/include/trust/cta2045/trust\_ucm.hpp

## 14.94 DeviceInfo Struct Reference

### Public Attributes

- unsigned short **deviceType**
- unsigned short **vendorId**
- unsigned short **firmwareYear**
- unsigned short **firmwareMonth**
- unsigned short **firmwareDay**

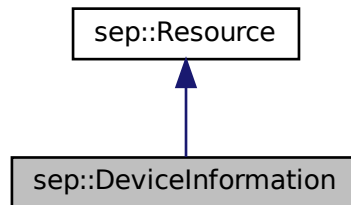
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/cta2045/include/cta2045/cta2045\_handler.hpp

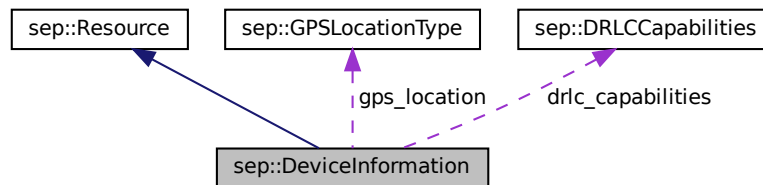
## 14.95 sep::DeviceInformation Struct Reference

```
#include <device_information.hpp>
```

Inheritance diagram for sep::DeviceInformation:



Collaboration diagram for sep::DeviceInformation:



### Public Types

- enum class **FunctionsImplemented** : HexBinary64 {
 **kDeviceCapability** = 0 << 1 , **kSelfDevice** = 0 << 2 , **kEndDevice** = 0 << 3 , **kFunctionSetAssignments** = 0 << 4 ,
 **kSubscriptionNotification** = 0 << 5 , **kResponse** = 0 << 6 , **kTime** = 0 << 7 , **kDeviceInformation** = 0 << 8 ,
 **kPowerStatus** = 0 << 9 , **kNetworkStatus** = 0 << 10 , **kLogEvent** = 0 << 11 , **kConfiguration** = 0 << 12 ,
 **kSoftwareDownload** = 0 << 13 , **kDRLC** = 0 << 14 , **kMetering** = 0 << 15 , **kPricing** = 0 << 16 ,
 **kMessaging** = 0 << 17 , **kBilling** = 0 << 18 , **kPrepayment** = 0 << 19 , **kFlowReservation** = 0 << 20 ,
 **kDERControl** = 0 << 21 }

### Public Attributes

- [DRLCCapabilities](#) **drlc\_capabilities**
- FunctionsImplemented **function\_implemented**
- [GPSLocationType](#) **gps\_location**

### 14.95.1 Detailed Description

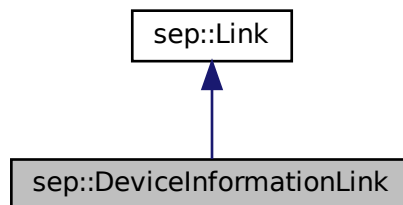
Contains identification and other information about the device that changes very infrequently, typically only when updates are applied, if ever.

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

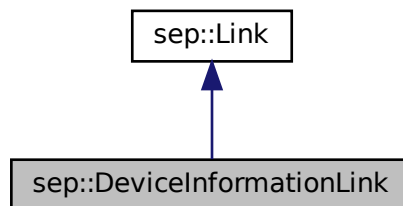
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_information.hpp

### 14.96 sep::DeviceInformationLink Struct Reference

Inheritance diagram for sep::DeviceInformationLink:



Collaboration diagram for sep::DeviceInformationLink:



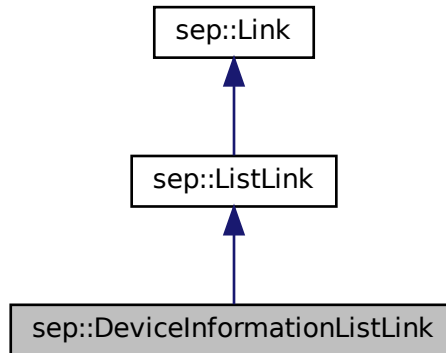
### Additional Inherited Members

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

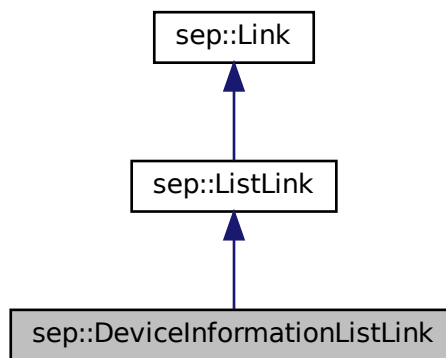
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_information.hpp

## 14.97 sep::DeviceInformationListLink Struct Reference

Inheritance diagram for sep::DeviceInformationListLink:



Collaboration diagram for sep::DeviceInformationListLink:



### Additional Inherited Members

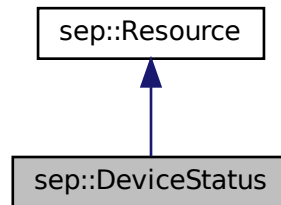
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/device\_information.hpp

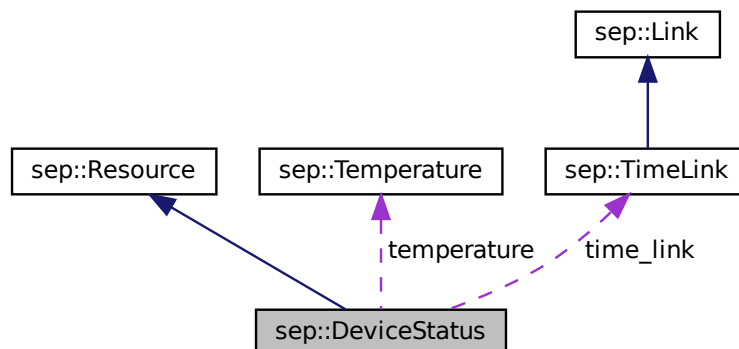
## 14.98 sep::DeviceStatus Struct Reference

```
#include <device_status.hpp>
```

Inheritance diagram for sep::DeviceStatus:



Collaboration diagram for sep::DeviceStatus:



### Public Types

- enum class **OpState** : UInt8 {  
**kUnknown** , **kNotOperating** , **kOperating** , **kStartingUp** ,  
**kShuttingDown** , **kAtDisconnectLevel** , **kRampingKiloWatt** , **kRampingKiloVar** }

### Public Attributes

- TimeType **changed\_time**
- UInt16 **on\_count**
- OpState **op\_state**
- UInt32 **op\_time**
- [Temperature](#) **temperature**
- [TimeLink](#) **time\_link**
- UInt32 **poll\_rate**

### 14.98.1 Detailed Description

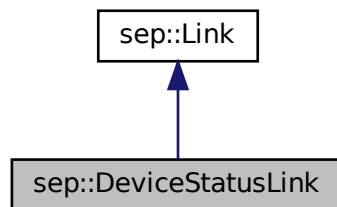
Status of device

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

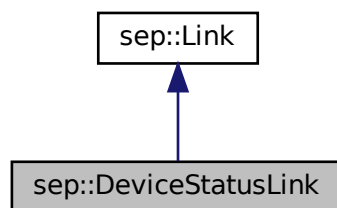
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_status.hpp

## 14.99 sep::DeviceStatusLink Struct Reference

Inheritance diagram for sep::DeviceStatusLink:



Collaboration diagram for sep::DeviceStatusLink:



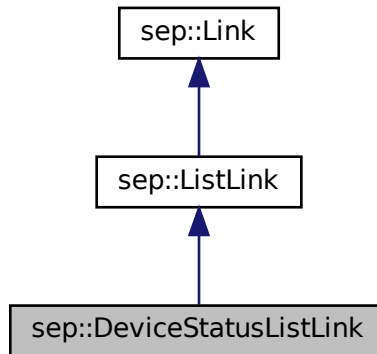
### Additional Inherited Members

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

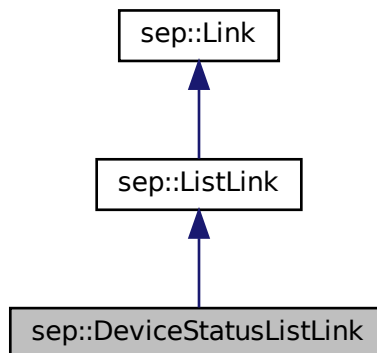
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_status.hpp

## 14.100 sep::DeviceStatusListLink Struct Reference

Inheritance diagram for sep::DeviceStatusListLink:



Collaboration diagram for sep::DeviceStatusListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/device\_status.hpp

## 14.101 sep::DRLCCapabilities Struct Reference

```
#include <drlc_capabilities.hpp>
```

## Public Types

- enum class **Options** : UInt32 {  
**kKiloWattHours** = 0 << 1 , **kKiloWatts** = 0 << 2 , **kWatts** = 0 << 3 , **kCubicMeters** = 0 << 4 ,  
**kCubicFeet** = 0 << 5 , **kUSGallons** = 0 << 6 , **kImperialGallons** = 0 << 7 , **kBTUs** = 0 << 8 ,  
**kLiters** = 0 << 9 , **kKiloPascalsGauge** = 0 << 10 , **kKiloPascalsAbsolute** = 0 << 11 , **kMegaJoule** = 0  
<< 12 ,  
**kUnitless** = 0 << 13 , **kTemperatureSetPoint** = 0 << 17 , **kTemperatureOffset** = 0 << 18 , **kDutyCycle**  
= 0 << 19 ,  
**kLoadAdjustmentPercentage** = 0 << 20 , **kApplianceLoadReduction** = 0 << 21 }

### 14.101.1 Detailed Description

Contains information about the static capabilities of the device, to allow service providers to know what types of functions are supported, what the normal operating ranges and limits are, and other similar information, in order to provide better suggestions of applicable programs to receive the maximum benefit.

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

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/drlc_capabilities.hpp`

## 14.102 sep::DstRuleType Struct Reference

```
#include <dst_rule_type.hpp>
```

## Public Types

- enum class **Operator** : UInt8 {  
**kDayOfMonth** , **kDayOfWeek** , **kFirstOccurrence** , **kSecondOccurrence** ,  
**kThirdOccurrence** , **kFourthOccurrence** , **kFifthOccurrence** , **kLastOccurrence** }

## Public Attributes

- uint16\_t **seconds**
- uint8\_t **hours**
- uint8\_t **day\_of\_the\_week**
- uint8\_t **day\_of\_the\_month**
- Operator **op\_code**
- uint8\_t **month**

### 14.102.1 Detailed Description

Bit map encoded rule from which is calculated the start or end time, within the current year, to which daylight savings time offset must be applied.

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

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/dst_rule_type.hpp`



## 14.103 sep::DutyCycle Struct Reference

```
#include <duty_cycle.hpp>
```

### Public Attributes

- UInt8 `normal_value`

### 14.103.1 Detailed Description

Duty cycle control is a device specific issue and is managed by the device. The duty cycle of the device under control should span the shortest practical time period in accordance with the nature of the device under control and the intent of the request for demand reduction. The default factory setting SHOULD be three minutes for each 10% of duty cycle. This indicates that the default time period over which a duty cycle is applied is 30 minutes, meaning a 10% duty cycle would cause a device to be ON for 3 minutes. The “off state” SHALL precede the “on state”.

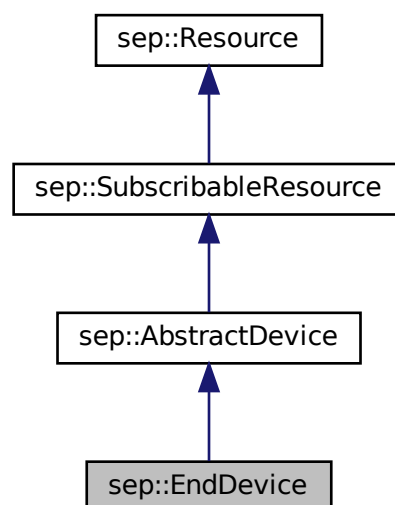
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/duty_cycle.hpp`

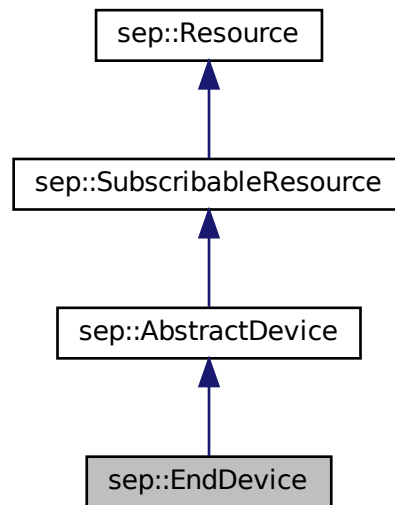
## 14.104 sep::EndDevice Struct Reference

```
#include <end_device.hpp>
```

Inheritance diagram for sep::EndDevice:



Collaboration diagram for sep::EndDevice:



## Public Attributes

- TimeType **changed\_time**
- boost::optional< bool > **enabled**
- boost::optional< [FlowReservationRequestListLink](#) > **flow\_reservation\_request\_list\_link**
- boost::optional< [FlowReservationResponseListLink](#) > **flow\_reservation\_response\_list\_link**
- boost::optional< [FunctionSetAssignmentsListLink](#) > **function\_set\_assignments\_list\_link**
- boost::optional< UInt32 > **post\_rate**
- boost::optional< [RegistrationLink](#) > **registration\_link**
- boost::optional< [SubscriptionListLink](#) > **subscription\_list\_link**

### 14.104.1 Detailed Description

Asset container that performs one or more end device functions. Contains information about individual devices in the network.

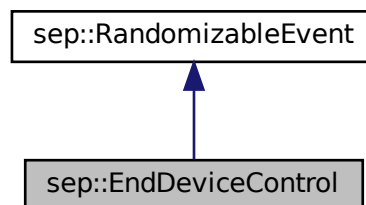
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/end_device.hpp`

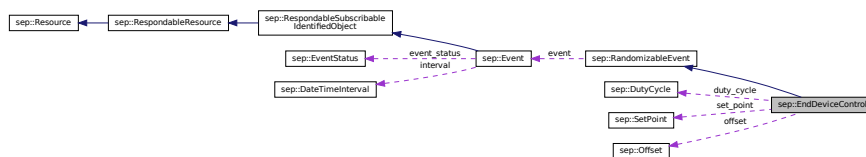
## 14.105 sep::EndDeviceControl Struct Reference

```
#include <end_device_control.hpp>
```

Inheritance diagram for sep::EndDeviceControl:



Collaboration diagram for sep::EndDeviceControl:



### Public Attributes

- ApplianceLoadReductionType **appliance\_load\_reduction**
- DeviceCategoryType **device\_category**
- bool **dr\_program\_mandatory**
- bool **load\_shift\_forward**
- DutyCycle **duty\_cycle**
- Offset **offset**
- UInt16 **override\_duration**
- SetPoint **set\_point**

### 14.105.1 Detailed Description

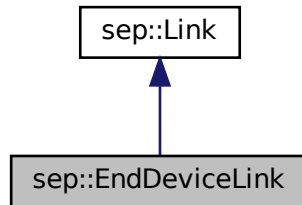
Instructs an [EndDevice](#) to perform a specified action.

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

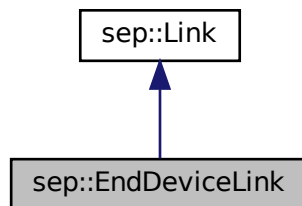
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/end\_device\_control.hpp

## 14.106 sep::EndDeviceLink Struct Reference

Inheritance diagram for sep::EndDeviceLink:



Collaboration diagram for sep::EndDeviceLink:



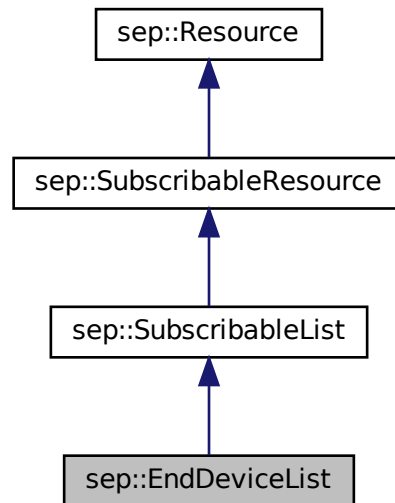
### Additional Inherited Members

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

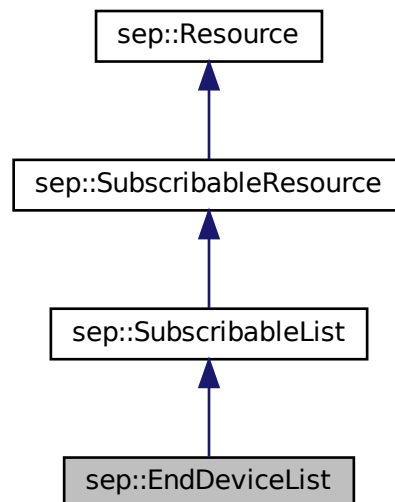
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/end\_device.hpp

## 14.107 sep::EndDeviceList Struct Reference

Inheritance diagram for sep::EndDeviceList:



Collaboration diagram for sep::EndDeviceList:



## Public Attributes

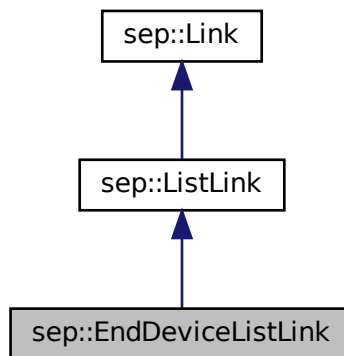
- `std::vector< EndDevice > end_devices`
- `UInt32 poll_rate`

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

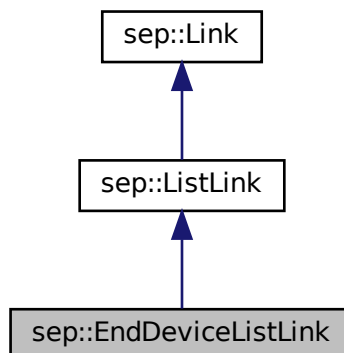
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/end_device.hpp`

## 14.108 sep::EndDeviceListLink Struct Reference

Inheritance diagram for `sep::EndDeviceListLink`:



Collaboration diagram for `sep::EndDeviceListLink`:



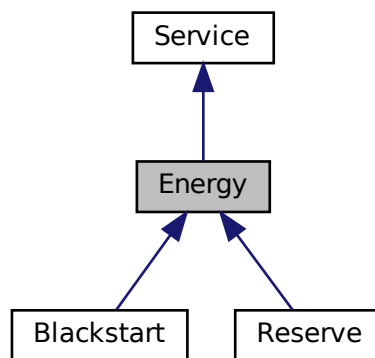
## Additional Inherited Members

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

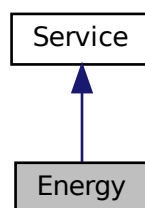
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/end\_device.hpp

## 14.109 Energy Struct Reference

Inheritance diagram for Energy:



Collaboration diagram for Energy:



## Public Attributes

- float **power**
- float **price**
- float **ramp**

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

- /home/tylor/dev/dae-egot-system/apps/simple/src/main.cpp

## 14.110 sep::EnvironmentalCost Struct Reference

```
#include <environmental_cost.hpp>
```

### Public Types

- enum class **CostKindType** : UInt8 { **CARBON\_DIOXIDE** , **SULFUR\_DIOXIDE** , **NITROGEN\_OXIDES** , **RENEWABLE\_GENERRATION** }

### Public Attributes

- UInt32 **amount**
- CostKindType **cost\_kind**
- UInt8 **cost\_level**
- UInt8 **num\_cost\_levels**

#### 14.110.1 Detailed Description

Provides alternative or secondary price information for the relevant [RateComponent](#). Supports jurisdictions that seek to convey the environmental price per unit of the specified commodity not expressed in currency. Implementers and consumers can use this attribute to prioritize operations of their HAN devices (e.g., PEV charging during times of high availability of renewable electricity resources).

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/environmental\_cost.hpp

## 14.111 ecs::simulator::waterheater::Event Struct Reference

### Public Attributes

- int64\_t **start\_time**
- int64\_t **end\_time**
- float **gallons\_per\_second**

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

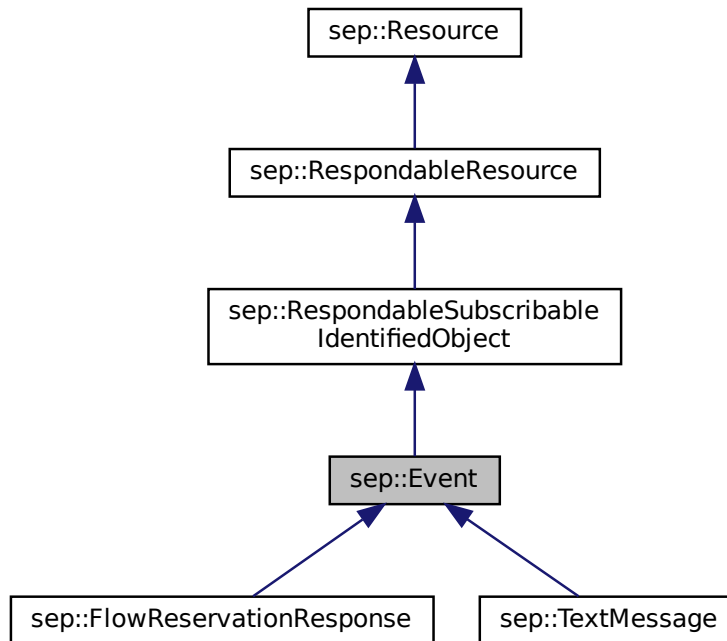
- /home/tylor/dev/dae-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp



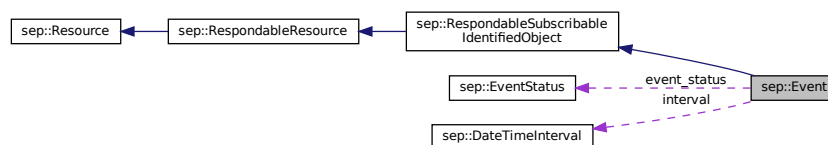
## 14.112 sep::Event Struct Reference

```
#include <event.hpp>
```

Inheritance diagram for sep::Event:



Collaboration diagram for sep::Event:



### Public Attributes

- TimeType `creation_time`
- [EventStatus](#) `event_status`
- [DateTimeInterval](#) `interval`

## Additional Inherited Members

### 14.112.1 Detailed Description

An [Event](#) indicates information that applies to a particular period of time. Events SHALL be executed relative to the time of the server, as described in the [Time](#) function set section 11.1.

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/event.hpp

## 14.113 sep::EventStatus Struct Reference

```
#include <event_status.hpp>
```

### Public Types

- enum class **CurrentStatus** : UInt8 {  
    **kScheduled** , **kActive** , **kCancelled** , **kCancelledWithRandomization** ,  
    **kSuperseded** }

### Public Attributes

- CurrentStatus **current\_status**
- TimeType **date\_time**
- bool **potentially\_superseded**
- boost::optional< TimeType > **potentially\_superseded\_time**
- boost::optional< String192 > **reason**

### 14.113.1 Detailed Description

Current status information relevant to a specific object. The Status object is used to indicate the current status of an [Event](#). Devices can read the containing resource (e.g. [TextMessage](#)) to get the most up to date status of the event. Devices can also subscribe to a specific resource instance to get updates when any of its attributes change, including the Status object.

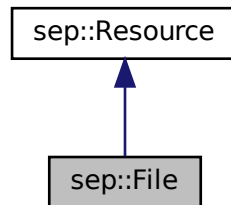
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/event\_status.hpp

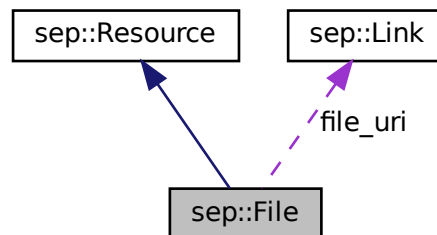
## 14.114 sep::File Struct Reference

```
#include <file.hpp>
```

Inheritance diagram for sep::File:



Collaboration diagram for sep::File:



### Public Types

- enum class **Type** : HexBinary16 { **SOFTWARE\_IMAGE** = 0x00 , **SECURITY\_CREDENTIAL** = 0x01 , **CONFIGURATION** = 0x02 , **LOG** = 0x03 }

### Public Attributes

- TimeType **activate\_time**
- Link **file\_uri**
- HexBinary160 **lfdi**
- String32 **mf\_hw\_ver**
- PENType **mf\_id**
- String32 **mf\_model**
- String32 **mf\_ser\_num**
- String16 **mf\_ver**
- UInt32 **size**
- Type **type**

### 14.114.1 Detailed Description

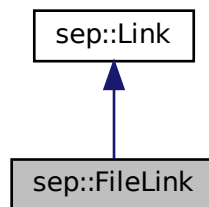
This resource contains various meta-data describing a file's characteristics. The meta-data provides general file information and also is used to support filtered queries of file lists

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

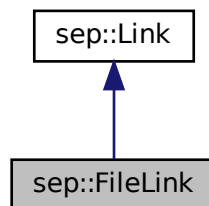
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/file.hpp

## 14.115 sep::FileLink Struct Reference

Inheritance diagram for sep::FileLink:



Collaboration diagram for sep::FileLink:



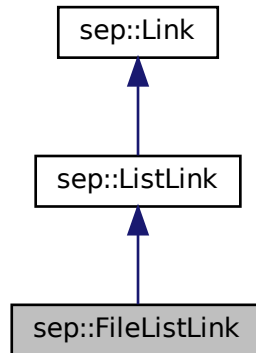
### Additional Inherited Members

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

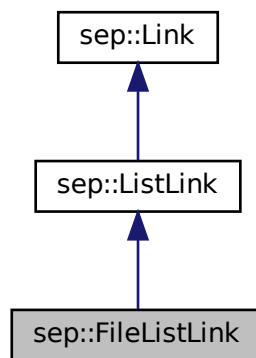
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/file.hpp

## 14.116 sep::FileListLink Struct Reference

Inheritance diagram for sep::FileListLink:



Collaboration diagram for sep::FileListLink:



### Additional Inherited Members

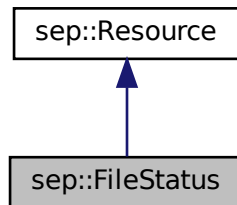
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/file.hpp`

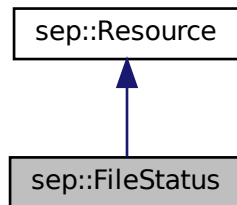
## 14.117 sep::FileStatus Struct Reference

```
#include <file_status.hpp>
```

Inheritance diagram for sep::FileStatus:



Collaboration diagram for sep::FileStatus:



### Additional Inherited Members

#### 14.117.1 Detailed Description

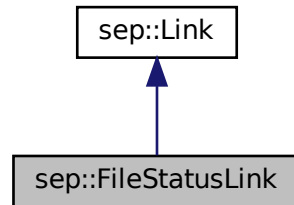
This object provides status of device file load and activation operations.

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

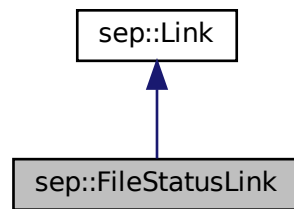
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/file\_status.hpp

## 14.118 sep::FileStatusLink Struct Reference

Inheritance diagram for sep::FileStatusLink:



Collaboration diagram for sep::FileStatusLink:



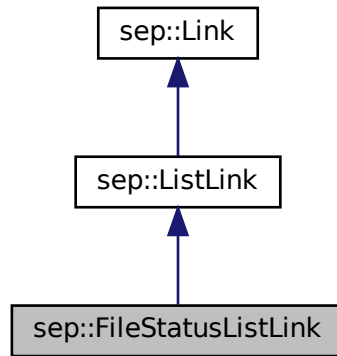
### Additional Inherited Members

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

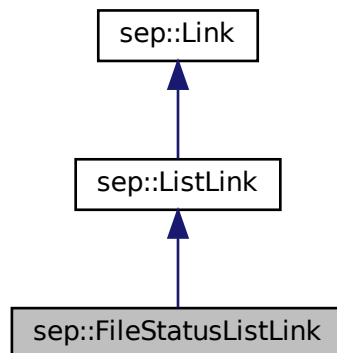
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/file\_status.hpp

## 14.119 sep::FileStatusListLink Struct Reference

Inheritance diagram for sep::FileStatusListLink:



Collaboration diagram for sep::FileStatusListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/file\_status.hpp

## 14.120 sep::FixedVAR Struct Reference

```
#include <fixed_var.hpp>
```



## Public Attributes

- sep::DERUnitRefType **ref\_type**
- sep::SignedPerCent **value**

### 14.120.1 Detailed Description

Specifies a signed setpoint for reactive power.

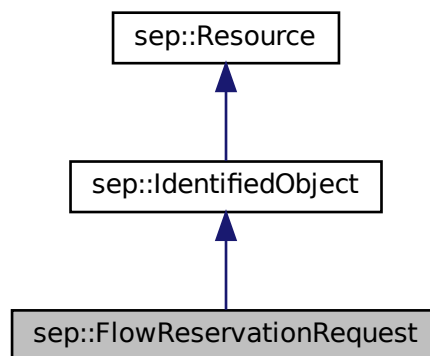
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/fixed\_var.hpp

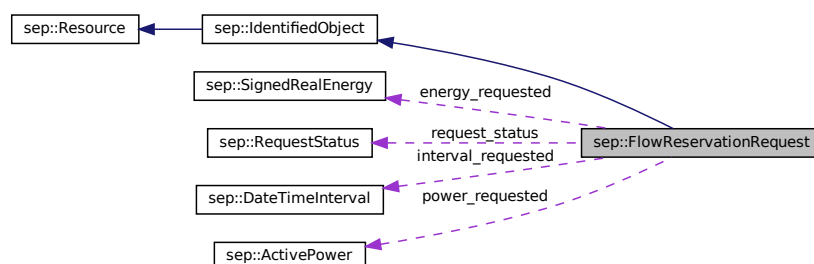
## 14.121 sep::FlowReservationRequest Struct Reference

```
#include <flow_reservation_request.hpp>
```

Inheritance diagram for sep::FlowReservationRequest:



Collaboration diagram for sep::FlowReservationRequest:



## Public Attributes

- TimeType **creation\_time**
- SignedRealEnergy **energy\_requested**
- DateTimeInterval **interval\_requested**
- ActivePower **power\_requested**
- RequestStatus **request\_status**
- boost::optional< UInt16 > **duration\_requested**

### 14.121.1 Detailed Description

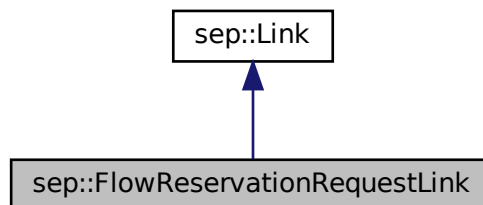
Used to request flow transactions. Client EndDevices submit a request for charging or discharging from the server. The server creates an associated [FlowReservationResponse](#) containing the charging parameters and interval to provide a lower aggregated demand at the premises, or within a larger part of the distribution system

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

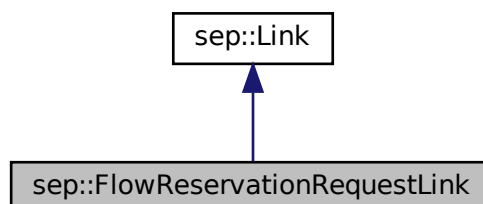
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/flow\_reservation\_request.hpp

## 14.122 sep::FlowReservationRequestLink Struct Reference

Inheritance diagram for sep::FlowReservationRequestLink:



Collaboration diagram for sep::FlowReservationRequestLink:



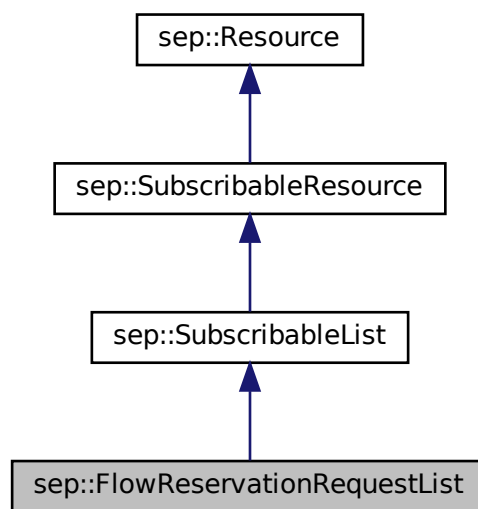
## Additional Inherited Members

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

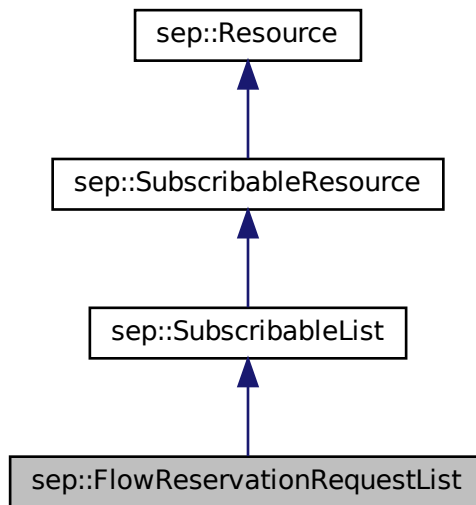
- /home/taylor/dev/dae-egot-system/libs/sep/models/include/sep/models/flow\_reservation\_request.hpp

### 14.123 sep::FlowReservationRequestList Struct Reference

Inheritance diagram for sep::FlowReservationRequestList:



Collaboration diagram for sep::FlowReservationRequestList:



### Public Attributes

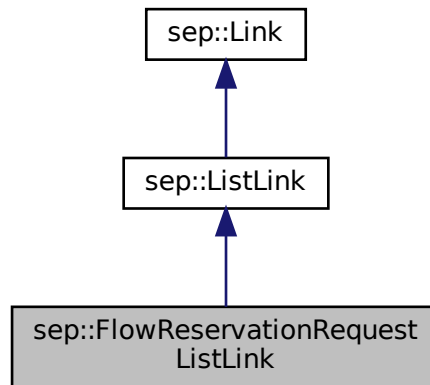
- `std::vector< FlowReservationRequest > flow_reservation_requests`
- `UInt32 poll_rate`

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

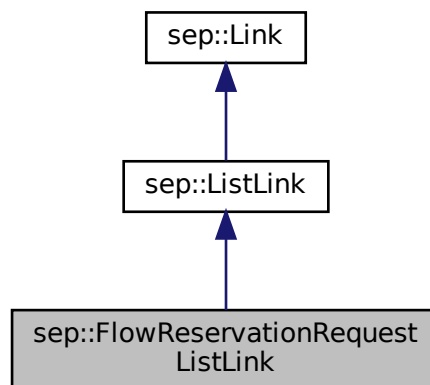
- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/flow_reservation_request.hpp`

## 14.124 sep::FlowReservationRequestListLink Struct Reference

Inheritance diagram for sep::FlowReservationRequestListLink:



Collaboration diagram for sep::FlowReservationRequestListLink:



### Additional Inherited Members

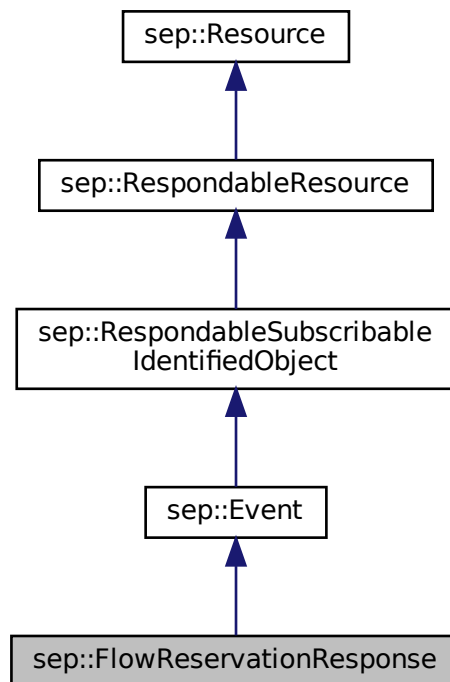
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/flow_reservation_request.hpp`

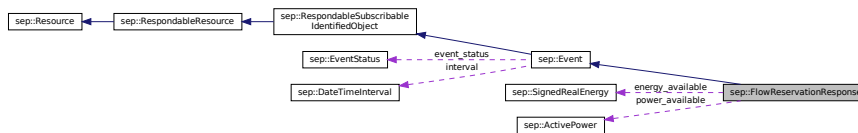
## 14.125 sep::FlowReservationResponse Struct Reference

```
#include <flow_reservation_response.hpp>
```

Inheritance diagram for sep::FlowReservationResponse:



Collaboration diagram for sep::FlowReservationResponse:



### Public Attributes

- [SignedRealEnergy](#) `energy_available`
- [ActivePower](#) `power_available`
- `mRIDType` `subject`

## Additional Inherited Members

### 14.125.1 Detailed Description

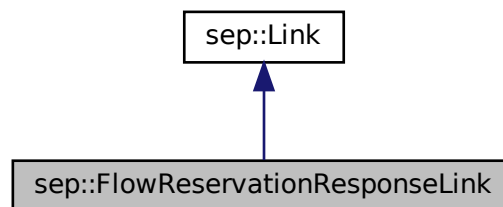
The server may modify the charging or discharging parameters and interval to provide a lower aggregated demand at the premises, or within a larger part of the distribution system.

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

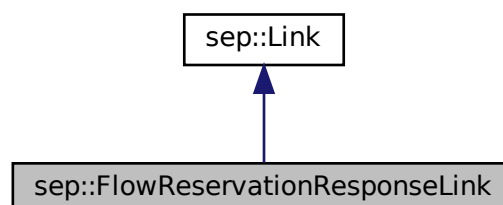
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/flow\_reservation\_response.hpp

## 14.126 sep::FlowReservationResponseLink Struct Reference

Inheritance diagram for sep::FlowReservationResponseLink:



Collaboration diagram for sep::FlowReservationResponseLink:



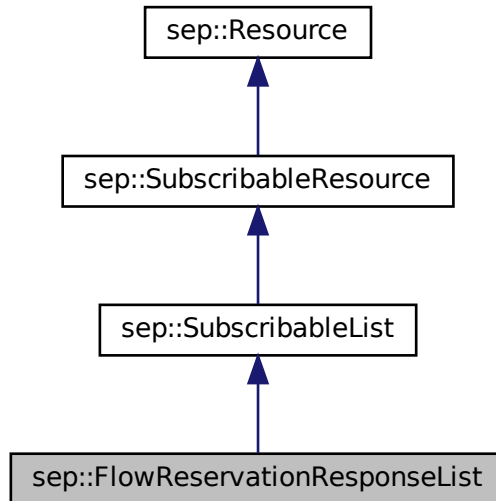
## Additional Inherited Members

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

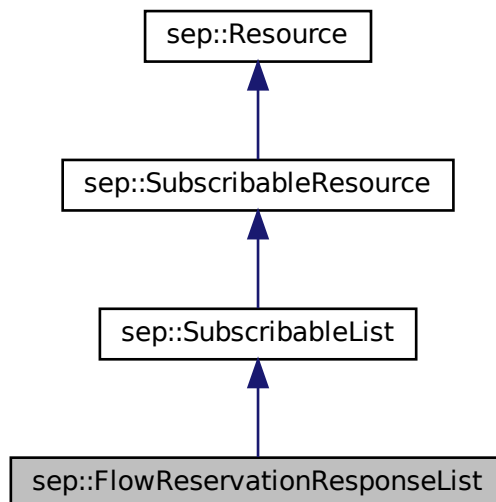
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/flow\_reservation\_response.hpp

## 14.127 sep::FlowReservationResponseList Struct Reference

Inheritance diagram for sep::FlowReservationResponseList:



Collaboration diagram for sep::FlowReservationResponseList:





## Public Attributes

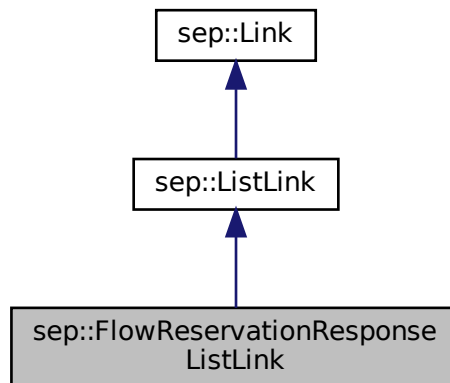
- `std::vector< FlowReservationResponse > flow_reservation_responses`
- `UInt32 poll_rate`

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

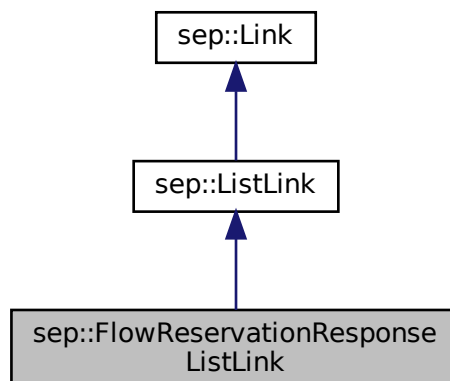
- `/home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/flow_reservation_response.hpp`

## 14.128 sep::FlowReservationResponseListLink Struct Reference

Inheritance diagram for `sep::FlowReservationResponseListLink`:



Collaboration diagram for `sep::FlowReservationResponseListLink`:



## Additional Inherited Members

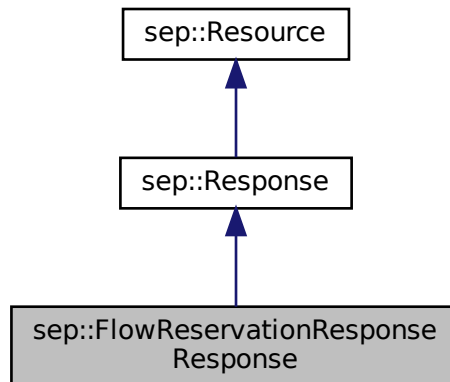
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/flow\_reservation\_response.hpp

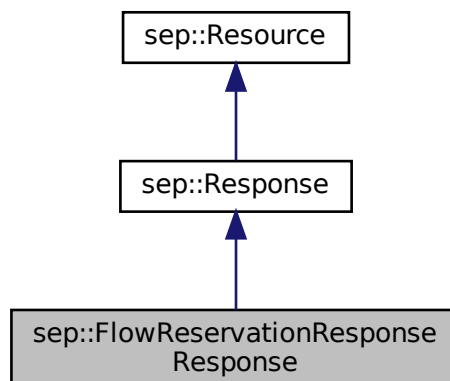
## 14.129 sep::FlowReservationResponseResponse Struct Reference

```
#include <flow_reservation_response_response.hpp>
```

Inheritance diagram for sep::FlowReservationResponseResponse:



Collaboration diagram for sep::FlowReservationResponseResponse:



## Additional Inherited Members

### 14.129.1 Detailed Description

A response to a [FlowReservationResponse](#)

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

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/flow_reservation_response_response.hpp`

### 14.130 Forecast Struct Reference

#### Public Attributes

- double **power**

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

- `/home/tylor/dev/does-egot-system/apps/simple/src/main.cpp`

### 14.131 sep::FreqDroopType Struct Reference

```
#include <freq_droop_type.hpp>
```

#### Public Attributes

- UInt32 **dbof**
- UInt32 **dbuf**
- UInt16 **kof**
- UInt16 **kuf**
- UInt16 **open\_loop\_tms**

#### 14.131.1 Detailed Description

Type for Frequency-Droop (Frequency-Watt) operation.

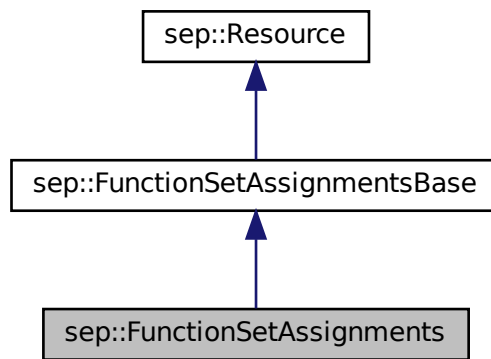
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/freq_droop_type.hpp`

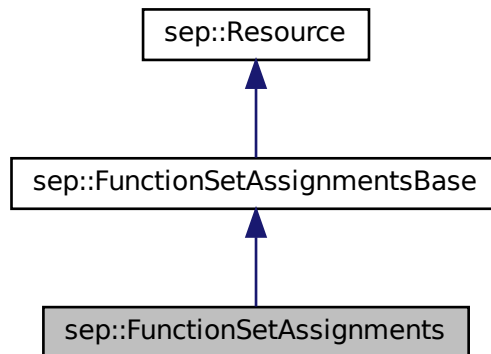
## 14.132 sep::FunctionSetAssignments Struct Reference

```
#include <function_set_assignments.hpp>
```

Inheritance diagram for sep::FunctionSetAssignments:



Collaboration diagram for sep::FunctionSetAssignments:



### Public Attributes

- mRIDType **mrid**
- String32 **description**
- VersionType **version**
- SubscribableType **subscribable**

### 14.132.1 Detailed Description

Provides an identifiable, subscribable collection of resources for a particular device to consume.

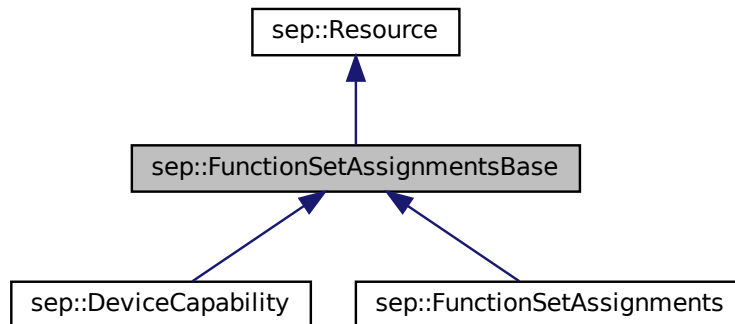
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/function\_set\_assignments.hpp

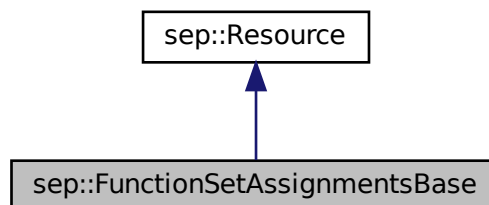
### 14.133 sep::FunctionSetAssignmentsBase Struct Reference

```
#include <function_set_assignments_base.hpp>
```

Inheritance diagram for sep::FunctionSetAssignmentsBase:



Collaboration diagram for sep::FunctionSetAssignmentsBase:



## Public Attributes

- boost::optional< [CustomerAccountListLink](#) > **customer\_account\_list\_link**
- boost::optional< [DemandResponseProgramListLink](#) > **demand\_response\_program\_list\_link**
- boost::optional< [DERProgramListLink](#) > **der\_program\_list\_link**
- boost::optional< [FileListLink](#) > **file\_list\_link**
- boost::optional< [MessagingProgramListLink](#) > **messaging\_program\_list\_link**
- boost::optional< [PrepaymentListLink](#) > **prepayment\_list\_link**
- boost::optional< [ResponseSetListLink](#) > **response\_set\_list\_link**
- boost::optional< [TariffProfileListLink](#) > **tariff\_profile\_list\_link**
- boost::optional< [TimeLink](#) > **time\_link**
- boost::optional< [UsagePointListLink](#) > **usage\_point\_list\_link**

### 14.133.1 Detailed Description

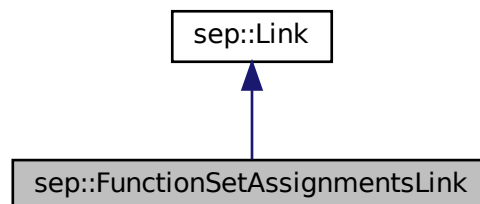
Defines a collection of function set instances that are to be used by one or more devices as indicated by the [EndDevice](#) object(s) of the server.

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

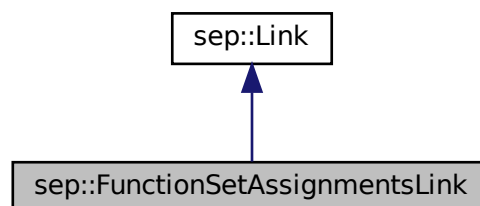
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/function\_set\_assignments\_base.hpp

## 14.134 sep::FunctionSetAssignmentsLink Struct Reference

Inheritance diagram for sep::FunctionSetAssignmentsLink:



Collaboration diagram for sep::FunctionSetAssignmentsLink:



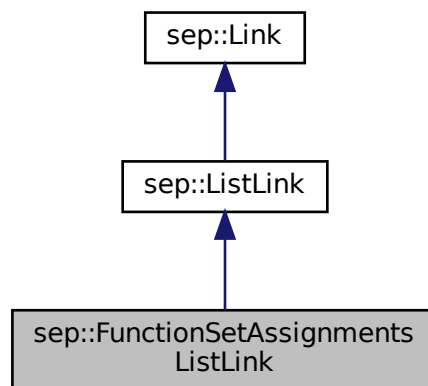
## Additional Inherited Members

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

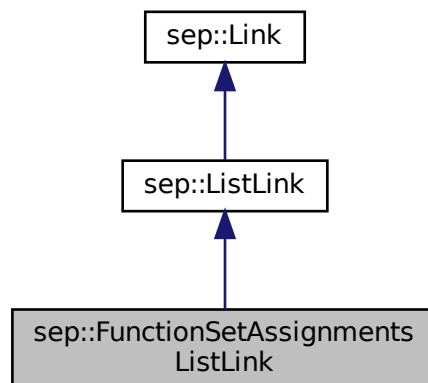
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/function\_set\_assignments.hpp

## 14.135 sep::FunctionSetAssignmentsListLink Struct Reference

Inheritance diagram for sep::FunctionSetAssignmentsListLink:



Collaboration diagram for sep::FunctionSetAssignmentsListLink:



## Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/function\_set\_assignments.hpp

## 14.136 sep::GPSLocationType Struct Reference

```
#include <gps_location_type.hpp>
```

### Public Attributes

- String32 **lat**
- String32 **lon**

### 14.136.1 Detailed Description

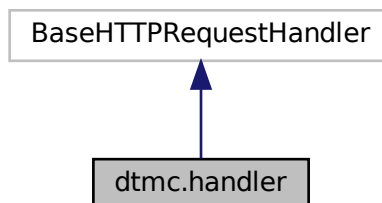
Specifies a GPS location, expressed in WGS 84 coordinates

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/gps\_location\_type.hpp

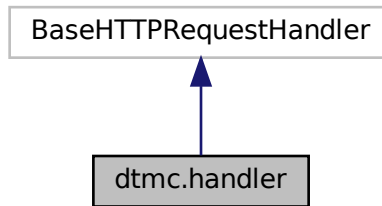
## 14.137 dtmc.handler Class Reference

Inheritance diagram for dtmc.handler:





Collaboration diagram for dtmc.handler:



### Public Member Functions

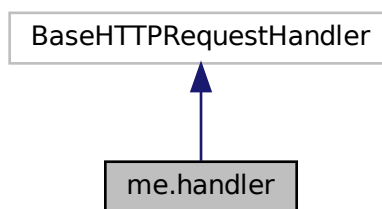
- def `do_POST` (self)

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

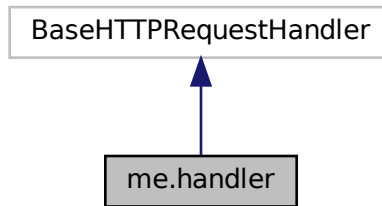
- /home/tylor/dev/does-egot-system/apps/dtm/dtmc.py

## 14.138 me.handler Class Reference

Inheritance diagram for me.handler:



Collaboration diagram for me.handler:



### Public Member Functions

- def **do\_GET** (self)
- def **do\_POST** (self)

### Public Attributes

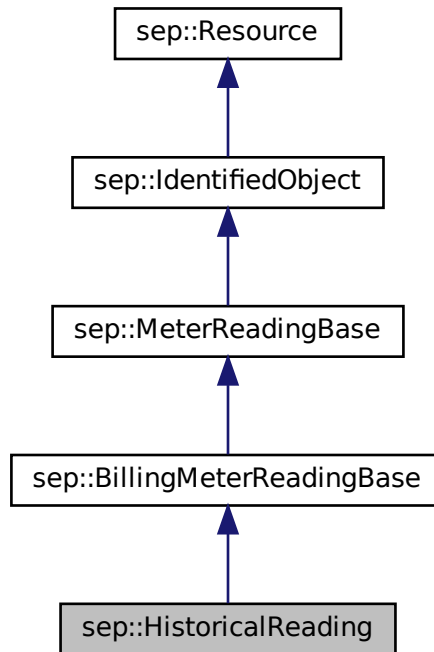
- **path**

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

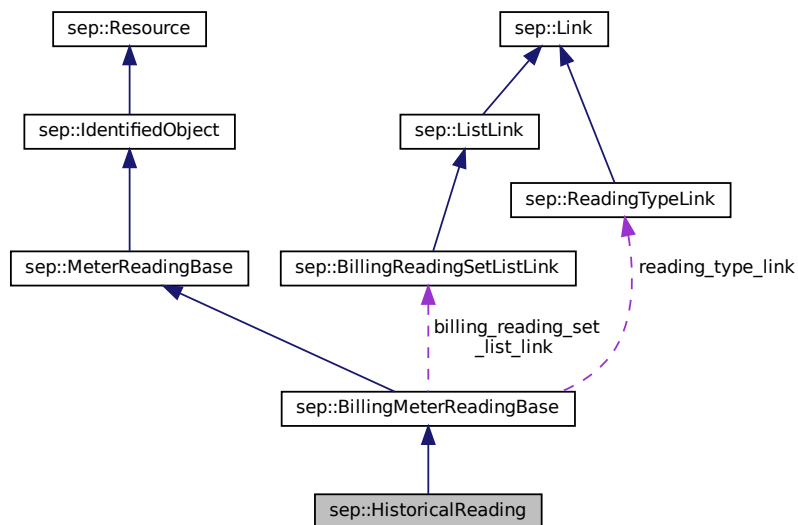
- /home/tylor/dev/does-egot-system/apps/me/me.py

## 14.139 sep::HistoricalReading Struct Reference

Inheritance diagram for sep::HistoricalReading:



Collaboration diagram for sep::HistoricalReading:



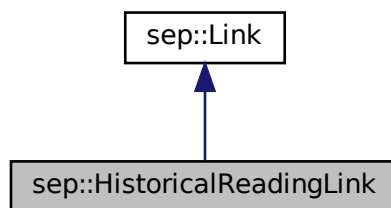
## Additional Inherited Members

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

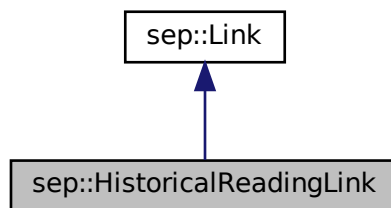
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.140 sep::HistoricalReadingLink Struct Reference

Inheritance diagram for sep::HistoricalReadingLink:



Collaboration diagram for sep::HistoricalReadingLink:



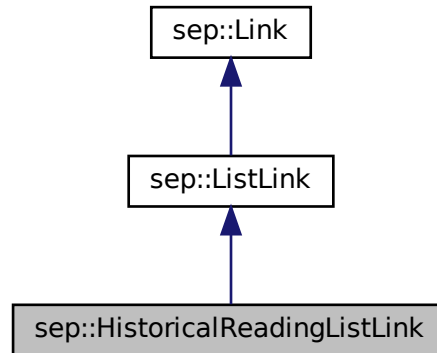
## Additional Inherited Members

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

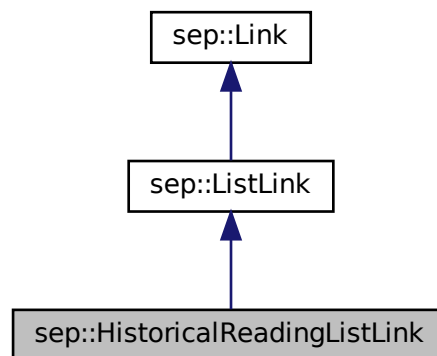
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.141 sep::HistoricalReadingListLink Struct Reference

Inheritance diagram for sep::HistoricalReadingListLink:



Collaboration diagram for sep::HistoricalReadingListLink:



### Additional Inherited Members

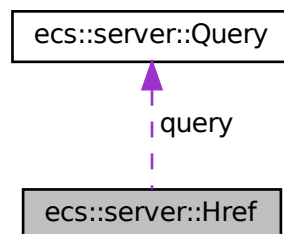
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.142 ecs::server::Href Struct Reference

```
#include <href.hpp>
```

Collaboration diagram for ecs::server::Href:



### Public Attributes

- std::string **lfdi**
- std::string **uri**
- std::string **subject**
- [Query](#) **query**

### 14.142.1 Detailed Description

Utility structure to capture parameters from client requests

#### Parameters

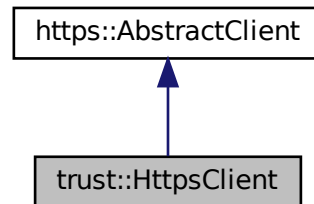
<i>lfdi</i>	is the fingerprint of the client making the request
<i>uri</i>	is the path to the resource requested
<i>subject</i>	is the base path of the uri and typically used for lists of resources that don't have a single URI
<a href="#">Query</a>	referenced above

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

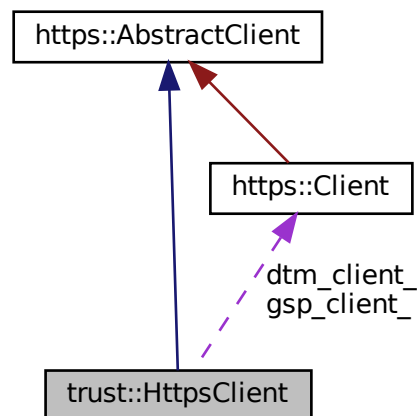
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/href.hpp

## 14.143 trust::HttpsClient Class Reference

Inheritance diagram for trust::HttpsClient:



Collaboration diagram for trust::HttpsClient:



### Public Member Functions

- **HttpsClient** ([HttpsClient](#) &other)=delete
- void **operator=** (const [HttpsClient](#) &)=delete
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Get** (const std::string &target, const std::string &query="") override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Post** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Put** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Delete** (const std::string &target) override
- sep::HexBinary160 **getLFDI** ()

## Static Public Member Functions

- static [HttpsClient](#) & [getInstance](#) (const [https::Context](#) &gsp\_ctx={"", "", "", ""}, const [https::Context](#) &dtm\_ctx={"", "", "", ""})

## Protected Attributes

- [https::Client](#) [gsp\\_client\\_](#)
- [https::Client](#) [dtm\\_client\\_](#)

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

- /home/tylor/dev/does-egot-system/libs/trust/https/include/trust/https/client.hpp
- /home/tylor/dev/does-egot-system/libs/trust/https/src/client.cpp

## 14.144 HttpsServer Class Reference

### Public Member Functions

- [HttpsServer](#) (const std::string &address, uint16\_t port, const std::string &doc\_root, int threads)

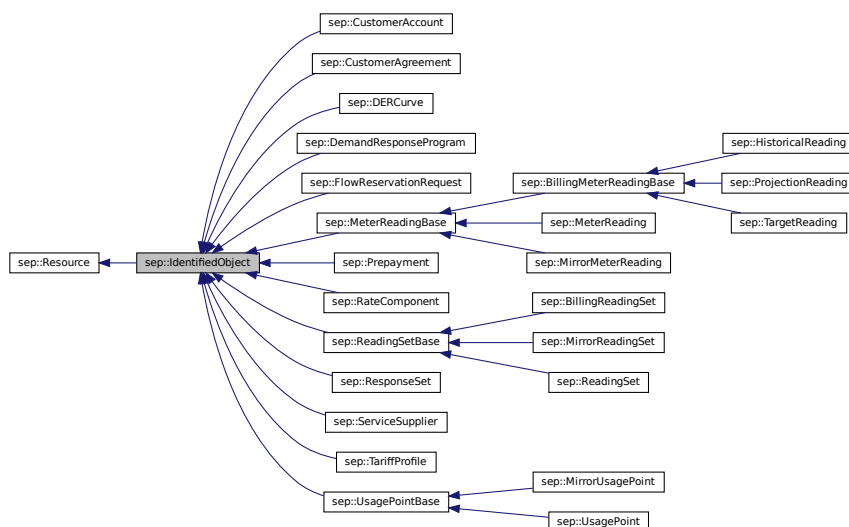
The documentation for this class was generated from the following files:

- /home/tylor/dev/does-egot-system/libs/https/server/include/https/server/server.hpp
- /home/tylor/dev/does-egot-system/libs/https/server/src/server.cpp

## 14.145 sep::IdentifiedObject Struct Reference

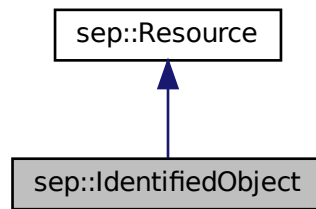
```
#include <simple_types.hpp>
```

Inheritance diagram for `sep::IdentifiedObject`:





Collaboration diagram for sep::IdentifiedObject:



## Public Attributes

- mRIDType **mrid**
- boost::optional< String32 > **description**
- boost::optional< VersionType > **version**

### 14.145.1 Detailed Description

This is a root class to provide common naming attributes for all classes needing naming attributes

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/simple\_types.hpp

## 14.146 sep::InverterStatusType Struct Reference

### Public Types

- enum class **Status** : UInt8 {  
**kNA** , **kOff** , **kSleeping** , **kStarting** ,  
**kTrackingMPPT** , **kForcedPowerReduction** , **kShuttingDown** , **kFault** ,  
**kStandby** , **kTestMode** , **kManufacturerStatus** }

### Public Attributes

- TimeType **date\_time**
- Status **value**

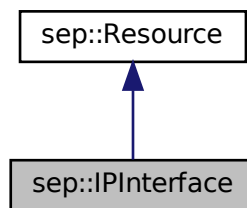
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/inverter\_status\_type.hpp

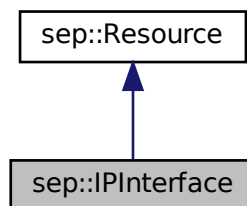
## 14.147 sep::IPInterface Struct Reference

```
#include <ip_interface.hpp>
```

Inheritance diagram for sep::IPInterface:



Collaboration diagram for sep::IPInterface:



### Additional Inherited Members

#### 14.147.1 Detailed Description

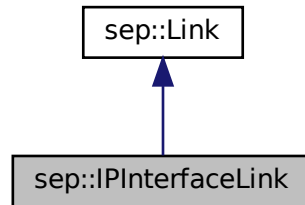
Specific [IPInterface](#) resource. This resource may be thought of as network status information for a specific network (IP) layer interface.

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

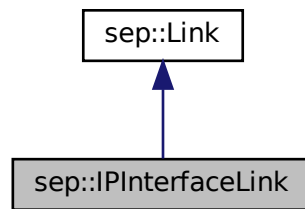
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/ip\_interface.hpp

## 14.148 sep::IPInterfaceLink Struct Reference

Inheritance diagram for sep::IPInterfaceLink:



Collaboration diagram for sep::IPInterfaceLink:



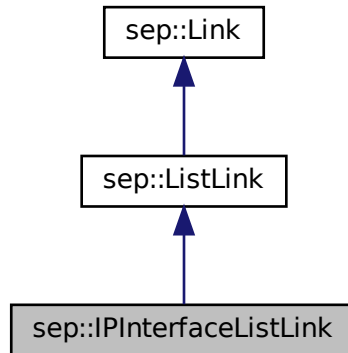
### Additional Inherited Members

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

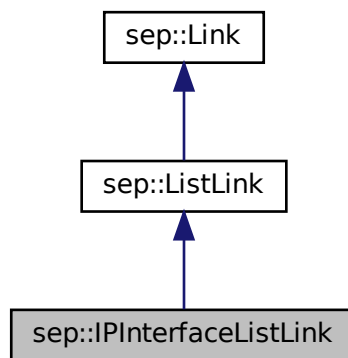
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/ip\_interface.hpp

## 14.149 sep::IPInterfaceListLink Struct Reference

Inheritance diagram for sep::IPInterfaceListLink:



Collaboration diagram for sep::IPInterfaceListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/ip\_interface.hpp

## 14.150 sep::Link Struct Reference

```
#include <simple_types.hpp>
```

Inherited by [sep::ActiveDERControlLink](#), [sep::ActiveProjectionReadingLink](#), [sep::ActiveTargetReadingLink](#), [sep::ActiveTextMessageLink](#), [sep::ActiveTimeTariffIntervalLink](#), [sep::AssociatedDERProgramLink](#), [sep::AssociatedUsagePointLink](#), [sep::BillingPeriodLink](#), [sep::BillingReadingLink](#), [sep::BillingReadingSetLink](#), [sep::ConfigurationLink](#), [sep::ConsumptionTariffIntervalLink](#), [sep::CurrentDERProgramLink](#), [sep::CustomerAccountLink](#), [sep::CustomerAgreementLink](#), [sep::DERAvailabilityLink](#), [sep::DERCapabilityLink](#), [sep::DERControlLink](#), [sep::DERCurveLink](#), [sep::DERProgramLink](#), [sep::DERSettingsLink](#), [sep::DERStatusLink](#), [sep::DefaultDERControlLink](#), [sep::DemandResponseProgramLink](#), [sep::DeviceCapabilityLink](#), [sep::DeviceInformationLink](#), [sep::DeviceStatusLink](#), [sep::EndDeviceLink](#), [sep::FileLink](#), [sep::FileStatusLink](#), [sep::FlowReservationRequestLink](#), [sep::FlowReservationResponseLink](#), [sep::FunctionSetAssignmentsLink](#), [sep::HistoricalReadingLink](#), [sep::IPInterfaceLink](#), [sep::ListLink](#), [sep::LoadShedAvailabilityLink](#), [sep::LogEventLink](#), [sep::MessagingProgramLink](#), [sep::MeterReadingLink](#), [sep::MirrorUsagePointLink](#), [sep::NotificationLink](#), [sep::PowerStatusLink](#), [sep::PrepaymentLink](#), [sep::PriceResponseCfgLink](#), [sep::ProjectionReadingLink](#), [sep::RateComponentLink](#), [sep::ReadingLink](#), [sep::ReadingSetLink](#), [sep::ReadingTypeLink](#), [sep::RegistrationLink](#), [sep::ReponseSetLink](#), [sep::ResponseLink](#), [sep::SelfDeviceLink](#), [sep::ServiceSupplierLink](#), [sep::SubscriptionLink](#), [sep::TargetReadingLink](#), [sep::TariffProfileLink](#), [sep::TextMessageLink](#), [sep::TimeLink](#), [sep::TimeTariffIntervalLink](#), and [sep::UsagePointLink](#).

### Public Attributes

- `std::string href`

#### 14.150.1 Detailed Description

Links provide a reference, via URI, to another resource.

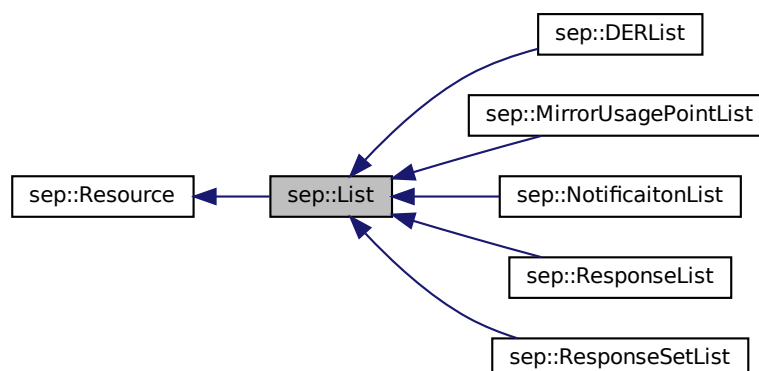
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/simple_types.hpp`

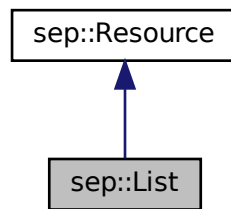
## 14.151 sep::List Struct Reference

```
#include <simple_types.hpp>
```

Inheritance diagram for `sep::List`:



Collaboration diagram for sep::List:



### Public Attributes

- UInt32 **all**
- UInt32 **results**

#### 14.151.1 Detailed Description

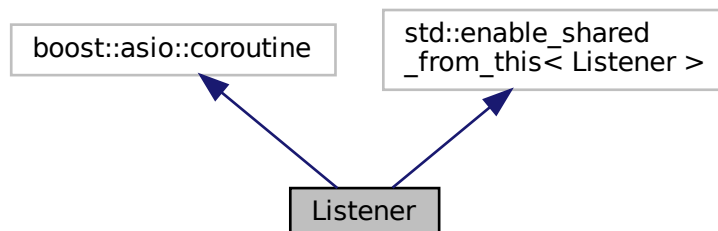
Container to hold a collection of object instances or references. See Design Pattern section for additional details.

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

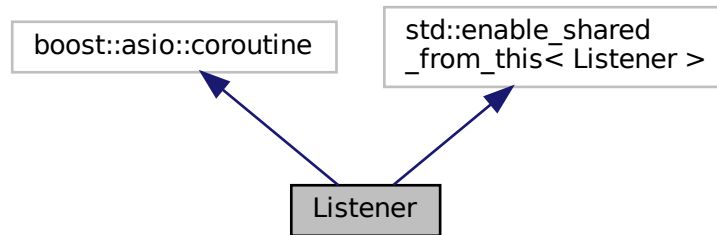
- /home/taylor/dev/doe-egot-system/libs/sep/models/include/sep/models/simple\_types.hpp

## 14.152 Listener Class Reference

Inheritance diagram for Listener:



Collaboration diagram for Listener:



## Public Member Functions

- **Listener** (boost::asio::io\_context &ioc, boost::asio::ssl::context &ctx, boost::asio::ip::tcp::endpoint endpoint, std::shared\_ptr< std::string const > const &doc\_root)
- void **run** ()

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

- /home/tylor/dev/does-egot-system/libs/https/server/include/https/server/listener.hpp

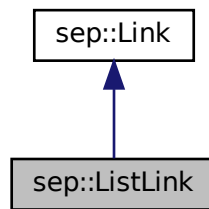
## 14.153 sep::ListLink Struct Reference

```
#include <simple_types.hpp>
```

Inherits [sep::Link](#).

Inherited by [sep::ActiveBillingPeriodListLink](#), [sep::ActiveDERControlListLink](#), [sep::ActiveProjectionReadingListLink](#), [sep::ActiveTargetReadingListLink](#), [sep::ActiveTextMessageListLink](#), [sep::ActiveTimeTariffIntervallListLink](#), [sep::AssociatedDERProgramListLink](#), [sep::BillingPeriodListLink](#), [sep::BillingReadingListLink](#), [sep::BillingReadingSetListLink](#), [sep::ConsumptionTariffIntervallListLink](#), [sep::CustomerAccountListLink](#), [sep::CustomerAgreementListLink](#), [sep::DERControlListLink](#), [sep::DERCurveListLink](#), [sep::DERListLink](#), [sep::DERProgramListLink](#), [sep::DefaultDERControlListLink](#), [sep::DemandResponseProgramListLink](#), [sep::DeviceInformationListLink](#), [sep::DeviceStatusListLink](#), [sep::EndDeviceListLink](#), [sep::FileListLink](#), [sep::FileStatusListLink](#), [sep::FlowReservationRequestListLink](#), [sep::FlowReservationResponseListLink](#), [sep::FunctionSetAssignmentsListLink](#), [sep::HistoricalReadingListLink](#), [sep::IPInterfaceListLink](#), [sep::LoadShedAvailabilityListLink](#), [sep::LogEventListLink](#), [sep::MessagingProgramListLink](#), [sep::MeterReadingListLink](#), [sep::MirrorUsagePointListLink](#), [sep::NotificaitonListLink](#), [sep::PowerStatusListLink](#), [sep::PrepaymentListLink](#), [sep::PriceResponseCfgListLink](#), [sep::ProjectionReadingListLink](#), [sep::RateComponentListLink](#), [sep::ReadingListLink](#), [sep::ReadingSetListLink](#), [sep::RegistrationListLink](#), [sep::ResponseListLink](#), [sep::ResponseSetListLink](#), [sep::SubscriptionListLink](#), [sep::TargetReadingListLink](#), [sep::TariffProfileListLink](#), [sep::TextMessageListLink](#), [sep::TimeTariffIntervallListLink](#), and [sep::UsagePointListLink](#).

Collaboration diagram for sep::ListLink:



### Public Attributes

- UInt32 all

#### 14.153.1 Detailed Description

ListLinks provide a reference, via URI, to a [List](#).

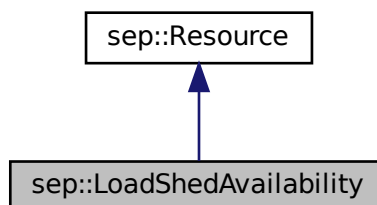
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/simple\_types.hpp

## 14.154 sep::LoadShedAvailability Struct Reference

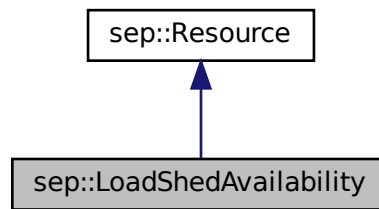
```
#include <load_shed_availability.hpp>
```

Inheritance diagram for sep::LoadShedAvailability:





Collaboration diagram for sep::LoadShedAvailability:



## Additional Inherited Members

### 14.154.1 Detailed Description

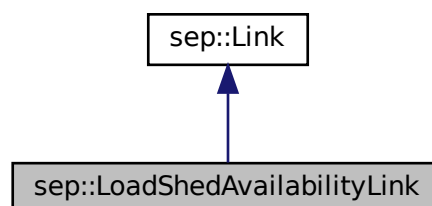
Indicates current consumption status and ability to shed load.

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

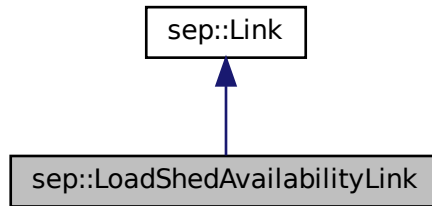
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/load\_shed\_availability.hpp

## 14.155 sep::LoadShedAvailabilityLink Struct Reference

Inheritance diagram for sep::LoadShedAvailabilityLink:



Collaboration diagram for sep::LoadShedAvailabilityLink:



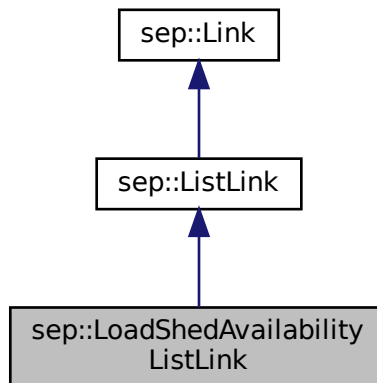
### Additional Inherited Members

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

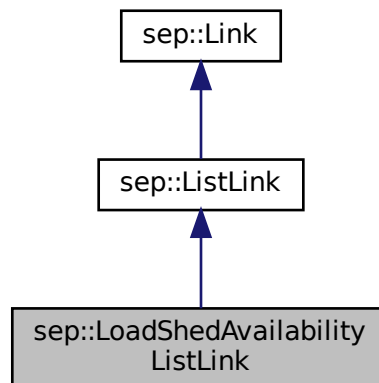
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/load\_shed\_availability.hpp

## 14.156 sep::LoadShedAvailabilityListLink Struct Reference

Inheritance diagram for sep::LoadShedAvailabilityListLink:



Collaboration diagram for sep::LoadShedAvailabilityListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/load\_shed\_availability.hpp

### 14.157 Local Struct Reference

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

- /home/tylor/dev/does-egot-system/apps/simple/src/solar.cpp

### 14.158 sep::LocalControlModeStatusType Struct Reference

#### Public Types

- enum class **ControlStatus** : UInt8 { **kLocal** , **kRemote** }

#### Public Attributes

- TimeType **date\_time**
- ControlStatus **value**

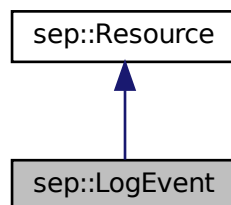
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/local\_control\_mode\_status\_type.hpp

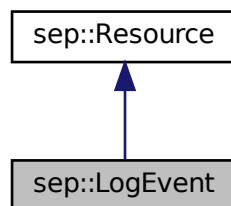
## 14.159 sep::LogEvent Struct Reference

```
#include <log_event.hpp>
```

Inheritance diagram for sep::LogEvent:



Collaboration diagram for sep::LogEvent:



### Public Types

- enum class **FunctionSet** : UInt8 {  
  **GENERAL** , **PUB\_SUB** , **END\_DEVICE** , **FSA** ,  
  **RESPONSE** , **DRLC** , **METERING** , **PRICING** ,  
  **MESSAGING** , **BILLING** , **PREPAYMENT** , **DER** ,  
  **TIME** , **SOFTWARE\_DOWNLOAD** , **DEVICE\_INFO** , **POWER\_STATUS** ,  
  **NETWORK\_STATUS** , **LOG\_EVENT\_LIST** , **CONFIGURATION** , **SECURITY** }
- enum class **ProfileID** : UInt8 {  
  **NOT\_PROFILE\_SPECIFIC** , **VENDOR\_DEFINED** , **IEEE\_2030\_5** , **HOME\_AUTOMATION** ,  
  **BUILDING\_AUTOMATION** }

## Public Attributes

- TimeType **created\_date\_time**
- String32 **details**
- UInt32 **extended\_data**
- FunctionSet **function\_set**
- UInt8 **log\_event\_code**
- UInt16 **log\_event\_id**
- PENType **log\_event\_pen**
- ProfileID **profile\_id**

### 14.159.1 Detailed Description

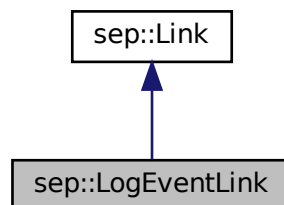
A time stamped instance of a significant event detected by the device.

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

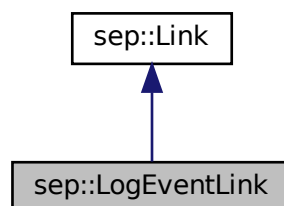
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/log\_event.hpp

### 14.160 sep::LogEventLink Struct Reference

Inheritance diagram for sep::LogEventLink:



Collaboration diagram for sep::LogEventLink:



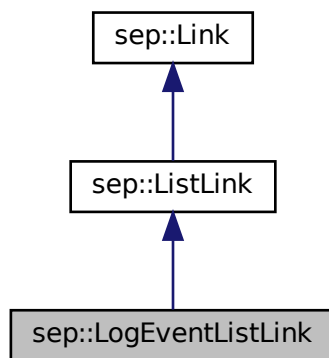
## Additional Inherited Members

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

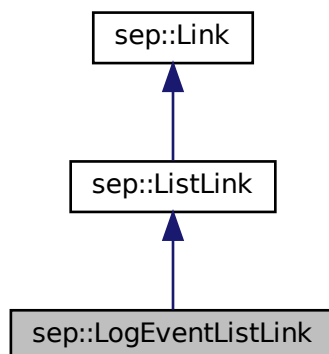
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/log\_event.hpp

## 14.161 sep::LogEventListLink Struct Reference

Inheritance diagram for sep::LogEventListLink:



Collaboration diagram for sep::LogEventListLink:



## Additional Inherited Members

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

- `/home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/log_event.hpp`

## 14.162 `sep::ManufacturerStatusType` Struct Reference

```
#include <manufacturer_status_type.hpp>
```

### Public Attributes

- TimeType `date_time`
- String6 `value`

### 14.162.1 Detailed Description

[DER](#) ManufacturerStatus/value: String data type

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

- `/home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/manufacturer_status_type.hpp`

## 14.163 `trust::Message` Struct Reference

### Public Attributes

- `std::string to`
- `std::string from`
- `uint64_t timestamp`
- `std::map< std::string, std::string > contents`

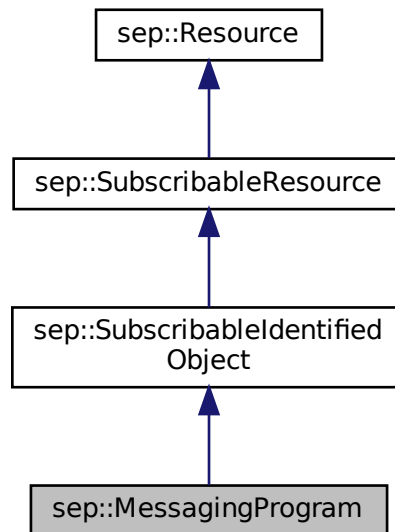
The documentation for this struct was generated from the following file:

- `/home/taylor/dev/does-egot-system/libs/trust/xml/include/trust/xml/utis.hpp`

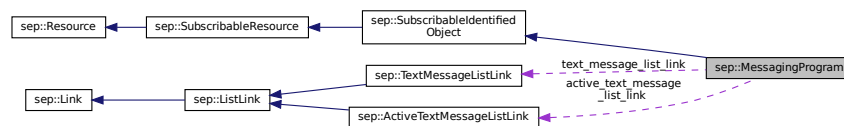
## 14.164 sep::MessagingProgram Struct Reference

```
#include <messaging_program.hpp>
```

Inheritance diagram for sep::MessagingProgram:



Collaboration diagram for sep::MessagingProgram:



### Public Attributes

- [ActiveTextMessageListLink](#) **active\_text\_message\_list\_link**
- LocaleType **locale**
- PrimacyType **primacy**
- [TextMessageListLink](#) **text\_message\_list\_link**

### 14.164.1 Detailed Description

Provides a container for collections of text messages.

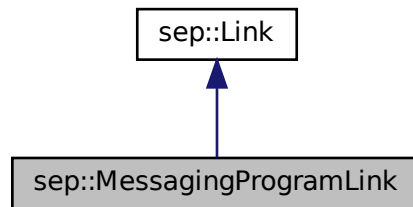
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/messaging\_program.hpp

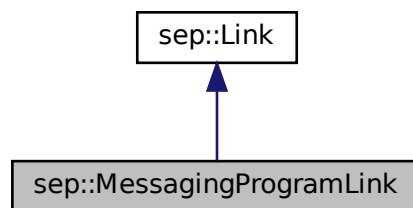


## 14.165 sep::MessagingProgramLink Struct Reference

Inheritance diagram for sep::MessagingProgramLink:



Collaboration diagram for sep::MessagingProgramLink:



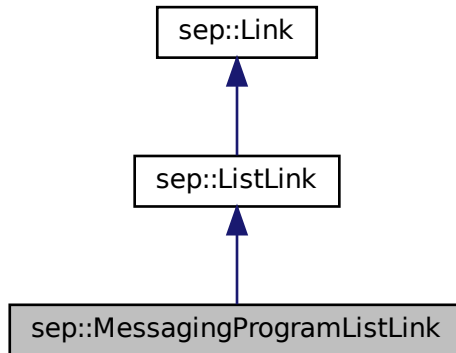
### Additional Inherited Members

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

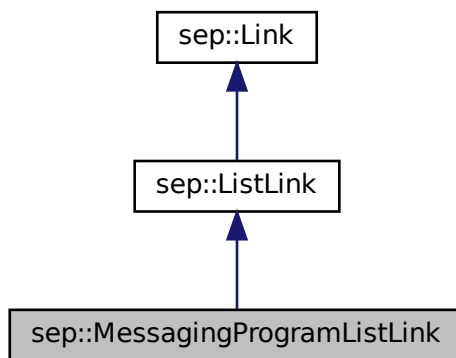
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/messaging\_program.hpp

## 14.166 sep::MessagingProgramListLink Struct Reference

Inheritance diagram for sep::MessagingProgramListLink:



Collaboration diagram for sep::MessagingProgramListLink:



### Additional Inherited Members

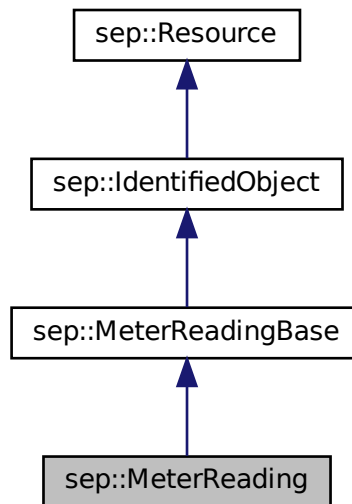
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/messaging\_program.hpp

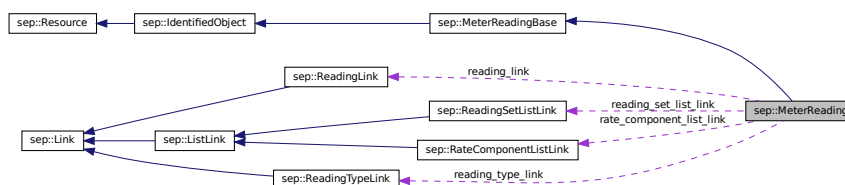
## 14.167 sep::MeterReading Struct Reference

```
#include <meter_reading_base.hpp>
```

Inheritance diagram for sep::MeterReading:



Collaboration diagram for sep::MeterReading:



### Public Attributes

- [RateComponentListLink](#) `rate_component_list_link`
- [ReadingLink](#) `reading_link`
- [ReadingSetListLink](#) `reading_set_list_link`
- [ReadingTypeLink](#) `reading_type_link`

### 14.167.1 Detailed Description

Set of values obtained from the meter.

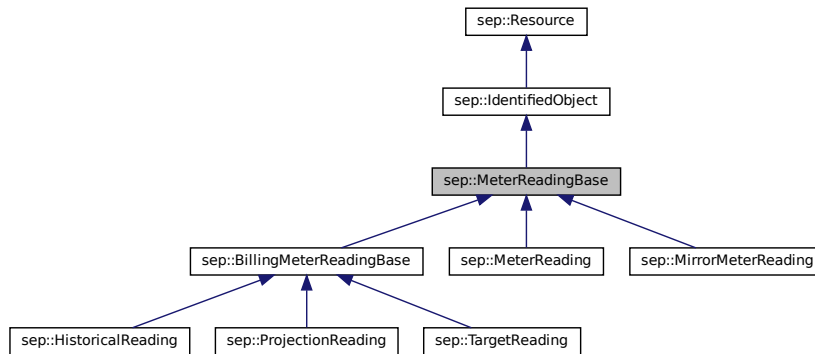
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/meter_reading_base.hpp`

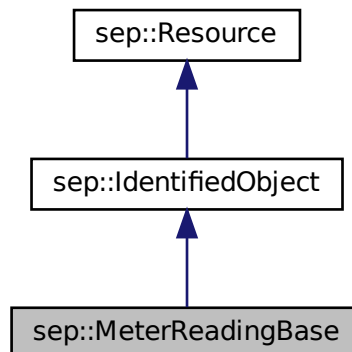
## 14.168 sep::MeterReadingBase Struct Reference

```
#include <meter_reading_base.hpp>
```

Inheritance diagram for sep::MeterReadingBase:



Collaboration diagram for sep::MeterReadingBase:



### Additional Inherited Members

#### 14.168.1 Detailed Description

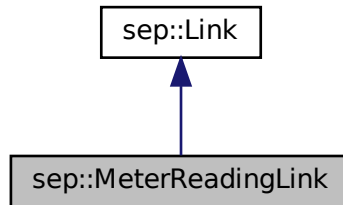
A container for associating [ReadingType](#), Readings and ReadingSets.

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

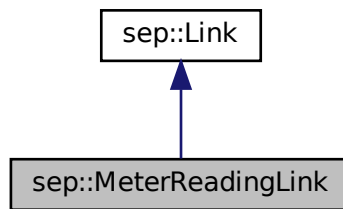
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/meter\_reading\_base.hpp

## 14.169 sep::MeterReadingLink Struct Reference

Inheritance diagram for sep::MeterReadingLink:



Collaboration diagram for sep::MeterReadingLink:



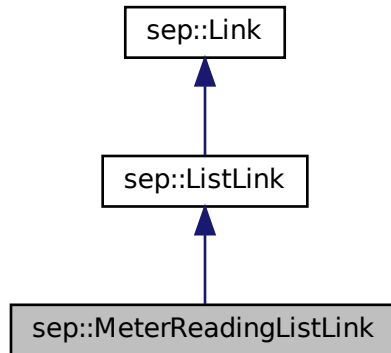
### Additional Inherited Members

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

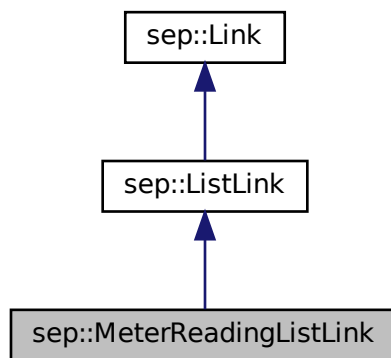
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/meter\_reading\_base.hpp

## 14.170 sep::MeterReadingListLink Struct Reference

Inheritance diagram for sep::MeterReadingListLink:



Collaboration diagram for sep::MeterReadingListLink:



### Additional Inherited Members

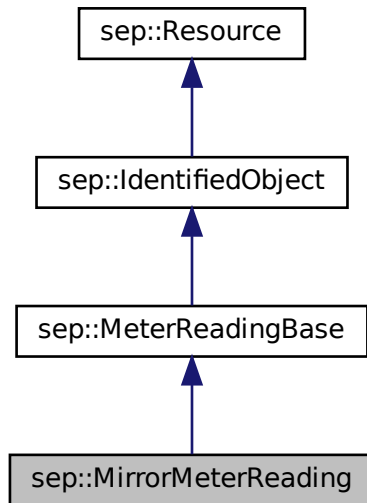
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/meter\_reading\_base.hpp

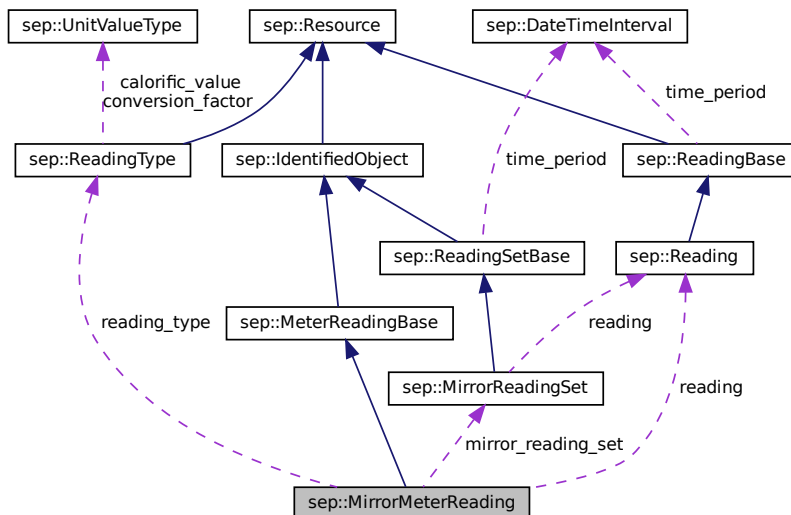
### 14.171 sep::MirrorMeterReading Struct Reference

```
#include <mirror_meter_reading.hpp>
```

Inheritance diagram for sep::MirrorMeterReading:



Collaboration diagram for sep::MirrorMeterReading:



## Public Attributes

- TimeType `last_update_time`
- [MirrorReadingSet](#) `mirror_reading_set`
- TimeType `next_update_time`
- [Reading](#) `reading`
- [ReadingType](#) `reading_type`

### 14.171.1 Detailed Description

Mimic of [MeterReading](#) used for managing mirrors.

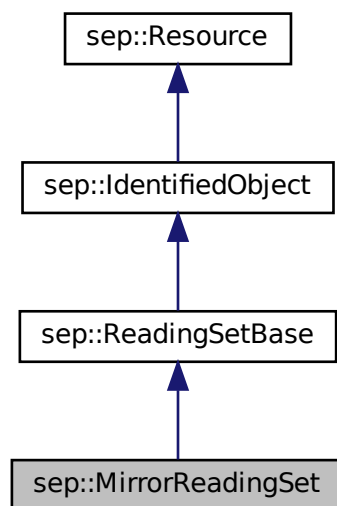
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/mirror_meter_reading.hpp`

## 14.172 sep::MirrorReadingSet Struct Reference

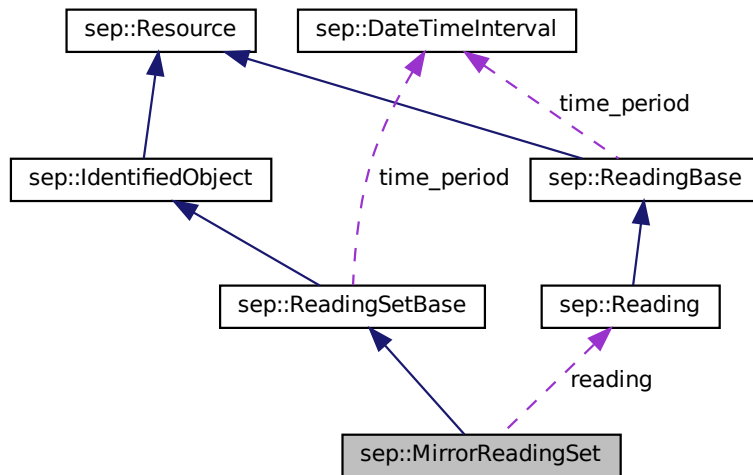
```
#include <mirror_reading_set.hpp>
```

Inheritance diagram for `sep::MirrorReadingSet`:





Collaboration diagram for sep::MirrorReadingSet:



## Public Attributes

- [Reading](#) reading

### 14.172.1 Detailed Description

A set of Readings of the [ReadingType](#) indicated by the parent [MeterReading](#).

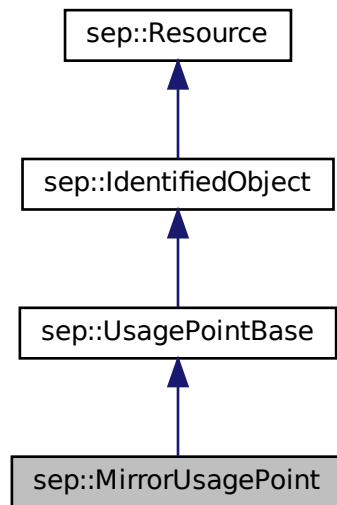
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/mirror_reading_set.hpp`

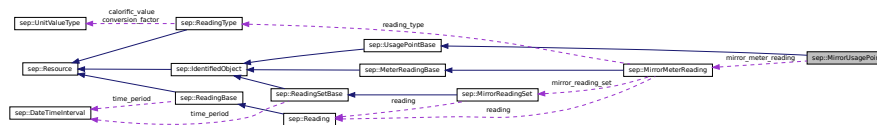
### 14.173 sep::MirrorUsagePoint Struct Reference

```
#include <mirror_usage_point.hpp>
```

Inheritance diagram for sep::MirrorUsagePoint:



Collaboration diagram for sep::MirrorUsagePoint:



## Public Attributes

- HexBinary160 **device\_ifdi**
- [MirrorMeterReading](#) **mirror\_meter\_reading**
- UInt32 **post\_rate**

## Additional Inherited Members

### 14.173.1 Detailed Description

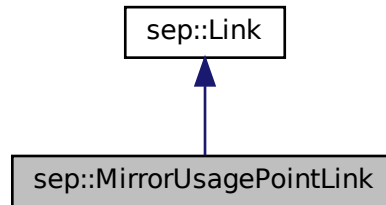
A parallel to [UsagePoint](#) to support mirroring

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

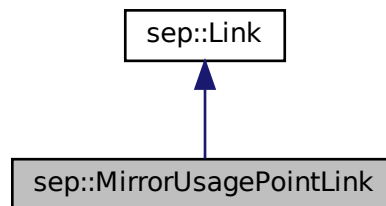
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/mirror\_usage\_point.hpp

## 14.174 sep::MirrorUsagePointLink Struct Reference

Inheritance diagram for sep::MirrorUsagePointLink:



Collaboration diagram for sep::MirrorUsagePointLink:



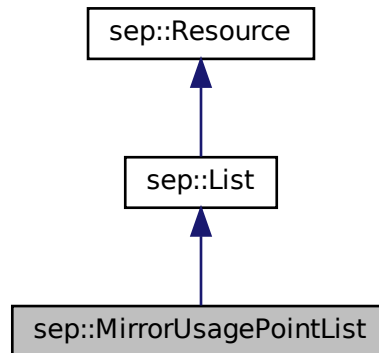
### Additional Inherited Members

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

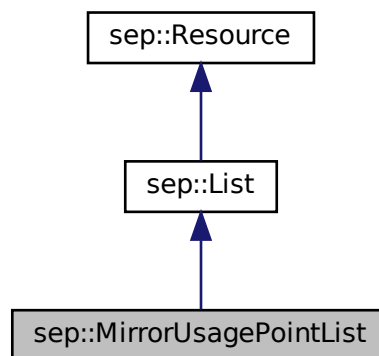
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/mirror\_usage\_point.hpp

## 14.175 sep::MirrorUsagePointList Struct Reference

Inheritance diagram for sep::MirrorUsagePointList:



Collaboration diagram for sep::MirrorUsagePointList:



### Public Attributes

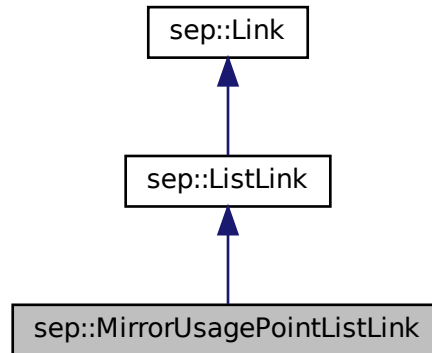
- `std::vector< MirrorUsagePoint > mirror_usage_points`
- `UInt32 poll_rate`

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

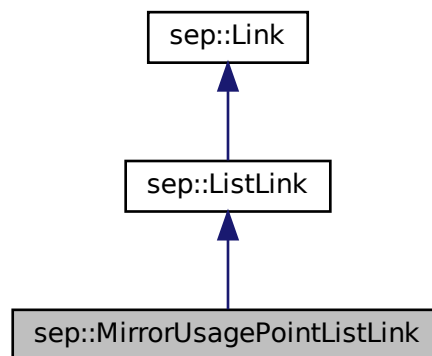
- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/mirror_usage_point.hpp`

## 14.176 sep::MirrorUsagePointListLink Struct Reference

Inheritance diagram for sep::MirrorUsagePointListLink:



Collaboration diagram for sep::MirrorUsagePointListLink:



### Additional Inherited Members

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

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/mirror_usage_point.hpp`

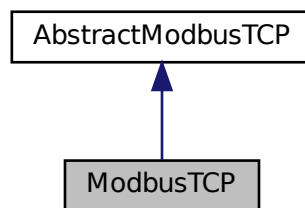
## 14.177 sunspec::ModbusAdapter Class Reference

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

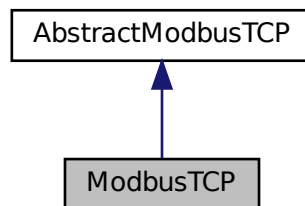
- /home/tylor/dev/dae-egot-system/libs/sunspec-modbus/include/sunspec/modbus\_adapter.hpp
- /home/tylor/dev/dae-egot-system/libs/sunspec-modbus/modbus\_adapter.cpp

## 14.178 ModbusTCP Class Reference

Inheritance diagram for ModbusTCP:



Collaboration diagram for ModbusTCP:



### Public Member Functions

- **ModbusTCP** (const char \*ip\_address, const uint16\_t port)
- void **ReadRegisters** (const uint16\_t offset, const uint16\_t length, uint16\_t \*reg\_ptr)
- void **WriteRegisters** (const uint16\_t offset, const uint16\_t length, const uint16\_t \*reg\_ptr)

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

- /home/tylor/dev/dae-egot-system/libs/modbus/include/modbus/modbus\_tcp.hpp
- /home/tylor/dev/dae-egot-system/libs/modbus/modbus\_tcp.cpp

## 14.179 ecs::client::actderc::Module Struct Reference

```
#include <actderc.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDeviceCapability](#) (flecs::entity e, [sep::DERControlLink](#) &link)
- static void [updateDeviceCapability](#) (flecs::entity e, [sep::DERControl](#) &dcap)

### 14.179.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DeviceCapability and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.179.2 Member Function Documentation

#### 14.179.2.1 [getDeviceCapability\(\)](#)

```
static void ecs::client::actderc::Module::getDeviceCapability (  
    flecs::entity e,  
    sep::DERControlLink & link ) [static]
```

request the DeviceCapability resource from an IEEE 2030.5 Server

#### 14.179.2.2 [updateDeviceCapability\(\)](#)

```
static void ecs::client::actderc::Module::updateDeviceCapability (  
    flecs::entity e,  
    sep::DERControl & dcap ) [static]
```

update the DeviceCapability resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/actderc.hpp

## 14.180 ecs::client::cdp::Module Struct Reference

```
#include <cdp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getCurrentDERProgram](#) (flecs::entity e, [sep::CurrentDERProgramLink](#) &link)
- static void [updateCurrentDERProgram](#) (flecs::entity e, [sep::DERProgram](#) &dcap)

#### 14.180.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the CurrentDERProgram and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

#### 14.180.2 Member Function Documentation

##### 14.180.2.1 [getCurrentDERProgram\(\)](#)

```
static void ecs::client::cdp::Module::getCurrentDERProgram (  
    flecs::entity e,  
    sep::CurrentDERProgramLink & link ) [static]
```

request the CurrentDERProgram resource from an IEEE 2030.5 Server

##### 14.180.2.2 [updateCurrentDERProgram\(\)](#)

```
static void ecs::client::cdp::Module::updateCurrentDERProgram (  
    flecs::entity e,  
    sep::DERProgram & dcap ) [static]
```

update the CurrentDERProgram resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/cdp.hpp



## 14.181 ecs::client::commodity::Module Struct Reference

```
#include <commodity.hpp>
```

### Public Member Functions

- **Module** (flecs::world &ecs)

### 14.181.1 Detailed Description

this module

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/cta2045/include/ecs/client/cta2045/commodity.hpp
- /home/tylor/dev/dae-egot-system/libs/ecs/client/cta2045/src/commodity.cpp

## 14.182 ecs::client::dc::Module Struct Reference

```
#include <dc.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERControl](#) (flecs::entity e, [sep::DERControl](#) &link)
- static void [getDERCurve](#) (flecs::entity e, [sep::DERCurveLink](#) &link)
- static void [updateDERControl](#) (flecs::entity e, [sep::DERControl](#) &dcap)

### 14.182.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERControl and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.182.2 Member Function Documentation

### 14.182.2.1 getDERControl()

```
static void ecs::client::dc::Module::getDERControl (
    flecs::entity e,
    sep::DERControl & link ) [static]
```

request the DERControl resource from an IEEE 2030.5 Server

### 14.182.2.2 getDERCurve()

```
static void ecs::client::dc::Module::getDERCurve (
    flecs::entity e,
    sep::DERCurveLink & link ) [static]
```

request the DERControl resource from an IEEE 2030.5 Server

### 14.182.2.3 updateDERControl()

```
static void ecs::client::dc::Module::updateDERControl (
    flecs::entity e,
    sep::DERControl & dcap ) [static]
```

update the DERControl resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/dc.hpp

## 14.183 ecs::client::dcap::Module Struct Reference

```
#include <dcap.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDeviceCapability](#) (flecs::entity e, [sep::DeviceCapabilityLink](#) &link)
- static void [updateDeviceCapability](#) (flecs::entity e, [sep::DeviceCapability](#) &dcap)
- static void [getSelfDevice](#) (flecs::entity e, [sep::SelfDeviceLink](#) &link)
- static void [getEndDevice](#) (flecs::entity e, [sep::EndDeviceListLink](#) &list\_link)
- static void [getTime](#) (flecs::entity e, [sep::TimeLink](#) &link)

### 14.183.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DeviceCapability and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.183.2 Member Function Documentation

#### 14.183.2.1 `getDeviceCapability()`

```
void Module::getDeviceCapability (
    flecs::entity e,
    sep::DeviceCapabilityLink & link ) [static]
```

request the DeviceCapability resource from an IEEE 2030.5 Server

#### 14.183.2.2 `getEndDevice()`

```
void Module::getEndDevice (
    flecs::entity e,
    sep::EndDeviceListLink & list_link ) [static]
```

request the EndDeviceList from an IEEE 2030.5 Server

#### 14.183.2.3 `getSelfDevice()`

```
void Module::getSelfDevice (
    flecs::entity e,
    sep::SelfDeviceLink & link ) [static]
```

request the SelfDevice from an IEEE 2030.5 Server

#### 14.183.2.4 `getTime()`

```
void Module::getTime (
    flecs::entity e,
    sep::TimeLink & link ) [static]
```

request the Time from an IEEE 2030.5 Server

### 14.183.2.5 updateDeviceCapability()

```
void Module::updateDeviceCapability (
    flecs::entity e,
    sep::DeviceCapability & dcap ) [static]
```

update the DeviceCapability resource and all its links

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/dcap.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/dcap.cpp

## 14.184 ecs::client::dderc::Module Struct Reference

```
#include <dderc.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDefaultDERControl](#) (flecs::entity e, [sep::DefaultDERControlLink](#) &link)
- static void [updateDefaultDERControl](#) (flecs::entity e, [sep::DERControl](#) &dderc)

### 14.184.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the CurrentDERProgram and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.184.2 Member Function Documentation

#### 14.184.2.1 getDefaultDERControl()

```
static void ecs::client::dderc::Module::getDefaultDERControl (
    flecs::entity e,
    sep::DefaultDERControlLink & link ) [static]
```

request the CurrentDERProgram resource from an IEEE 2030.5 Server

### 14.184.2.2 updateDefaultDERControl()

```
static void ecs::client::dderc::Module::updateDefaultDERControl (
    flecs::entity e,
    sep::DERControl & dderc ) [static]
```

update the CurrentDERProgram resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/dderc.hpp

## 14.185 ecs::client::der::Module Struct Reference

```
#include <der.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERCapabilities](#) (flecs::entity e, [sep::DERCapabilityLink](#) &link)
- static void [getDERSettings](#) (flecs::entity e, [sep::DERSettingsLink](#) &link)
- static void [getDERStatus](#) (flecs::entity e, [sep::DERStatusLink](#) &link)
- static void [getDERAvailability](#) (flecs::entity e, [sep::DERAvailabilityLink](#) &link)
- static void [updateDER](#) (flecs::entity e, [sep::DERList](#) &der)

### 14.185.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DER and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.185.2 Member Function Documentation

#### 14.185.2.1 getDERCapabilities()

```
void Module::getDERCapabilities (
    flecs::entity e,
    sep::DERCapabilityLink & link ) [static]
```

request the DER resource from an IEEE 2030.5 Server

### 14.185.2.2 updateDER()

```
void Module::updateDER (
    flecs::entity e,
    sep::DERList & der ) [static]
```

update the DER resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/der.hpp
- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/src/der.cpp

## 14.186 ecs::client::dera::Module Struct Reference

```
#include <dera.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERAvailability](#) (flecs::entity e, [sep::DERAvailabilityLink](#) &link)
- static void [updateDERAvailability](#) (flecs::entity e, [sep::DERAvailability](#) &dderc)

### 14.186.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERAvailability and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.186.2 Member Function Documentation

#### 14.186.2.1 getDERAvailability()

```
static void ecs::client::dera::Module::getDERAvailability (
    flecs::entity e,
    sep::DERAvailabilityLink & link ) [static]
```

request the DERAvailability resource from an IEEE 2030.5 Server

### 14.186.2.2 updateDERAvailability()

```
static void ecs::client::dera::Module::updateDERAvailability (
    flecs::entity e,
    sep::DERAvailability & dderc ) [static]
```

update the DERAvailability resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/dera.hpp

## 14.187 ecs::client::derc::Module Struct Reference

```
#include <derc.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)
- **Module** (flecs::world &world)
- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERControl](#) (flecs::entity e, [sep::DERControlLink](#) &link)
- static void [updateDERControl](#) (flecs::entity e, [sep::DERControl](#) &derc)
- static void [getDERCapability](#) (flecs::entity e, [sep::DERCapabilityLink](#) &link)
- static void [updateDERCapability](#) (flecs::entity e, [sep::DERCapability](#) &derc)
- static void [getDERSettings](#) (flecs::entity e, [sep::DERSettingsLink](#) &link)
- static void [updateDERSettings](#) (flecs::entity e, [sep::DERSettings](#) &derg)

### 14.187.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERControl and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERSettings and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.187.2 Member Function Documentation

### 14.187.2.1 getDERCapability()

```
static void ecs::client::derc::Module::getDERCapability (
    flecs::entity e,
    sep::DERCapabilityLink & link ) [static]
```

request the DERControl resource from an IEEE 2030.5 Server

### 14.187.2.2 getDERControl()

```
static void ecs::client::derc::Module::getDERControl (
    flecs::entity e,
    sep::DERControlLink & link ) [static]
```

request the DERControl resource from an IEEE 2030.5 Server

### 14.187.2.3 getDERSettings()

```
static void ecs::client::derc::Module::getDERSettings (
    flecs::entity e,
    sep::DERSettingsLink & link ) [static]
```

request the DERSettings resource from an IEEE 2030.5 Server

### 14.187.2.4 updateDERCapability()

```
static void ecs::client::derc::Module::updateDERCapability (
    flecs::entity e,
    sep::DERCapability & derc ) [static]
```

update the DERControl resource and all its links

### 14.187.2.5 updateDERControl()

```
static void ecs::client::derc::Module::updateDERControl (
    flecs::entity e,
    sep::DERControl & derc ) [static]
```

update the DERControl resource and all its links

### 14.187.2.6 updateDERSettings()

```
static void ecs::client::derc::Module::updateDERSettings (
    flecs::entity e,
    sep::DERSettings & derg ) [static]
```

update the DERSettings resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/derc.hpp
- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/dercap.hpp
- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/derg.hpp



## 14.188 ecs::client::derp::Module Struct Reference

```
#include <derp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERProgram](#) (flecs::entity e, [sep::DERSettingsLink](#) &link)
- static void [updateDERProgram](#) (flecs::entity e, [sep::DERSettings](#) &derg)

### 14.188.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERProgram and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.188.2 Member Function Documentation

#### 14.188.2.1 getDERProgram()

```
static void ecs::client::derp::Module::getDERProgram (
    flecs::entity e,
    sep::DERSettingsLink & link ) [static]
```

request the DERProgram resource from an IEEE 2030.5 Server

#### 14.188.2.2 updateDERProgram()

```
static void ecs::client::derp::Module::updateDERProgram (
    flecs::entity e,
    sep::DERSettings & derg ) [static]
```

update the DERProgram resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/derp.hpp

## 14.189 ecs::client::ders::Module Struct Reference

```
#include <ders.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getDERProgram](#) (flecs::entity e, [sep::DERStatusLink](#) &link)
- static void [updateDERProgram](#) (flecs::entity e, [sep::DERStatus](#) &ders)

### 14.189.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the DERProgram and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.189.2 Member Function Documentation

#### 14.189.2.1 getDERProgram()

```
static void ecs::client::ders::Module::getDERProgram (  
    flecs::entity e,  
    sep::DERStatusLink & link ) [static]
```

request the DERProgram resource from an IEEE 2030.5 Server

#### 14.189.2.2 updateDERProgram()

```
static void ecs::client::ders::Module::updateDERProgram (  
    flecs::entity e,  
    sep::DERStatus & ders ) [static]
```

update the DERProgram resource and all its links

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/ders.hpp

## 14.190 ecs::client::edev::Module Struct Reference

```
#include <edev.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [getRegistration](#) (flecs::entity e, [sep::RegistrationLink](#) &link)
- static void [getDERListLink](#) (flecs::entity e, [sep::DERListLink](#) &link)
- static void [getFRPLListLink](#) (flecs::entity e, [sep::FlowReservationResponseListLink](#) &link)

### 14.190.1 Detailed Description

this module establishes the EndDevice as a component within the ECS world

### 14.190.2 Member Function Documentation

#### 14.190.2.1 getDERListLink()

```
void Module::getDERListLink (
    flecs::entity e,
    sep::DERListLink & link ) [static]
```

request the DERList resource from a IEEE 2030.5 Server

#### 14.190.2.2 getFRPLListLink()

```
void Module::getFRPLListLink (
    flecs::entity e,
    sep::FlowReservationResponseListLink & link ) [static]
```

request the FlowReservationResponseList from a IEEE 2030.5 Server

#### 14.190.2.3 getRegistration()

```
void Module::getRegistration (
    flecs::entity e,
    sep::RegistrationLink & link ) [static]
```

request the Registration resource from a IEEE 2030.5 Server

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

- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/include/ecs/client/sep/edev.hpp
- /home/tylor/dev/dae-egot-system/libs/ecs/client/sep/src/edev.cpp

## 14.191 ecs::client::frp::Module Struct Reference

```
#include <frp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

#### 14.191.1 Detailed Description

this modules establishes the FlowReservationResponse as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/frp.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/frp.cpp

## 14.192 ecs::client::frq::Module Struct Reference

```
#include <frq.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

#### 14.192.1 Detailed Description

this module establishes the FlowReservationRequest as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/frq.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/frq.cpp

## 14.193 ecs::client::fsa::Module Struct Reference

```
#include <fsa.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

## Static Public Member Functions

- static void `getFunctionSetAssignment` (flecs::entity e, `sep::FunctionSetAssignmentsListLink` &link)
- static void `updateFunctionSetAssignment` (flecs::entity e, `sep::FunctionSetAssignments` &fsa)

### 14.193.1 Detailed Description

This module sets the startup system for all IEEE 2030.5 resources by requesting the FunctionSetAssignment and updating the links it contains. It also establishes observers to make requests when the links are modified to keep other modules updated.

### 14.193.2 Member Function Documentation

#### 14.193.2.1 `getFunctionSetAssignment()`

```
static void ecs::client::fsa::Module::getFunctionSetAssignment (
    flecs::entity e,
    sep::FunctionSetAssignmentsListLink & link ) [static]
```

request the FunctionSetAssignment resource from an IEEE 2030.5 Server

#### 14.193.2.2 `updateFunctionSetAssignment()`

```
static void ecs::client::fsa::Module::updateFunctionSetAssignment (
    flecs::entity e,
    sep::FunctionSetAssignments & fsa ) [static]
```

update the FunctionSetAssignment resource and all its links

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/fsa.hpp

## 14.194 `ecs::client::ps::Module` Struct Reference

```
#include <ps.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.194.1 Detailed Description

this module establishes the PowerStatus resource as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/ps.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/ps.cpp

## 14.195 ecs::client::rg::Module Struct Reference

```
#include <rg.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.195.1 Detailed Description

this module establishes the Registration resources as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/rg.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/rg.cpp

## 14.196 ecs::client::rsp::Module Struct Reference

```
#include <rsp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.196.1 Detailed Description

this module establishes the Response as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/rsp.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/rsp.cpp

## 14.197 ecs::client::rsps::Module Struct Reference

```
#include <rsps.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.197.1 Detailed Description

this module establishes the ResponseSet as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/rsps.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/rsps.cpp

## 14.198 ecs::client::tm::Module Struct Reference

```
#include <tm.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.198.1 Detailed Description

this module establishes the Time resource as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/include/ecs/client/sep/tm.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/tm.cpp

## 14.199 ecs::server::dcap::Module Struct Reference

```
#include <dcap.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.199.1 Detailed Description

this module establishes the DeviceCapability as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/dcap.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/dcap.cpp

## 14.200 ecs::server::der::Module Struct Reference

```
#include <der.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.200.1 Detailed Description

this module establishes the DER and all its sub resources as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/der.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/der.cpp

## 14.201 ecs::server::edev::Module Struct Reference

```
#include <edev.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.201.1 Detailed Description

This module sets the EndDevice resources as a component within the ECS

Note: eventually there may be a system that is required to check for updates to EndDevices that need to be propagated throughout the rest of the server

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/edev.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/edev.cpp



## 14.202 ecs::server::frp::Module Struct Reference

```
#include <frp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.202.1 Detailed Description

This module establishes the FlowReservationResponse as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/frp.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/frp.cpp

## 14.203 ecs::server::frq::Module Struct Reference

```
#include <frq.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.203.1 Detailed Description

this module establishes the FlowReservationRequest resource as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/frq.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/frq.cpp

## 14.204 ecs::server::ps::Module Struct Reference

```
#include <ps.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.204.1 Detailed Description

this module establishes the PowerStatus resource as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/ps.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/ps.cpp

## 14.205 ecs::server::rg::Module Struct Reference

```
#include <rg.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.205.1 Detailed Description

this module establishes the Registration resources as a component within the ECS world

It is also responsible for requesting groups from a Grid Operator that establishes the hierarchical topology of the system

It also will synchronize with the Grid Operator Time by setting the offset

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/rg.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/rg.cpp

## 14.206 ecs::server::rsp::Module Struct Reference

```
#include <rsp.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.206.1 Detailed Description

this module sets the Response resource as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/rsp.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/rsp.cpp

## 14.207 ecs::server::sdev::Module Struct Reference

```
#include <sdev.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### 14.207.1 Detailed Description

This module establishes the SelfDevice as a component within the ECS world

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/sdev.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/sdev.cpp

## 14.208 ecs::server::time::Module Struct Reference

```
#include <time.hpp>
```

### Public Member Functions

- **Module** (flecs::world &world)

### Static Public Member Functions

- static void [updateTime](#) (flecs::entity e, [sep::Time](#) &tm)

### 14.208.1 Detailed Description

this module established the Time resources as a component within the ECS world

### 14.208.2 Member Function Documentation

### 14.208.2.1 updateTime()

```
void ecs::server::time::Module::updateTime (
    flecs::entity e,
    sep::Time & tm ) [static]
```

updates the Time resource ever second for all clients rather than updating every time the server receives a request

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/time.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/time.cpp

## 14.209 ecs::simulator::waterheater::Module Struct Reference

### Public Member Functions

- **Module** (flecs::world &world)

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

- /home/tylor/dev/does-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/simulator/src/waterheater.cpp

## 14.210 ecs::singleton::Module Struct Reference

### Public Member Functions

- **Module** (flecs::world &world)

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

- /home/tylor/dev/does-egot-system/libs/ecs/singleton/include/ecs/singleton/clock.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/client/sep/src/fsa.cpp
- /home/tylor/dev/does-egot-system/libs/ecs/singleton/src/clock.cpp

## 14.211 ecs::simulator::waterheater::Nameplate Struct Reference

### Public Attributes

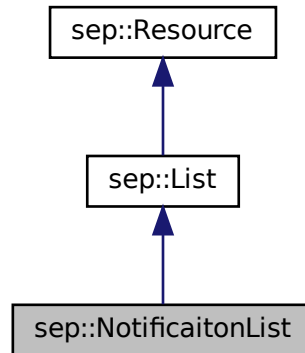
- uint16\_t **gallons**
- uint16\_t **temperature\_setpoint**
- uint16\_t **inlet\_temperature**
- uint16\_t **power**

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

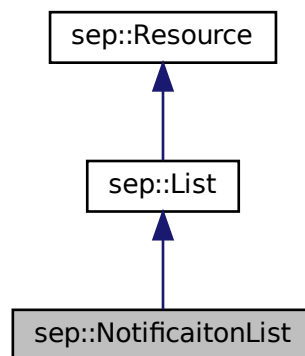
- /home/tylor/dev/does-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp

## 14.212 sep::NotificaitonList Struct Reference

Inheritance diagram for sep::NotificaitonList:



Collaboration diagram for sep::NotificaitonList:



### Public Attributes

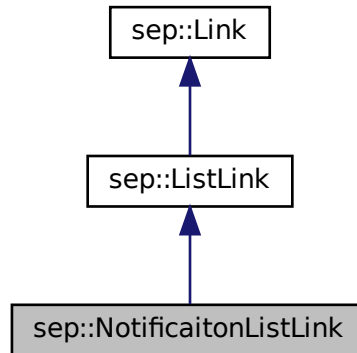
- `std::vector< Notification > notifications`

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

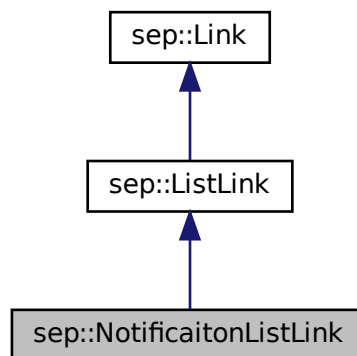
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/notification.hpp`

## 14.213 sep::NotificaitonListLink Struct Reference

Inheritance diagram for sep::NotificaitonListLink:



Collaboration diagram for sep::NotificaitonListLink:



### Additional Inherited Members

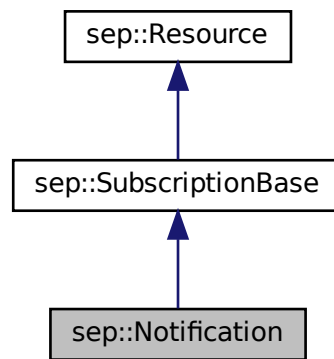
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/notification.hpp

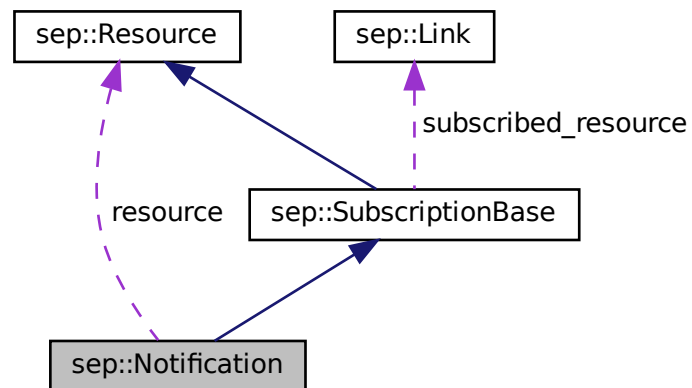
## 14.214 sep::Notification Struct Reference

```
#include <notification.hpp>
```

Inheritance diagram for sep::Notification:



Collaboration diagram for sep::Notification:



### Public Types

- enum class **Status** : UInt8 {  
**DEFAULT\_STATUS** , **CANCELED** , **MOVED** , **CHANGED** ,  
**DELETED** }

## Public Attributes

- std::string **new\_resource\_uri**
- [Resource](#) **resource**
- Status **status**
- std::string **subscription\_uri**

### 14.214.1 Detailed Description

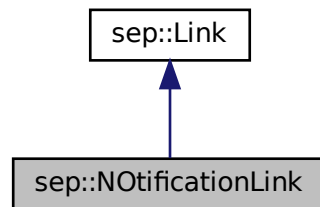
Holds the information related to a client subscription to receive updates to a resource automatically. The actual resources may be passed in the [Notification](#) by specifying a specific xsi:type for the [Resource](#) and passing the full representation.

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

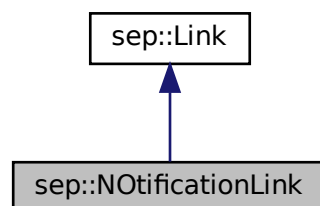
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/notification.hpp

## 14.215 sep::NOTificationLink Struct Reference

Inheritance diagram for sep::NOTificationLink:



Collaboration diagram for sep::NOTificationLink:





## Additional Inherited Members

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/notification.hpp

## 14.216 sep::Offset Struct Reference

```
#include <offset.hpp>
```

### Public Attributes

- UInt8 **cooling\_offset**
- UInt8 **heating\_offset**
- PerCent **load\_adjustment\_percentage\_offset**

### 14.216.1 Detailed Description

If a temperature offset is sent that causes the heating or cooling temperature set point to exceed the limit boundaries that are programmed into the device, the device SHALL respond by setting the temperature at the limit.

If an EDC is being targeted at multiple devices or to a device that controls multiple devices (e.g., EMS), it can provide multiple [Offset](#) types within one EDC. For events with multiple [Offset](#) types, a client SHALL select the [Offset](#) that best fits their operating function.

Alternatively, an event with a single [Offset](#) type can be targeted at an EMS in order to request a percentage load reduction on the average energy usage of the entire premise. An EMS SHOULD use the Metering function set to determine the initial load in the premise, reduce energy consumption by controlling devices at its disposal, and at the conclusion of the event, once again use the Metering function set to determine if the desired load reduction was achieved

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/offset.hpp

## 14.217 sep::OperationalModeStatusType Struct Reference

### Public Types

- enum class **Status** : UInt8 { **kNA** , **kOff** , **kOperationalMode** , **kTestMode** }

### Public Attributes

- TimeType **date\_time**
- Status **value**

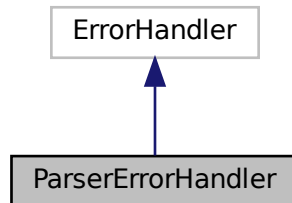
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/operational\_mode\_status\_type.hpp

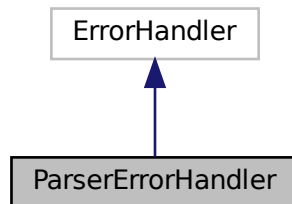
## 14.218 ParserErrorHandler Class Reference

```
#include <xml_validator.hpp>
```

Inheritance diagram for ParserErrorHandler:



Collaboration diagram for ParserErrorHandler:



### Public Member Functions

- void **warning** (const SAXParseException &ex)
- void **error** (const SAXParseException &ex)
- void **fatalError** (const SAXParseException &ex)
- void **resetErrors** ()

### 14.218.1 Detailed Description

display errors to terminal when validating

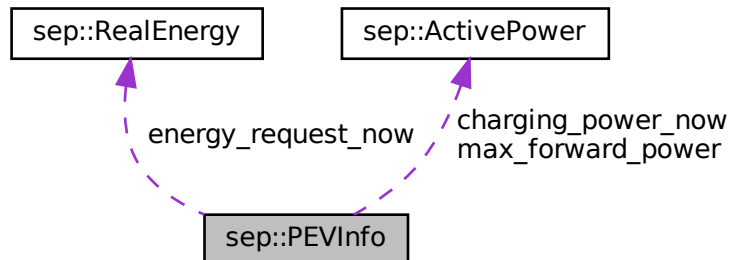
Note: this should be sent to a log file instead of a terminal

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

- /home/tylor/dev/does-egot-system/libs/sep/xml/include/sep/xml/xml\_validator.hpp

## 14.219 sep::PEVInfo Struct Reference

Collaboration diagram for sep::PEVInfo:



### Public Attributes

- [ActivePower](#) `charging_power_now`
- [RealEnergy](#) `energy_request_now`
- [ActivePower](#) `max_forward_power`
- `UInt32` `minimum_charging_duration`
- `PerCent` `target_state_of_charge`
- `TimeType` `time_charge_is_needed`
- `TimeType` `time_charging_status_pev`

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

- `/home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/pev_info.hpp`

## 14.220 sunspec::point::Point< T > Class Template Reference

### Public Member Functions

- `void` `Print` ()
- `virtual T` `GetValue` ()=0
- `virtual void` `SetValue` (T value)

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

- `/home/tylor/dev/dae-egot-system/libs/sunspec-modbus/include/sunspec/point.hpp`

## 14.221 Position Struct Reference

### Public Attributes

- double **x**
- double **y**

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

- /home/tylor/dev/does-egot-system/apps/simple/src/solar.cpp

## 14.222 ecs::simulator::waterheater::Power Struct Reference

### Public Attributes

- float **watts**

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

- /home/tylor/dev/does-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp

## 14.223 Power Struct Reference

### Public Attributes

- double **real**
- double **imag**

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

- /home/tylor/dev/does-egot-system/apps/simple/src/main.cpp

## 14.224 sep::PowerConfiguration Struct Reference

```
#include <power_configuration.hpp>
```

### Public Attributes

- TimeType **battery\_install\_time**
- UInt32 **low\_charge\_threshold**

### 14.224.1 Detailed Description

Contains configuration related to the device's power sources

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/power\_configuration.hpp

## 14.225 sep::PowerFactor Struct Reference

```
#include <power_factor.hpp>
```

### Public Attributes

- UInt16 **displacement**
- PowerOfTenMultiplierType **multiplier**

### 14.225.1 Detailed Description

Specifies a setpoint for Displacement **Power** Factor, the ratio between apparent and active powers at the fundamental frequency (e.g. 60 Hz).

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/power\_factor.hpp

## 14.226 sep::PowerFactorWithExcitation Struct Reference

```
#include <power_factor_with_excitation.hpp>
```

### Public Attributes

- UInt16 **displacement**
- bool **excitation**
- PowerOfTenMultiplierType **multiplier**

### 14.226.1 Detailed Description

Specifies a setpoint for Displacement **Power** Factor, the ratio between apparent and active powers at the fundamental frequency (e.g. 60 Hz) and includes an excitation flag.

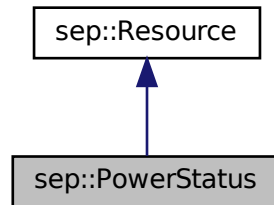
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/power\_factor\_with\_excitation.hpp

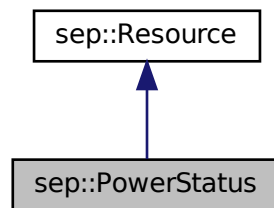
## 14.227 sep::PowerStatus Struct Reference

```
#include <power_status.hpp>
```

Inheritance diagram for sep::PowerStatus:



Collaboration diagram for sep::PowerStatus:



### Public Attributes

- BatteryStatus **battery\_status**
- TimeType **changed\_time**
- PowerSourceType **current\_power\_source**
- UInt32 **poll\_rate**
- boost::optional< PerCent > **estimated\_charge\_remaining**
- boost::optional< UInt32 > **estimated\_time\_remaining**
- boost::optional< [PEVInfo](#) > **pev\_info**
- boost::optional< UInt32 > **session\_time\_on\_battery**
- boost::optional< UInt32 > **total\_time\_on\_battery**

### 14.227.1 Detailed Description

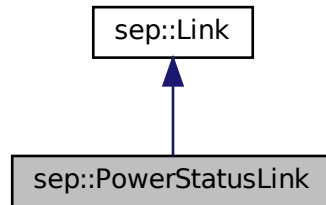
Contains the status of the device's power sources

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

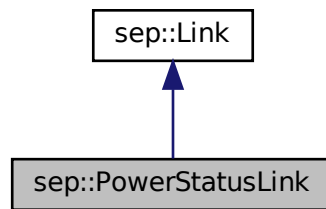
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/power\_status.hpp

## 14.228 sep::PowerStatusLink Struct Reference

Inheritance diagram for sep::PowerStatusLink:



Collaboration diagram for sep::PowerStatusLink:



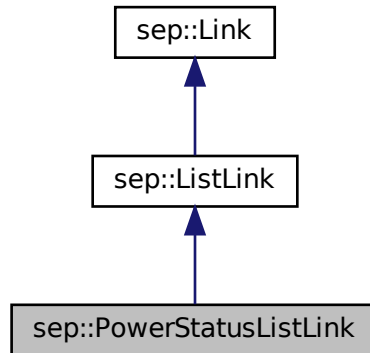
### Additional Inherited Members

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

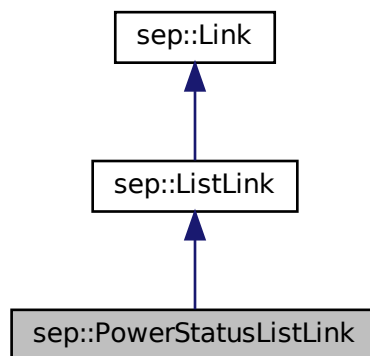
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/power\_status.hpp

## 14.229 sep::PowerStatusListLink Struct Reference

Inheritance diagram for sep::PowerStatusListLink:



Collaboration diagram for sep::PowerStatusListLink:



### Additional Inherited Members

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

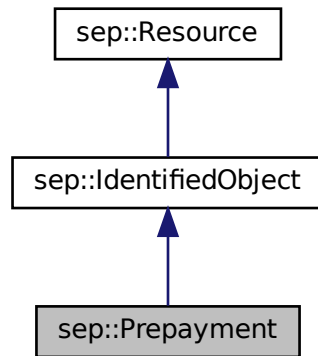
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/power\_status.hpp



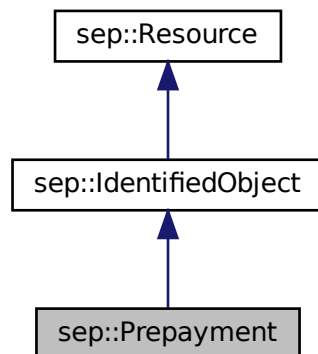
## 14.230 sep::Prepayment Struct Reference

```
#include <prepayment.hpp>
```

Inheritance diagram for sep::Prepayment:



Collaboration diagram for sep::Prepayment:



### Additional Inherited Members

#### 14.230.1 Detailed Description

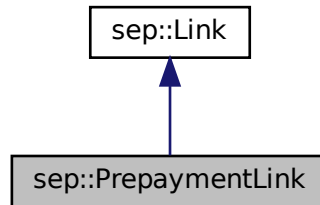
[Prepayment](#) (inherited from CIM SDPAccountingFunction)

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

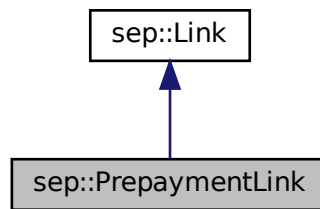
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/prepayment.hpp

## 14.231 sep::PrepaymentLink Struct Reference

Inheritance diagram for sep::PrepaymentLink:



Collaboration diagram for sep::PrepaymentLink:



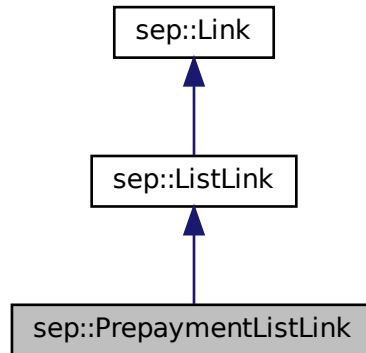
### Additional Inherited Members

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

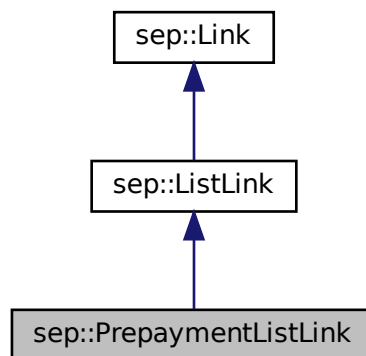
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/prepayment.hpp

## 14.232 sep::PrepaymentListLink Struct Reference

Inheritance diagram for sep::PrepaymentListLink:



Collaboration diagram for sep::PrepaymentListLink:



### Additional Inherited Members

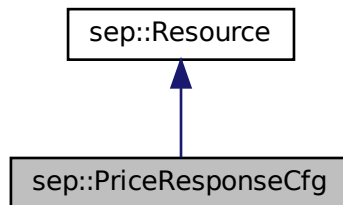
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/prepayment.hpp

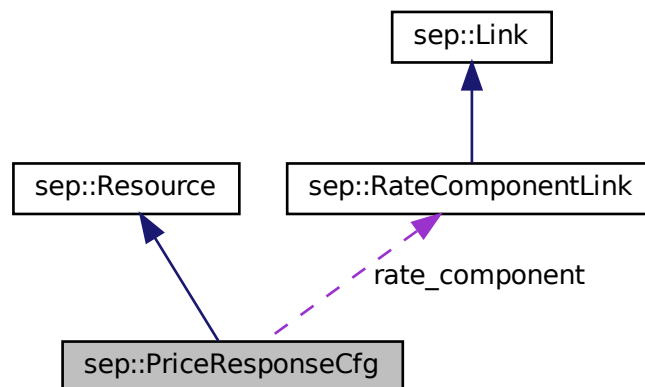
## 14.233 sep::PriceResponseCfg Struct Reference

```
#include <price_response_configuration.hpp>
```

Inheritance diagram for sep::PriceResponseCfg:



Collaboration diagram for sep::PriceResponseCfg:



### Public Attributes

- Int32 **consume\_threshold**
- Int32 **max\_reduction\_threshold**
- [RateComponentLink](#) **rate\_component**

### 14.233.1 Detailed Description

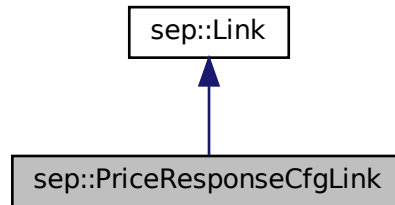
[Configuration](#) data that specifies how price responsive devices SHOULD respond to price changes while acting upon a given [RateComponent](#).

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

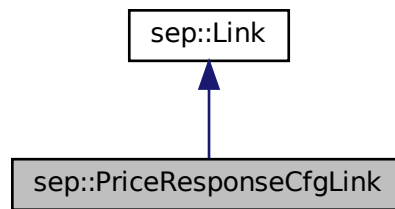
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/price\_response\_configuration.hpp

## 14.234 sep::PriceResponseCfgLink Struct Reference

Inheritance diagram for sep::PriceResponseCfgLink:



Collaboration diagram for sep::PriceResponseCfgLink:



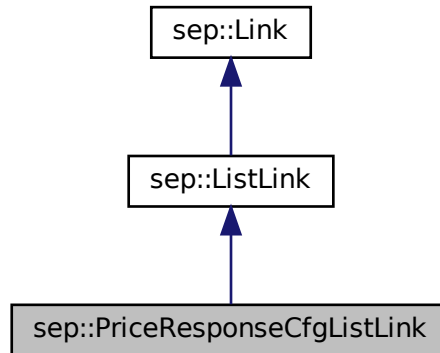
### Additional Inherited Members

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

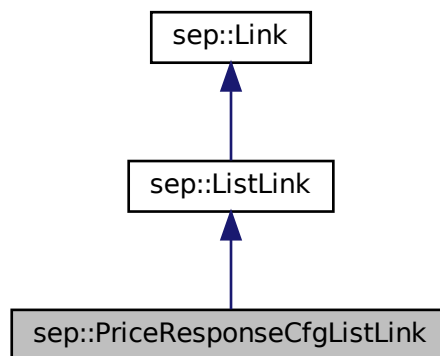
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/price\_response\_configuration.hpp

## 14.235 sep::PriceResponseCfgListLink Struct Reference

Inheritance diagram for sep::PriceResponseCfgListLink:



Collaboration diagram for sep::PriceResponseCfgListLink:



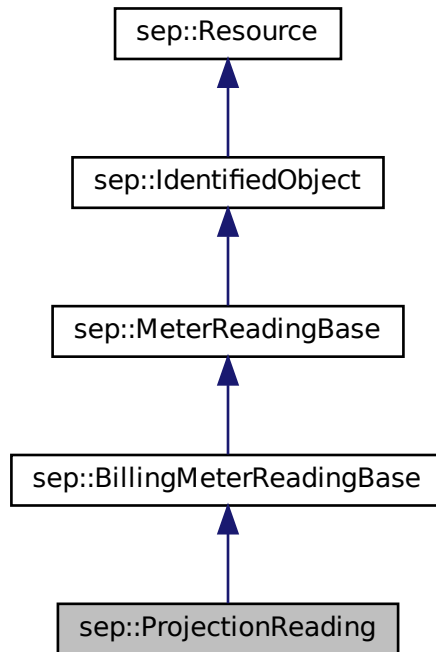
### Additional Inherited Members

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

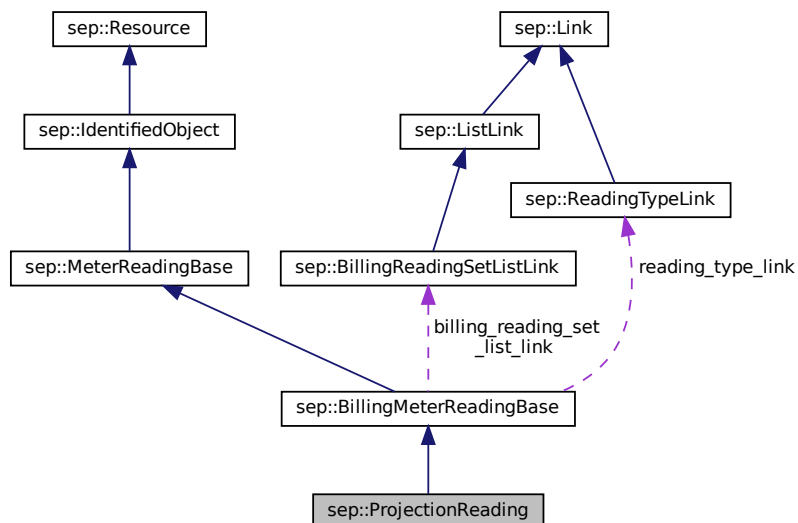
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/price\_response\_configuration.hpp

## 14.236 sep::ProjectionReading Struct Reference

Inheritance diagram for sep::ProjectionReading:



Collaboration diagram for sep::ProjectionReading:



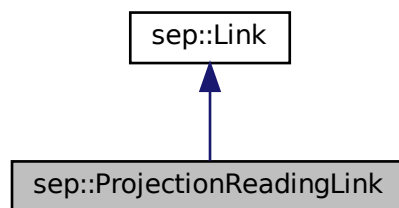
## Additional Inherited Members

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

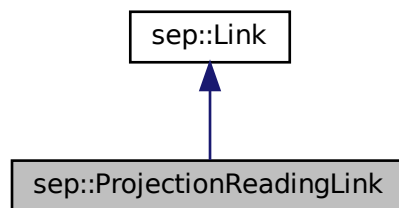
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.237 sep::ProjectionReadingLink Struct Reference

Inheritance diagram for sep::ProjectionReadingLink:



Collaboration diagram for sep::ProjectionReadingLink:



## Additional Inherited Members

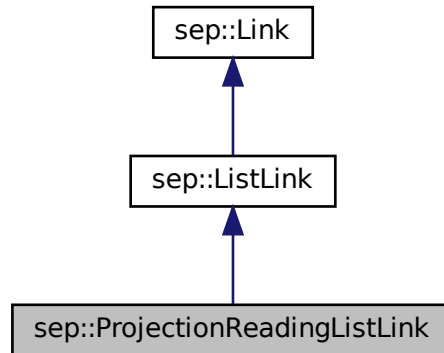
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

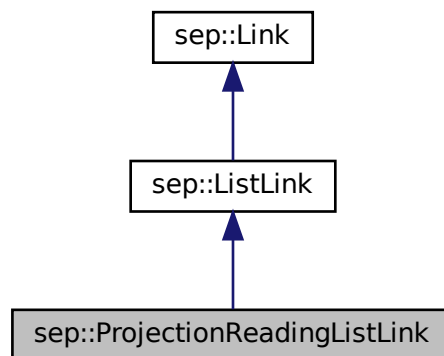


## 14.238 sep::ProjectionReadingListLink Struct Reference

Inheritance diagram for sep::ProjectionReadingListLink:



Collaboration diagram for sep::ProjectionReadingListLink:



### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.239 sep::WADLResource::Properties Struct Reference

### Public Attributes

- bool **allow**
- std::vector< std::string > **content\_type**
- std::vector< unsigned int > **status**
- std::vector< std::string > **params**

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

- /home/tylor/dev/does-egot-system/libs/sep/wadl/include/sep/wadl/wadl.hpp

## 14.240 ecs::server::Query Struct Reference

```
#include <href.hpp>
```

### Public Attributes

- uint16\_t **start**
- uint64\_t **after**
- uint16\_t **limit**

### 14.240.1 Detailed Description

Utility structure to handle query string parameters

#### Parameters

<i>start</i>	is the index value of the list requested to start from
<i>after</i>	can be used instead of start to point to where the index should begin
<i>limit</i>	ensures the list remains under the specified size

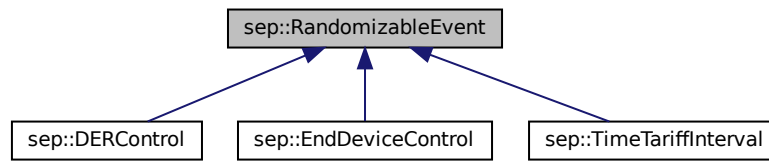
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/href.hpp

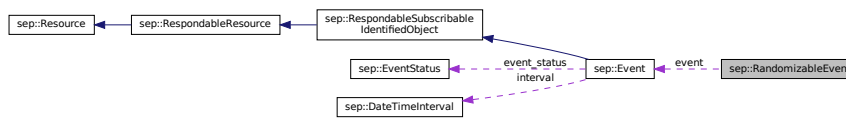
## 14.241 sep::RandomizableEvent Struct Reference

```
#include <randomizable_event.hpp>
```

Inheritance diagram for sep::RandomizableEvent:



Collaboration diagram for sep::RandomizableEvent:



## Public Attributes

- [Event](#) `event`
- OneHourRangeType `randomize_duration`
- OneHourRangeType `randomize_start`

### 14.241.1 Detailed Description

An [Event](#) that can indicate time ranges over which the start time and duration SHALL be randomized.

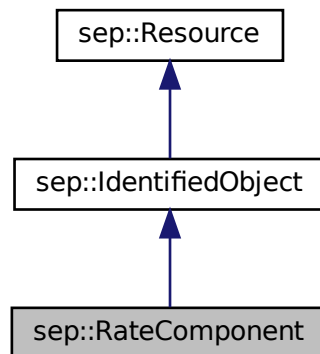
The documentation for this struct was generated from the following file:

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/randomizable_event.hpp`

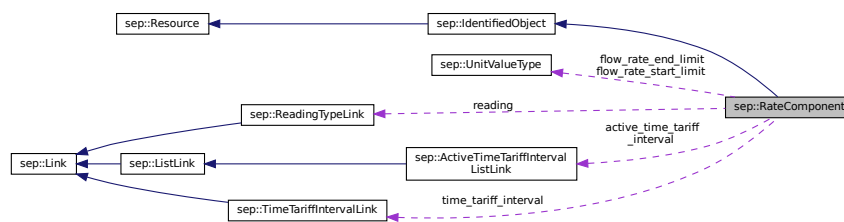
## 14.242 sep::RateComponent Struct Reference

```
#include <rate_component.hpp>
```

Inheritance diagram for sep::RateComponent:



Collaboration diagram for sep::RateComponent:



## Public Attributes

- [ActiveTimeTariffIntervalListLink](#) **active\_time\_tariff\_interval**
- [UnitValueType](#) **flow\_rate\_end\_limit**
- [UnitValueType](#) **flow\_rate\_start\_limit**
- [ReadingTypeLink](#) **reading**
- [RoleFlagsType](#) **role\_flag**
- [TimeTariffIntervalLink](#) **time\_tariff\_interval**

### 14.242.1 Detailed Description

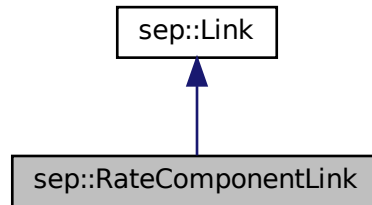
Specifies the applicable charges for a single component of the rate, which could be generation price or consumption price, for example.

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

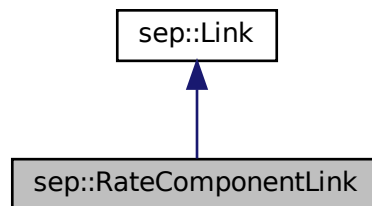
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/rate\_component.hpp

## 14.243 sep::RateComponentLink Struct Reference

Inheritance diagram for sep::RateComponentLink:



Collaboration diagram for sep::RateComponentLink:



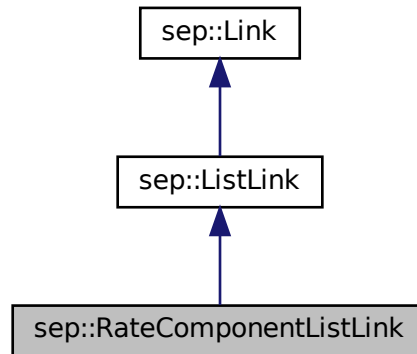
### Additional Inherited Members

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

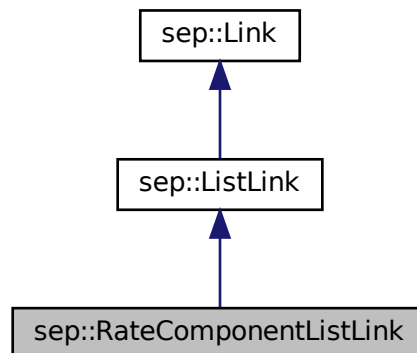
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/rate\_component.hpp

## 14.244 sep::RateComponentListLink Struct Reference

Inheritance diagram for sep::RateComponentListLink:



Collaboration diagram for sep::RateComponentListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/rate\_component.hpp

## 14.245 sep::ReactivePower Struct Reference

```
#include <reactive_power.hpp>
```

## Public Attributes

- PowerOfTenMultiplierType **multiplier**
- Int16 **value**

### 14.245.1 Detailed Description

The reactive power  $Q$  (in var) is the product of root mean square (RMS) voltage, RMS current, and  $\sin(\theta)$  where  $\theta$  is the phase angle of current relative to voltage.

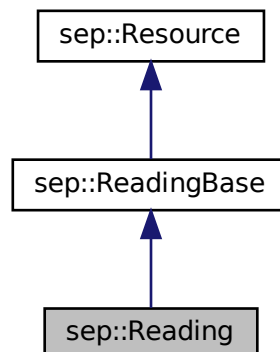
The documentation for this struct was generated from the following file:

- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/reactive\_power.hpp

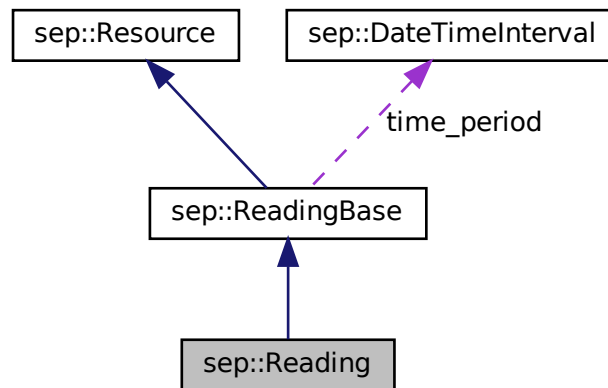
### 14.246 sep::Reading Struct Reference

```
#include <reading.hpp>
```

Inheritance diagram for sep::Reading:



Collaboration diagram for sep::Reading:



### Public Attributes

- Int16 **local\_id**
- SubscribableType **subscribable**

### Additional Inherited Members

#### 14.246.1 Detailed Description

Specific value measured by a meter or other asset.

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

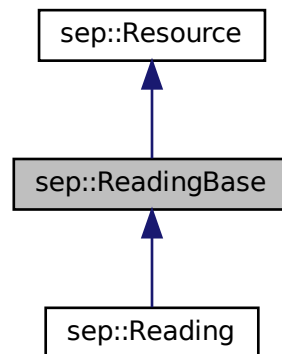
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading.hpp

## 14.247 sep::ReadingBase Struct Reference

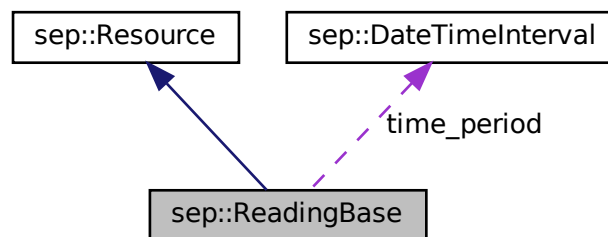
```
#include <reading_base.hpp>
```



Inheritance diagram for sep::ReadingBase:



Collaboration diagram for sep::ReadingBase:



## Public Types

- enum class **QualityFlags** : UInt16 {  
**kValid** = 1 << 0 , **kManuallyEdited** = 1 << 1 , **kEstimatedUsingReferenceDay** = 1 << 2 , **kEstimatedUsingLinearInterpolation** = 1 << 3 ,  
**kQuestionable** = 1 << 4 , **kDerived** = 1 << 5 , **kProjected** = 1 << 6 }

## Public Attributes

- ConsumptionBlock **consumption\_block**
- QualityFlags **quality\_flags**
- [DateTimeInterval](#) **time\_period**
- TOUType **tou\_tier**
- UInt64 **value**

### 14.247.1 Detailed Description

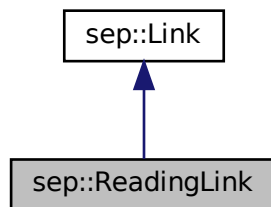
Specific value measured by a meter or other asset. [ReadingBase](#) is abstract, used to define the elements common to [Reading](#) and [IntervalReading](#).

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

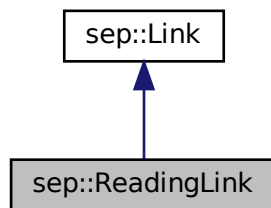
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading_base.hpp`

## 14.248 sep::ReadingLink Struct Reference

Inheritance diagram for sep::ReadingLink:



Collaboration diagram for sep::ReadingLink:



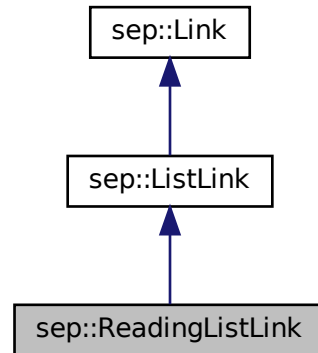
### Additional Inherited Members

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

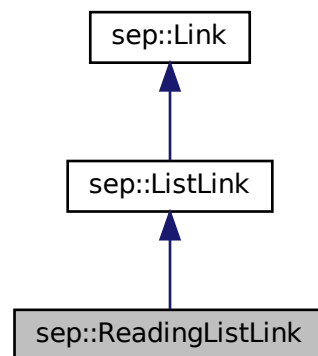
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading.hpp`

## 14.249 sep::ReadingListLink Struct Reference

Inheritance diagram for sep::ReadingListLink:



Collaboration diagram for sep::ReadingListLink:



### Additional Inherited Members

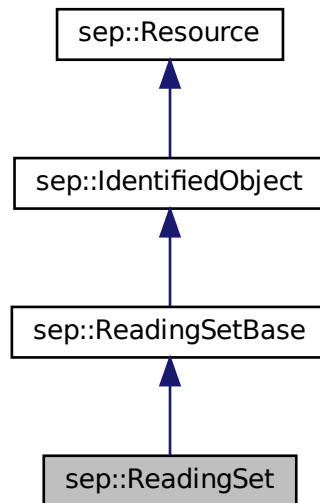
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/reading.hpp

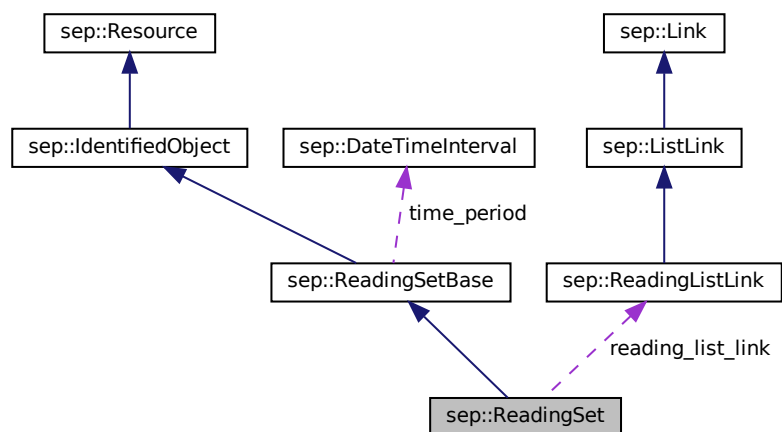
## 14.250 sep::ReadingSet Struct Reference

```
#include <reading_set_base.hpp>
```

Inheritance diagram for sep::ReadingSet:



Collaboration diagram for sep::ReadingSet:



### Public Attributes

- [ReadingListLink](#) `reading_list_link`

### 14.250.1 Detailed Description

A set of Readings of the [ReadingType](#) indicated by the parent [MeterReading](#).

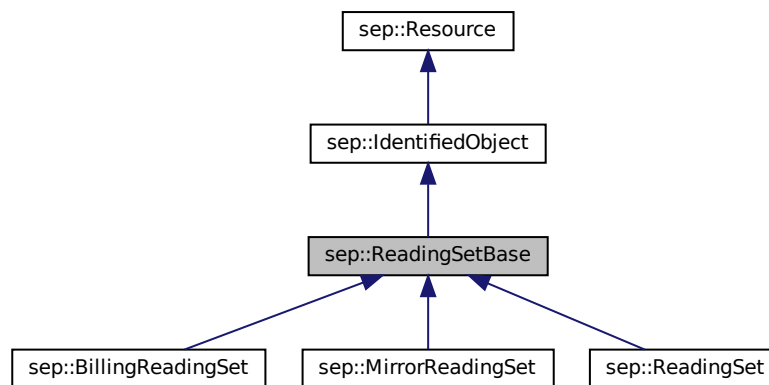
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading\_set\_base.hpp

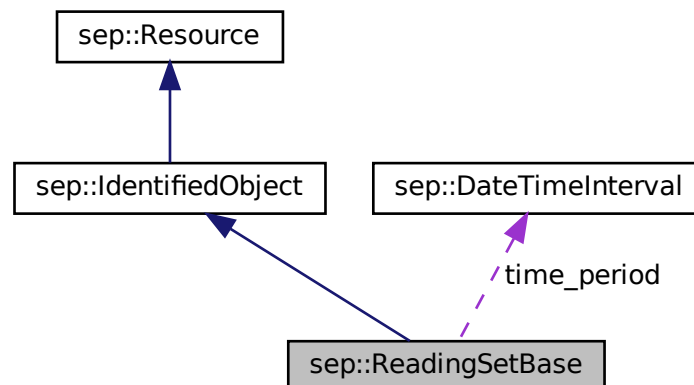
### 14.251 sep::ReadingSetBase Struct Reference

```
#include <reading_set_base.hpp>
```

Inheritance diagram for sep::ReadingSetBase:



Collaboration diagram for sep::ReadingSetBase:



## Public Attributes

- [DateTimeInterval](#) time\_period

### 14.251.1 Detailed Description

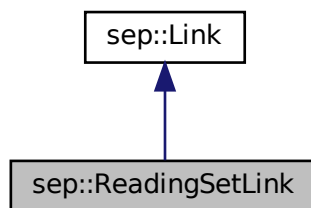
A set of Readings of the [ReadingType](#) indicated by the parent [MeterReading](#). [ReadingBase](#) is abstract, used to define the elements common to [ReadingSet](#) and [IntervalBlock](#).

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

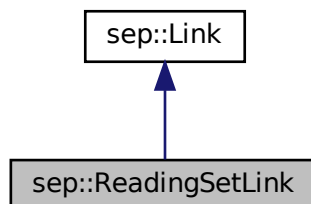
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading\_set\_base.hpp

## 14.252 sep::ReadingSetLink Struct Reference

Inheritance diagram for sep::ReadingSetLink:



Collaboration diagram for sep::ReadingSetLink:



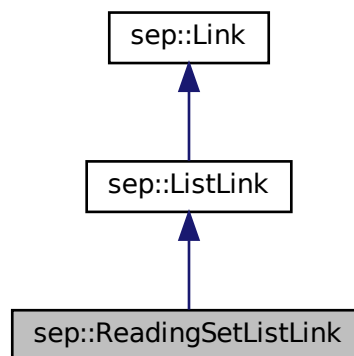
## Additional Inherited Members

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

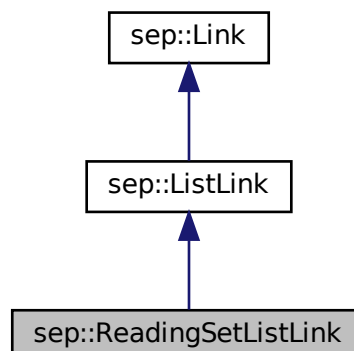
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading\_set\_base.hpp

## 14.253 sep::ReadingSetListLink Struct Reference

Inheritance diagram for sep::ReadingSetListLink:



Collaboration diagram for sep::ReadingSetListLink:



## Additional Inherited Members

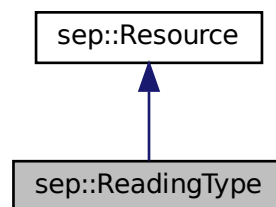
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading\_set\_base.hpp

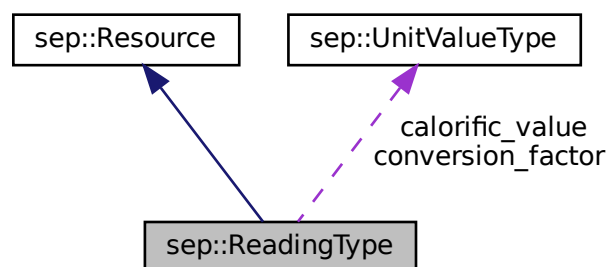
## 14.254 sep::ReadingType Struct Reference

```
#include <reading_type.hpp>
```

Inheritance diagram for sep::ReadingType:



Collaboration diagram for sep::ReadingType:



## Public Attributes

- AccumulationBehaviourType **accumulation\_behaviour**
- UnitValueType **calorific\_value**
- CommodityType **commodity**
- UnitValueType **conversion\_factor**



- DataQualifierType **data\_qualifier**
- FlowDirectionType **flow\_direction**
- UInt32 **interval\_length**
- KindType **kind**
- UInt8 **max\_number\_of\_intervals**
- UInt8 **number\_of\_consumption\_blocks**
- UInt8 **number\_of\_tou\_tiers**
- PhaseCode **phase**
- PowerOfTenMultiplierType **power\_of\_ten\_multiplier**
- UInt32 **sub\_interval\_length**
- UInt48 **supply\_limit**
- bool **tiered\_consumption\_blocks**
- UomType **uom**

### 14.254.1 Detailed Description

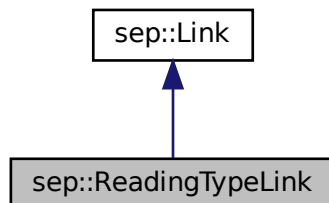
Type of data conveyed by a specific [Reading](#). See IEC 61968 Part 9 Annex C for full definitions of these values.

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

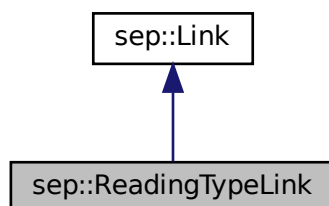
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/reading\_type.hpp

## 14.255 sep::ReadingTypeLink Struct Reference

Inheritance diagram for sep::ReadingTypeLink:



Collaboration diagram for sep::ReadingTypeLink:



## Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/reading\_type.hpp

## 14.256 sep::RealEnergy Struct Reference

```
#include <real_energy.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UInt48 **value**

### 14.256.1 Detailed Description

Real electrical energy

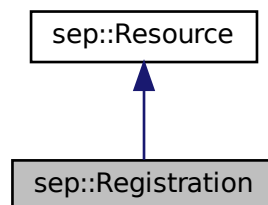
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/real\_energy.hpp

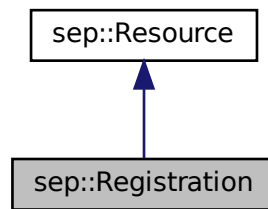
## 14.257 sep::Registration Struct Reference

```
#include <registration.hpp>
```

Inheritance diagram for sep::Registration:



Collaboration diagram for sep::Registration:



### Public Attributes

- TimeType **date\_time\_registered**
- PINType **pin**
- UInt32 **poll\_rate** = 900

#### 14.257.1 Detailed Description

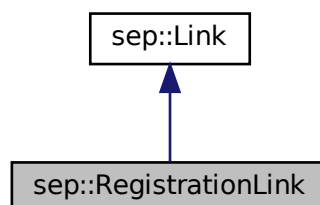
[Registration](#) represents an authorization to access the resources on a host.

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

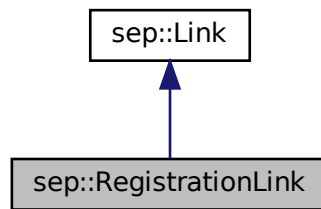
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/registration.hpp

### 14.258 sep::RegistrationLink Struct Reference

Inheritance diagram for sep::RegistrationLink:



Collaboration diagram for sep::RegistrationLink:



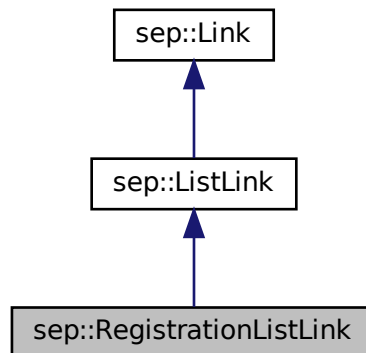
### Additional Inherited Members

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

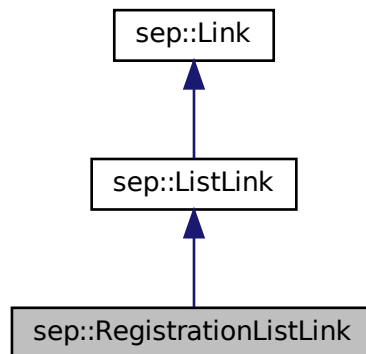
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/registration.hpp

## 14.259 sep::RegistrationListLink Struct Reference

Inheritance diagram for sep::RegistrationListLink:



Collaboration diagram for sep::RegistrationListLink:



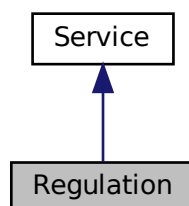
### Additional Inherited Members

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

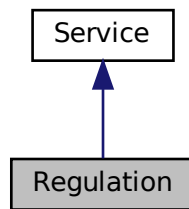
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/registration.hpp

## 14.260 Regulation Struct Reference

Inheritance diagram for Regulation:



Collaboration diagram for Regulation:



### Public Attributes

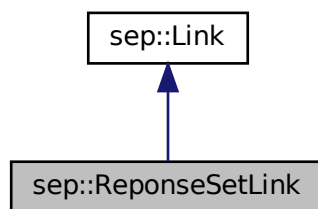
- `std::unordered_map< double, double > curve`

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

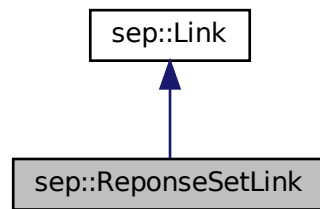
- `/home/tylor/dev/does-egot-system/apps/simple/src/main.cpp`

## 14.261 sep::ReponseSetLink Struct Reference

Inheritance diagram for sep::ReponseSetLink:



Collaboration diagram for sep::ReponseSetLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response\_set.hpp

## 14.262 sep::RequestStatus Struct Reference

```
#include <request_status.hpp>
```

### Public Types

- enum class **Status** : UInt8 { **kRequested** , **kCancelled** }

### Public Attributes

- TimeType **datetime**
- Status **status**

### 14.262.1 Detailed Description

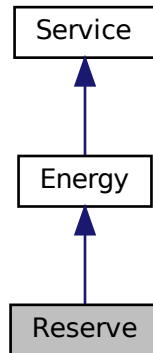
The [RequestStatus](#) object is used to indicate the current status of a Flow Reservation Request.

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

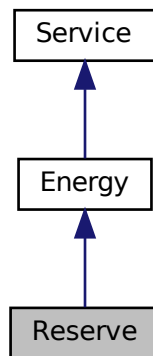
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/request\_status.hpp

## 14.263 Reserve Struct Reference

Inheritance diagram for Reserve:



Collaboration diagram for Reserve:



### Additional Inherited Members

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

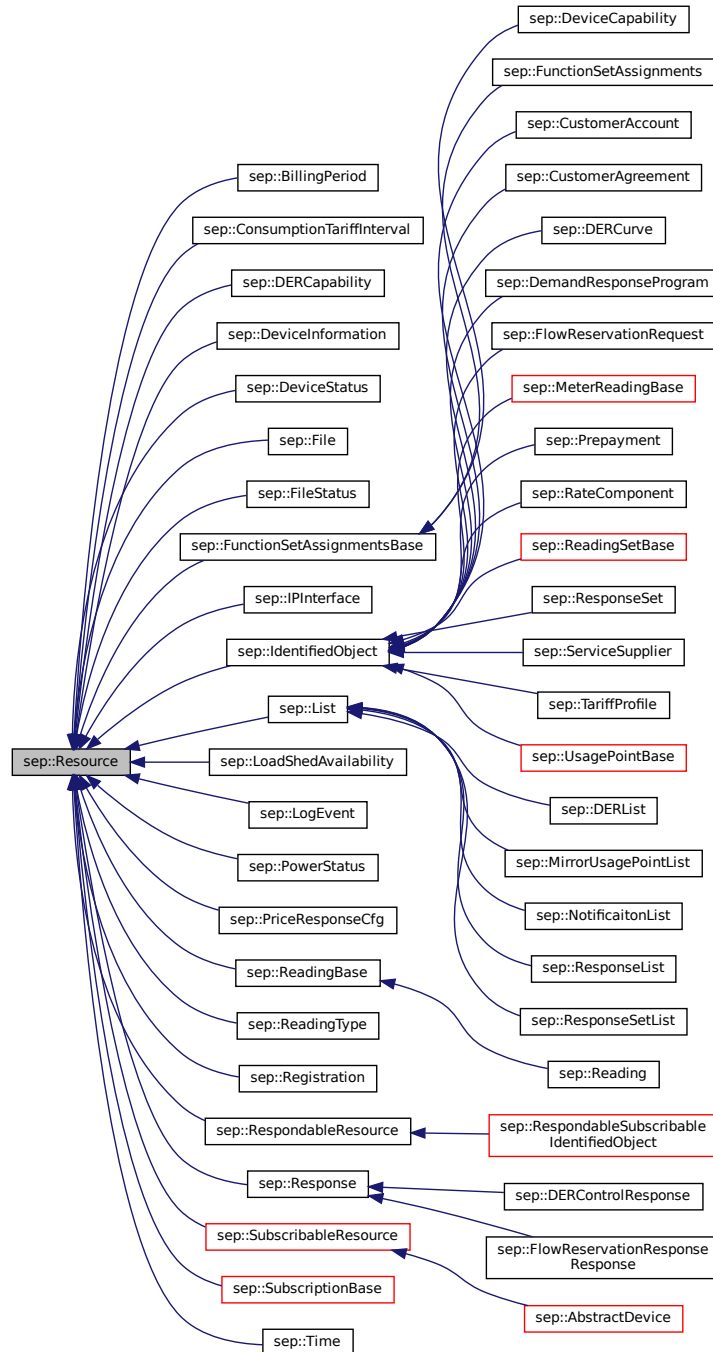
- /home/tylor/dev/doe-egot-system/apps/simple/src/main.cpp



## 14.264 sep::Resource Struct Reference

```
#include <simple_types.hpp>
```

Inheritance diagram for sep::Resource:



### Public Attributes

- `std::string href`

### 14.264.1 Detailed Description

The subscription from which this notification was triggered. This attribute SHALL be a fully-qualified absolute URI, not a relative reference.

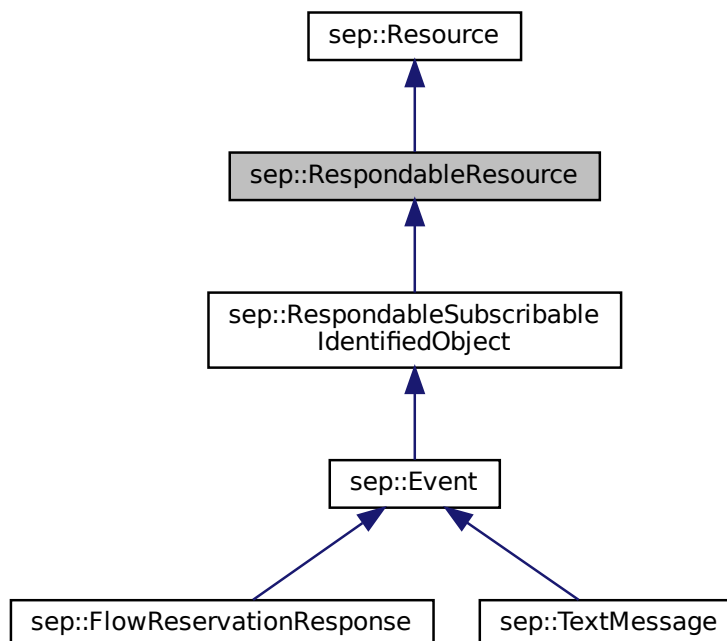
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/simple\_types.hpp

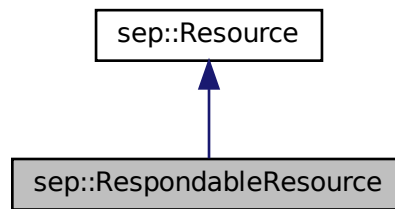
## 14.265 sep::ResponsibleResource Struct Reference

```
#include <responsible_resource.hpp>
```

Inheritance diagram for sep::ResponsibleResource:



Collaboration diagram for sep::ResponsibleResource:



## Public Types

- enum class **ResponseRequired** : HexBinary8 { **kRecieved** , **kSpecificResponse** , **kResponseRequired** }

## Public Attributes

- std::string **reply\_to**
- ResponseRequired **response\_required**

### 14.265.1 Detailed Description

A [Resource](#) to which a [Response](#) can be requested.

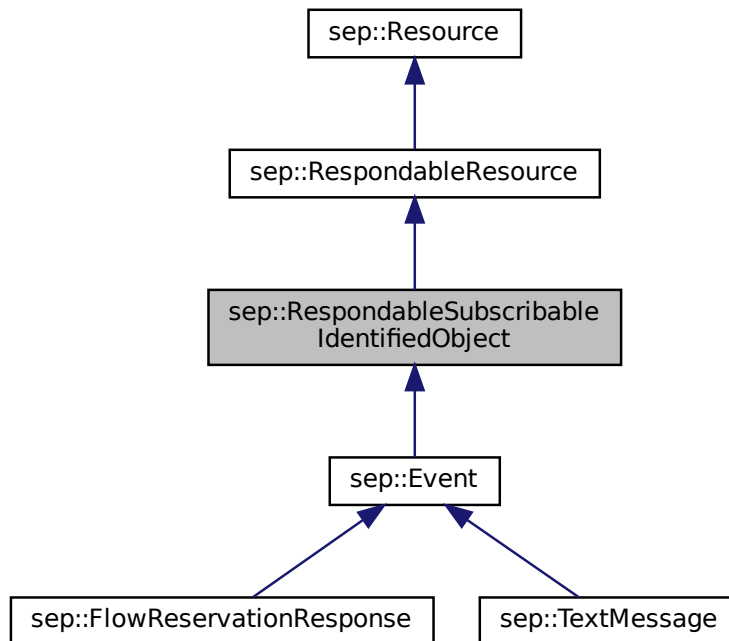
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/responsible\_resource.hpp

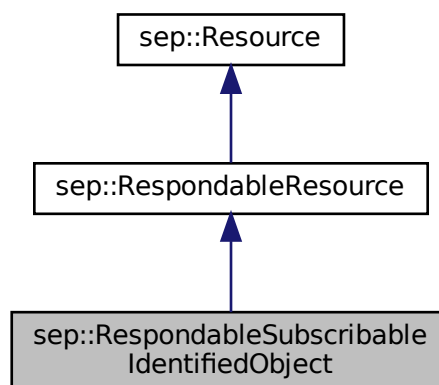
## 14.266 sep::ResponsibleSubscribableIdentifiedObject Struct Reference

```
#include <responsible_subscribable_identified_object.hpp>
```

Inheritance diagram for sep::ResponsibleSubscribableIdentifiedObject:



Collaboration diagram for sep::ResponsibleSubscribableIdentifiedObject:



## Public Attributes

- mRIDType **mrid**

- boost::optional< String32 > **description**
- boost::optional< VersionType > **version**
- SubscribableType **subscribable**

## Additional Inherited Members

### 14.266.1 Detailed Description

An [IdentifiedObject](#) to which a [Response](#) can be requested.

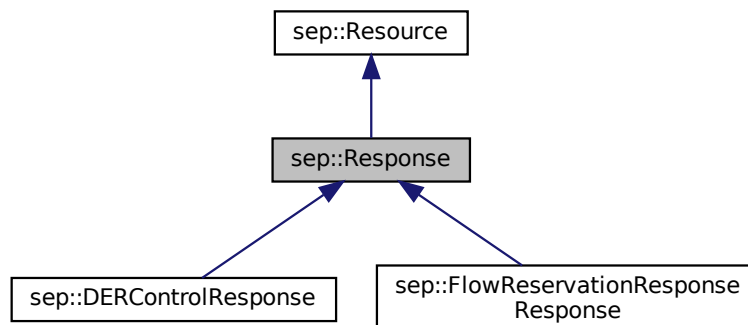
The documentation for this struct was generated from the following file:

- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/responsible\_subscribable\_identified\_object.hpp

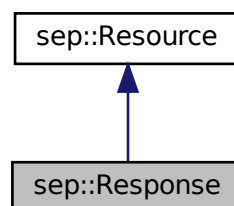
## 14.267 sep::Response Struct Reference

```
#include <response.hpp>
```

Inheritance diagram for sep::Response:



Collaboration diagram for sep::Response:



## Public Types

- enum class **Status** : UInt8 {
 **kEventReceived** = 1 , **kEventStarted** = 2 , **kEventComplete** = 3 , **kOptOut** = 4 ,
 **kOptIn** = 5 , **kCancelled** = 6 , **kSuperseded** = 7 , **kPartiallyCompletedOptOut** = 8 ,
 **kPartiallyCompletedOptIn** = 9 , **kEventCompleteNoParticipation** = 10 , **kEventAcknowledged** = 11 , **kCannotBeDisplayed** = 12 ,
 **kEventAbortedAlternateServerEvent** = 13 , **kEventAbortedAlternateProgramEvent** = 14 , **kRejectedParameterNA** = 252 , **kRejectedInvalidEvent** = 253 ,
 **kRejectedExpired** = 254 }

## Public Attributes

- HexBinary160 **end\_device\_ifdi**
- mRIDType **subject**
- boost::optional< Status > **status**
- boost::optional< TimeType > **created\_date\_time**

### 14.267.1 Detailed Description

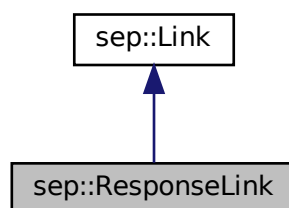
The [Response](#) object is the generic response data repository which is extended for specific function sets.

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

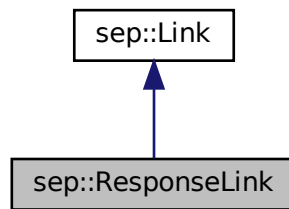
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/response.hpp

## 14.268 sep::ResponseLink Struct Reference

Inheritance diagram for sep::ResponseLink:



Collaboration diagram for sep::ResponseLink:



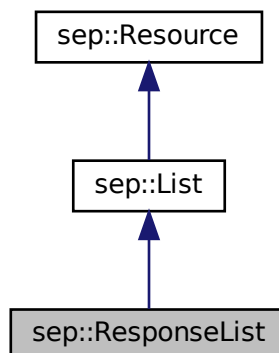
### Additional Inherited Members

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

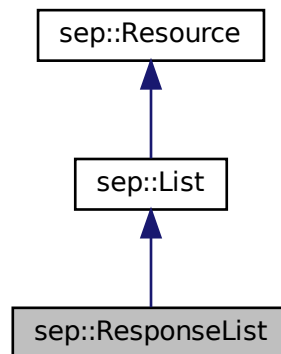
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response.hpp

## 14.269 sep::ResponseList Struct Reference

Inheritance diagram for sep::ResponseList:



Collaboration diagram for sep::ResponseList:



### Public Attributes

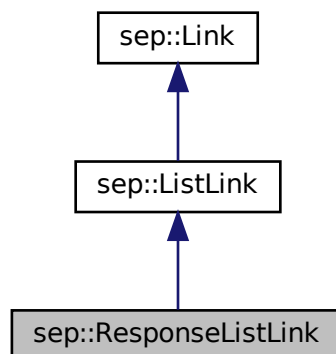
- `std::vector< Response > responses`

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

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response.hpp`

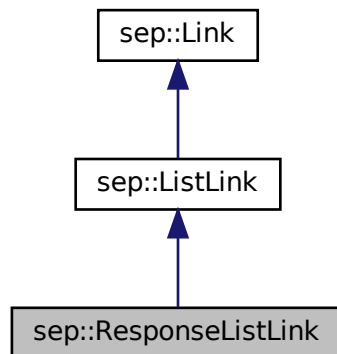
## 14.270 sep::ResponseListLink Struct Reference

Inheritance diagram for sep::ResponseListLink:





Collaboration diagram for sep::ResponseListLink:



### Additional Inherited Members

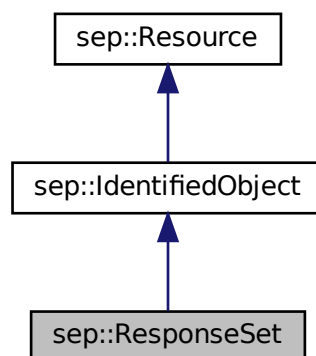
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response.hpp

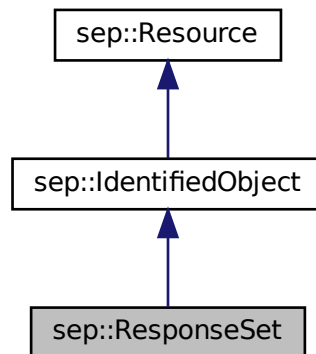
## 14.271 sep::ResponseSet Struct Reference

```
#include <response_set.hpp>
```

Inheritance diagram for sep::ResponseSet:



Collaboration diagram for sep::ResponseSet:



### Public Attributes

- boost::optional< [ResponseListLink](#) > response\_list\_link

#### 14.271.1 Detailed Description

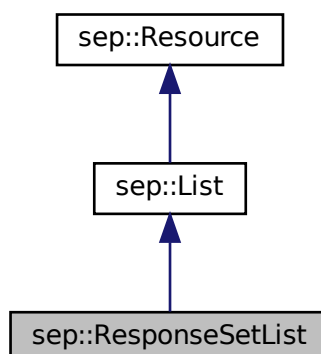
The [Response](#) object is the generic response data repository which is extended for specific function sets.

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

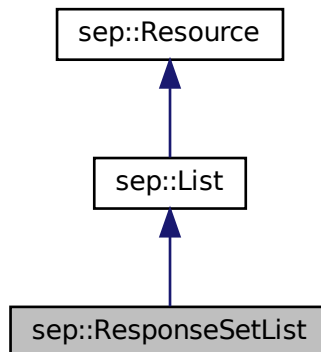
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response\_set.hpp

## 14.272 sep::ResponseSetList Struct Reference

Inheritance diagram for sep::ResponseSetList:



Collaboration diagram for sep::ResponseSetList:



### Public Attributes

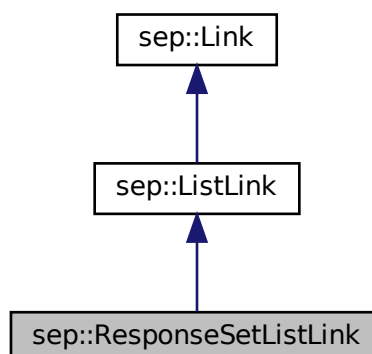
- `std::vector< ResponseSet > response_sets`
- `UInt32 poll_rate`

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

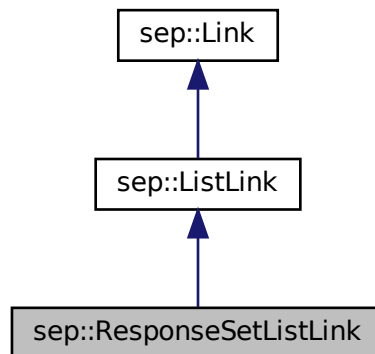
- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/response_set.hpp`

## 14.273 sep::ResponseSetListLink Struct Reference

Inheritance diagram for sep::ResponseSetListLink:



Collaboration diagram for sep::ResponseSetListLink:



### Additional Inherited Members

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

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/response\_set.hpp

## 14.274 ecs::simulator::waterheater::Schedule Struct Reference

### Public Attributes

- size\_t **current\_index**
- std::vector< [Event](#) > **events**

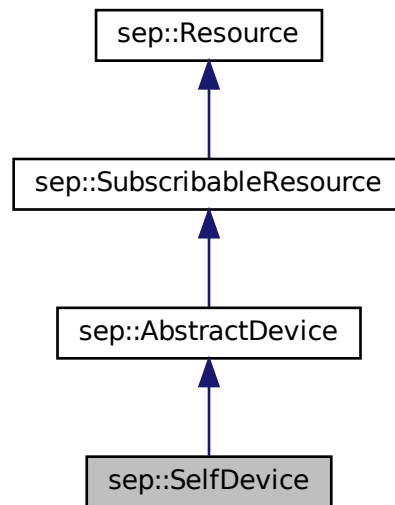
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp

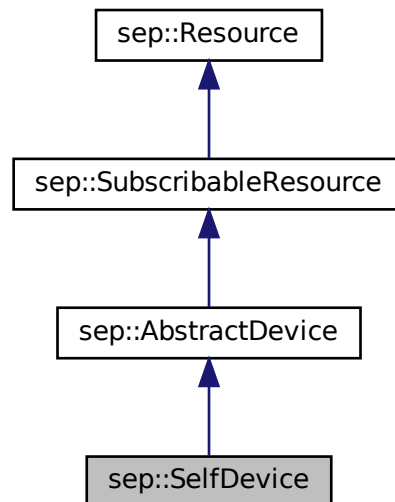
## 14.275 sep::SelfDevice Struct Reference

```
#include <self_device.hpp>
```

Inheritance diagram for sep::SelfDevice:



Collaboration diagram for sep::SelfDevice:



## Public Attributes

- UInt32 **poll\_rate** = 900

### 14.275.1 Detailed Description

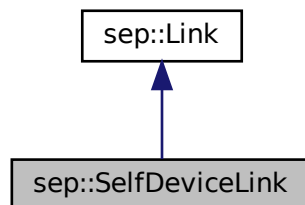
The [EndDevice](#) providing the resources available within the DeviceCapabilities.

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

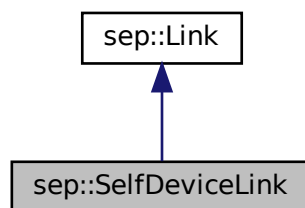
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/self\_device.hpp

## 14.276 sep::SelfDeviceLink Struct Reference

Inheritance diagram for sep::SelfDeviceLink:



Collaboration diagram for sep::SelfDeviceLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/self\_device.hpp

## 14.277 SendLambda< Stream > Struct Template Reference

### Public Member Functions

- **SendLambda** (Stream &stream, bool &close, beast::error\_code &ec)
- `template<bool isRequest, class Body, class Fields >`  
void **operator()** (http::message< isRequest, Body, Fields > &&msg) const

### Public Attributes

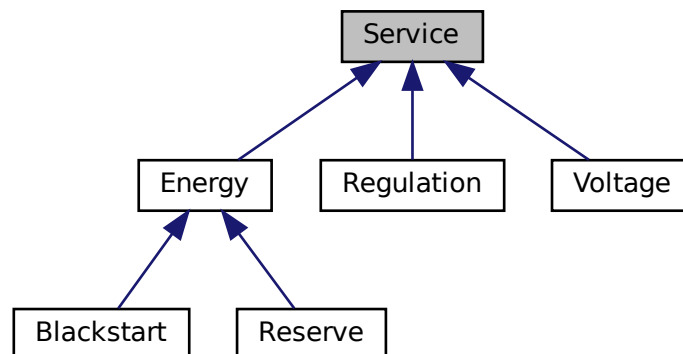
- Stream & **stream\_**
- bool & **close\_**
- beast::error\_code & **ec\_**

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

- /home/tylor/dev/does-egot-system/libs/https/server/include/https/server/send\_lambda.hpp

## 14.278 Service Struct Reference

Inheritance diagram for Service:



### Public Attributes

- std::string **group\_id**
- std::string **name**
- std::string **type**
- uint64\_t **start\_time**
- uint64\_t **interval\_start**
- uint64\_t **interval\_duration**

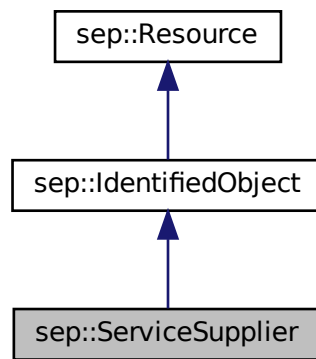
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/apps/simple/src/main.cpp

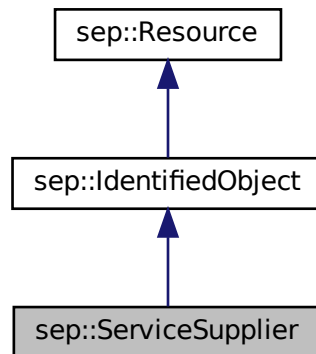
## 14.279 sep::ServiceSupplier Struct Reference

```
#include <service_supplier.hpp>
```

Inheritance diagram for sep::ServiceSupplier:



Collaboration diagram for sep::ServiceSupplier:



### Public Attributes

- String32 **email**
- String20 **phone**
- UInt32 **provider\_id**
- String42 **web**



### 14.279.1 Detailed Description

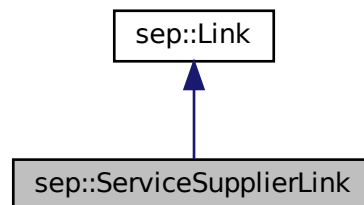
Organisation that provides services to Customers.

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

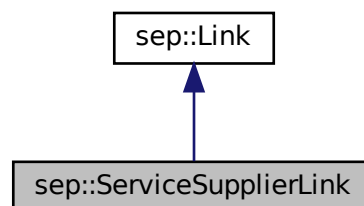
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/service\_supplier.hpp

### 14.280 sep::ServiceSupplierLink Struct Reference

Inheritance diagram for sep::ServiceSupplierLink:



Collaboration diagram for sep::ServiceSupplierLink:



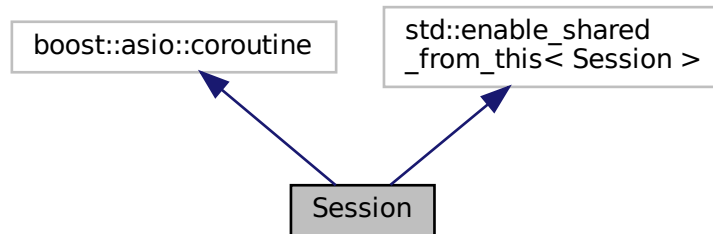
### Additional Inherited Members

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

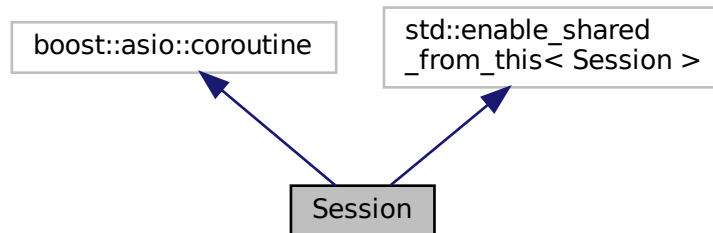
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/service\_supplier.hpp

## 14.281 Session Class Reference

Inheritance diagram for Session:



Collaboration diagram for Session:



### Public Member Functions

- **Session** (boost::asio::ip::tcp::socket &&socket, boost::asio::ssl::context &ctx, std::shared\_ptr< std::string const > const &doc\_root)
- void **run** ()
- bool **IDVerifyCallback** (bool preverified, boost::asio::ssl::verify\_context &ctx)
- void **fail** (boost::beast::error\_code ec, char const \*what)
- void **loop** (beast::error\_code ec, std::size\_t bytes\_transferred, bool close)

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

- /home/tylor/dev/does-egot-system/libs/https/server/include/https/server/session.hpp

## 14.282 sep::SetPoint Struct Reference

```
#include <set_point.hpp>
```

### Public Attributes

- UInt16 **cooling\_set\_point**
- UInt16 **heating\_set\_point**

### 14.282.1 Detailed Description

The [SetPoint](#) object is used to apply specific temperature set points to a temperature control device. The values of the heatingSetpoint and coolingSetpoint attributes SHALL be calculated as follows:

Cooling/Heating [Temperature](#) Set Point / 100 = temperature in degrees Celsius where  $-273.15^{\circ}\text{C} \leq \text{temperature} \leq 327.67^{\circ}\text{C}$ , corresponding to a Cooling and/or Heating [Temperature](#) Set Point. The maximum resolution this format allows is 0.01 °C.

The field not present in a [Response](#) indicates that this field has not been used by the end device. If a temperature is sent that exceeds the temperature limit boundaries that are programmed into the device, the device SHALL respond by setting the temperature at the limit.

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

- /home/taylor/dev/dae-egot-system/libs/sep/models/include/sep/models/set\_point.hpp

## 14.283 sep::SignedRealEnergy Struct Reference

```
#include <signed_real_energy.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- Int48 **value**

### 14.283.1 Detailed Description

Real electrical energy, signed

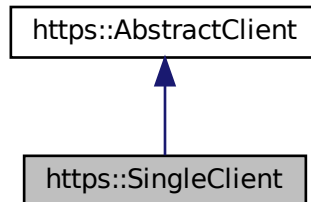
The documentation for this struct was generated from the following file:

- /home/taylor/dev/dae-egot-system/libs/sep/models/include/sep/models/signed\_real\_energy.hpp

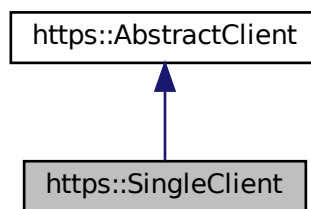
## 14.284 https::SingleClient Class Reference

```
#include <single_client.hpp>
```

Inheritance diagram for https::SingleClient:



Collaboration diagram for https::SingleClient:



### Public Member Functions

- **SingleClient** ([SingleClient](#) &other)=delete
- void **operator=** (const [SingleClient](#) &)=delete
- sep::HexBinary160 **getLFDI** () override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Get** (const std::string &target, const std::string &query="") override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Post** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Put** (const std::string &target, const std::string &resource) override
- boost::beast::http::response< boost::beast::http::dynamic\_body > **Delete** (const std::string &target) override

### Static Public Member Functions

- static [SingleClient](#) & **getInstance** (const [Context](#) &context={"", "", "", ""})

## Protected Member Functions

- **SingleClient** (const [Context](#) &context)

### 14.284.1 Detailed Description

Singleton for http client that allows the application to query a preconfigured server from anywhere within the program

```
Context ctx;
ctx.id = 1;
ctx.root = ".";
ctx.address = "www.google.com";
ctx.port = 443;
ctx.id = 1;
SingleClient::getInstance(ctx).Get("index.html");
// then every call after that can call without the context
SingleClient::getInstance().Get("index.html")
```

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

- /home/tylor/dev/does-egot-system/libs/https/client/include/https/client/single\_client.hpp
- /home/tylor/dev/does-egot-system/libs/https/client/src/single\_client.cpp

## 14.285 sep::StateOfChargeStatusType Struct Reference

### Public Attributes

- TimeType **date\_time**
- PerCent **value**

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/state\_of\_charge\_status\_type.hpp

## 14.286 sep::StorageModeStatusType Struct Reference

### Public Types

- enum class **Status** : UInt8 { **kCharging** , **kDischarging** , **kHolding** }

### Public Attributes

- TimeType **date\_time**
- Status **value**

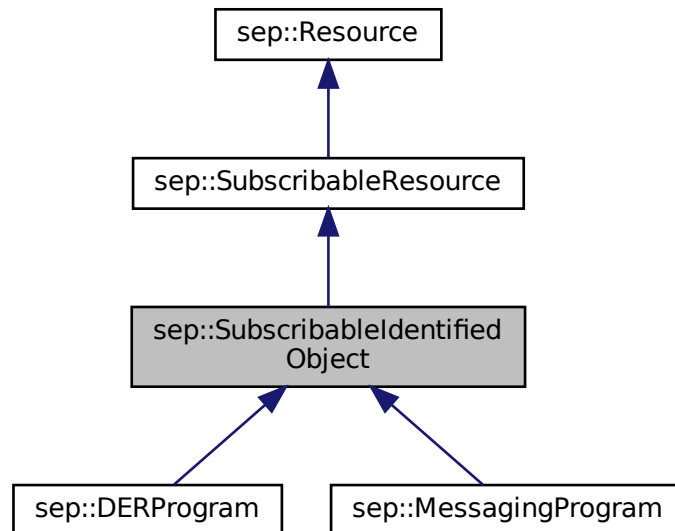
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/storage\_mode\_status\_type.hpp

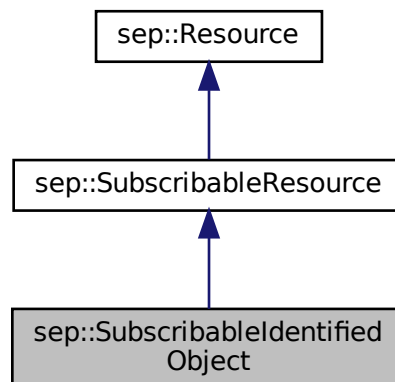
## 14.287 sep::SubscribableIdentifiedObject Struct Reference

```
#include <subscribable_identified_object.hpp>
```

Inheritance diagram for sep::SubscribableIdentifiedObject:



Collaboration diagram for sep::SubscribableIdentifiedObject:



### Public Attributes

- mRIDType **mrid**
- std::string **description**
- VersionType **version**

### 14.287.1 Detailed Description

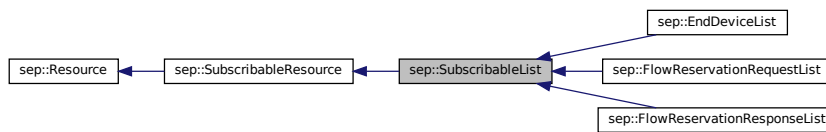
An [IdentifiedObject](#) to which a [Subscription](#) can be requested.

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

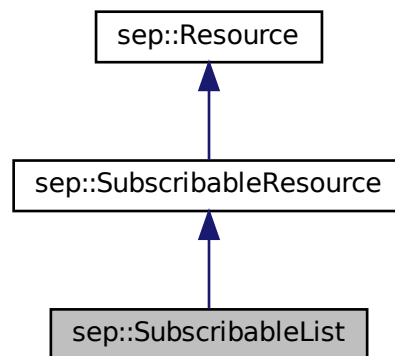
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscribable\_identified\_object.hpp

## 14.288 sep::SubscribableList Struct Reference

Inheritance diagram for sep::SubscribableList:



Collaboration diagram for sep::SubscribableList:



### Public Attributes

- UInt32 **all**
- UInt32 **results**

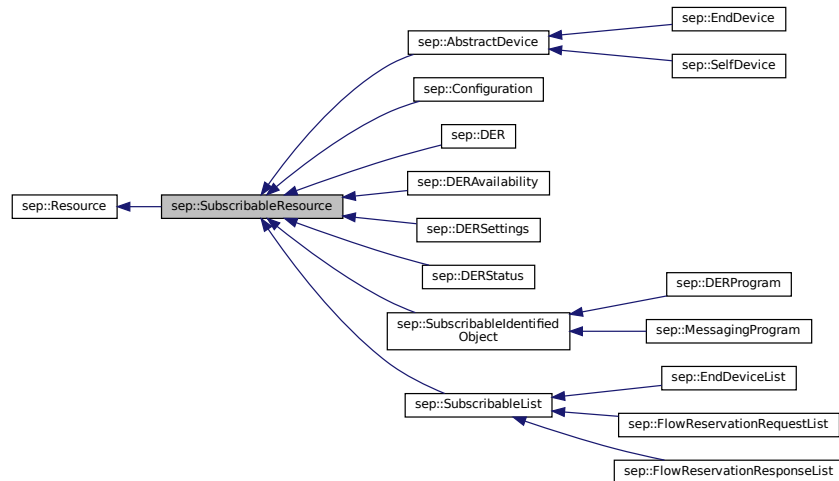
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscribable\_resource.hpp

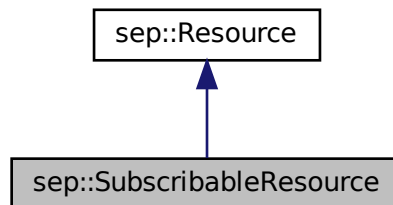
## 14.289 sep::SubscribableResource Struct Reference

```
#include <subscribable_resource.hpp>
```

Inheritance diagram for sep::SubscribableResource:



Collaboration diagram for sep::SubscribableResource:



### Public Attributes

- SubscribableType **subscribable**

### 14.289.1 Detailed Description

A [Resource](#) to which a [Subscription](#) can be requested.

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

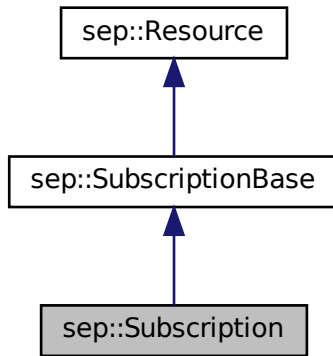
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscribable\_resource.hpp



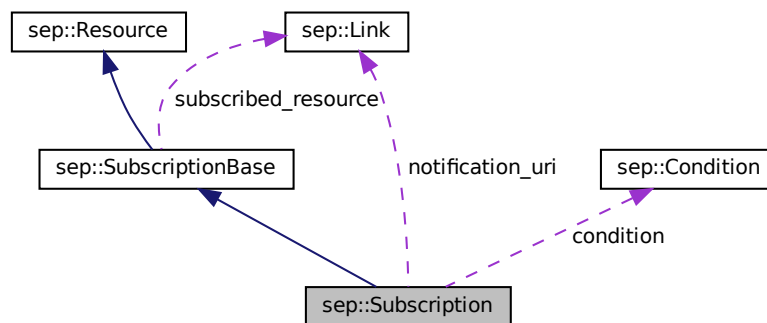
## 14.290 sep::Subscription Struct Reference

```
#include <subscription.hpp>
```

Inheritance diagram for sep::Subscription:



Collaboration diagram for sep::Subscription:



### Public Types

- enum class **Encoding** : UInt8 { **APPLICATION\_SEP\_XML** , **APPLICATION\_SEP\_EXI** }

### Public Attributes

- [Condition](#) **condition**
- Encoding **encoding**
- String16 **level**
- UInt32 **limit**
- [Link](#) **notification\_uri**

### 14.290.1 Detailed Description

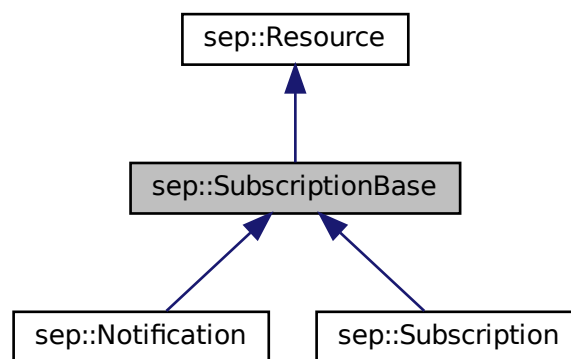
Holds the information related to a client subscription to receive updates to a resource automatically.

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

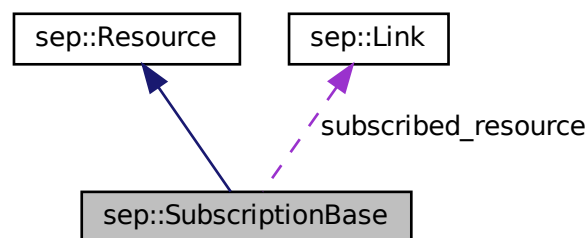
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscription.hpp

## 14.291 sep::SubscriptionBase Struct Reference

Inheritance diagram for sep::SubscriptionBase:



Collaboration diagram for sep::SubscriptionBase:



### Public Attributes

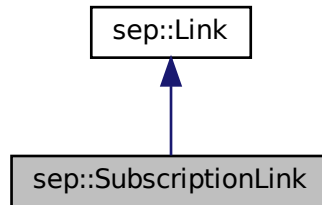
- [Link](#) subscribed\_resource

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

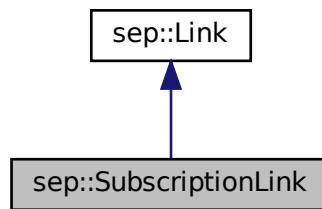
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscription.hpp

## 14.292 sep::SubscriptionLink Struct Reference

Inheritance diagram for sep::SubscriptionLink:



Collaboration diagram for sep::SubscriptionLink:



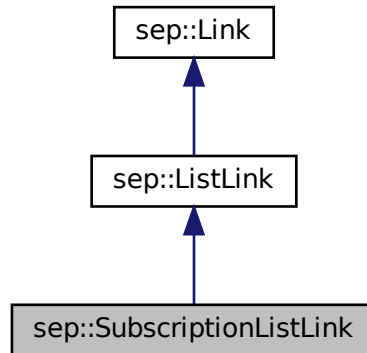
### Additional Inherited Members

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

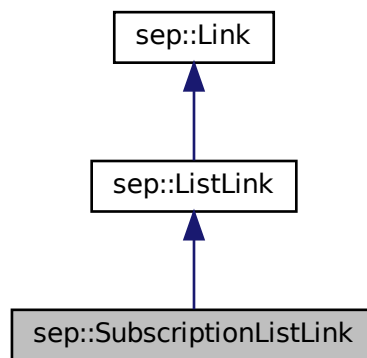
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/subscription.hpp

## 14.293 sep::SubscriptionListLink Struct Reference

Inheritance diagram for sep::SubscriptionListLink:



Collaboration diagram for sep::SubscriptionListLink:



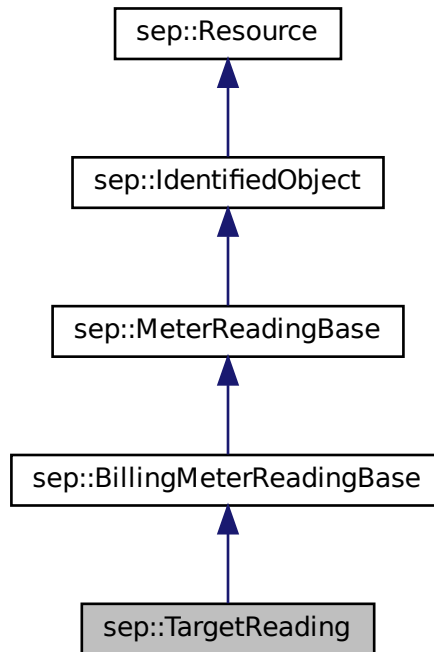
### Additional Inherited Members

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

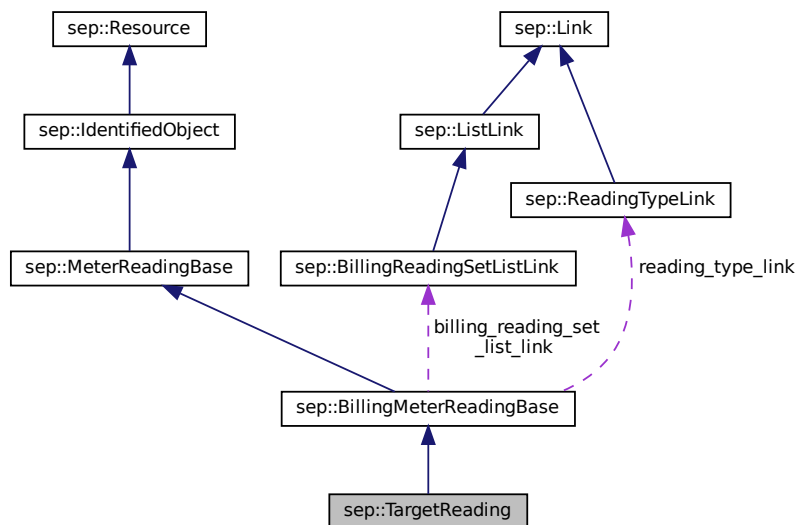
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/subscription.hpp

## 14.294 sep::TargetReading Struct Reference

Inheritance diagram for sep::TargetReading:



Collaboration diagram for sep::TargetReading:



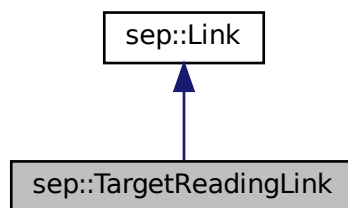
## Additional Inherited Members

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

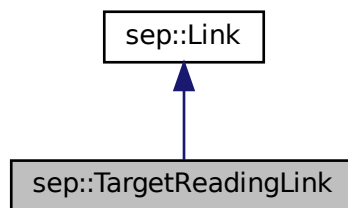
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.295 sep::TargetReadingLink Struct Reference

Inheritance diagram for sep::TargetReadingLink:



Collaboration diagram for sep::TargetReadingLink:



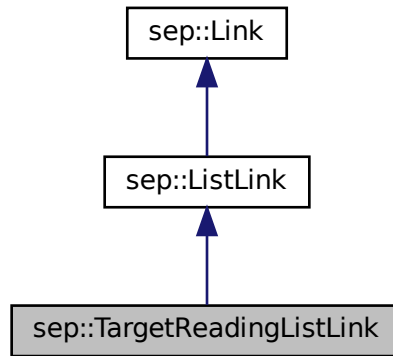
## Additional Inherited Members

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

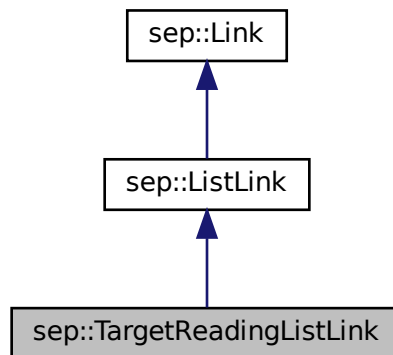
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.296 sep::TargetReadingListLink Struct Reference

Inheritance diagram for sep::TargetReadingListLink:



Collaboration diagram for sep::TargetReadingListLink:



### Additional Inherited Members

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/billing\_meter\_reading.hpp

## 14.297 sep::TargetReduction Struct Reference

```
#include <target_reduction.hpp>
```

## Public Attributes

- UnitType **unit\_type**
- UInt16 **value**

### 14.297.1 Detailed Description

The [TargetReduction](#) object is used by a Demand [Response](#) service provider to provide a RECOMMENDED threshold that a device/premises should maintain its consumption below.

For example, a service provider can provide a RECOMMENDED threshold of some kWh for a 3-hour event. This means that the device/premises would maintain its consumption below the specified limit for the specified period.

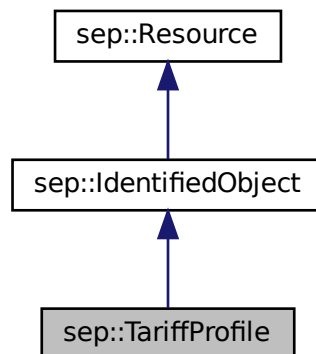
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/target\_reduction.hpp

## 14.298 sep::TariffProfile Struct Reference

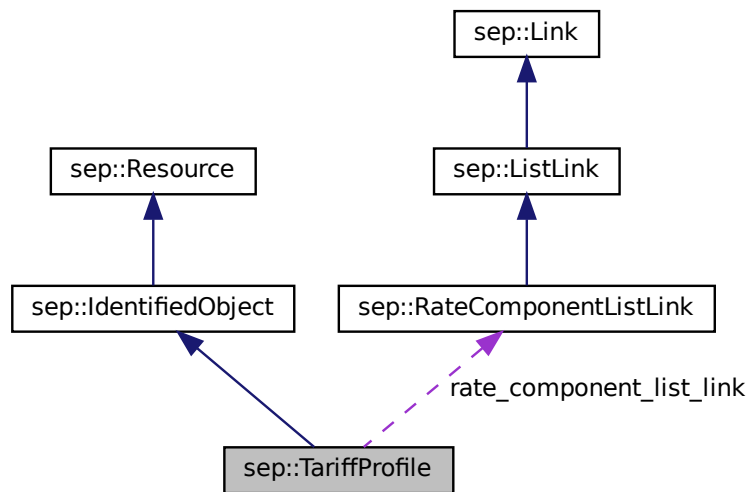
```
#include <tariff_profile.hpp>
```

Inheritance diagram for sep::TariffProfile:





Collaboration diagram for sep::TariffProfile:



## Public Attributes

- CurrencyCode **currency**
- PowerOfTenMultiplierType **price\_power\_of\_ten\_multiplier**
- PrimacyType **primacy**
- String20 **rate\_code**
- [RateComponentListLink](#) **rate\_component\_list\_link**
- ServiceKind **service\_category\_kind**

### 14.298.1 Detailed Description

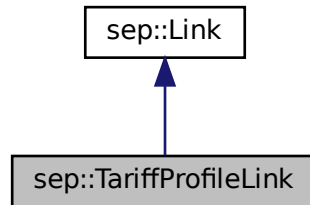
A schedule of charges; structure that allows the definition of tariff structures such as step (block) and time of use (tier) when used in conjunction with [TimeTariffInterval](#) and [ConsumptionTariffInterval](#).

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

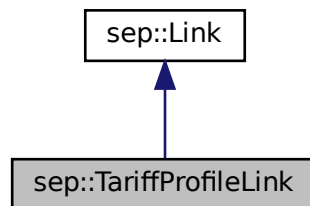
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/tariff\_profile.hpp

## 14.299 sep::TariffProfileLink Struct Reference

Inheritance diagram for sep::TariffProfileLink:



Collaboration diagram for sep::TariffProfileLink:



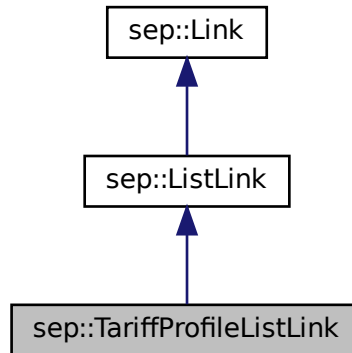
### Additional Inherited Members

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

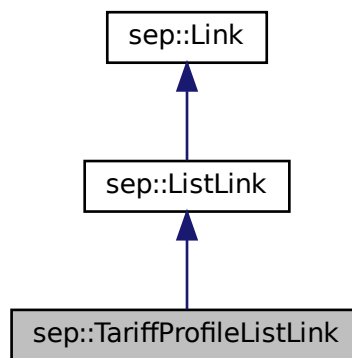
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/tariff\_profile.hpp

## 14.300 sep::TariffProfileListLink Struct Reference

Inheritance diagram for sep::TariffProfileListLink:



Collaboration diagram for sep::TariffProfileListLink:



### Additional Inherited Members

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

- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/tariff_profile.hpp`

## 14.301 ecs::simulator::waterheater::Temperature Struct Reference

### Public Attributes

- float **fahrenheit**

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

- /home/tylor/dev/doe-egot-system/libs/ecs/simulator/include/ecs/simulator/waterheater.hpp

## 14.302 sep::Temperature Struct Reference

```
#include <temperature.hpp>
```

### Public Types

- enum class **Subject** : UInt8 { **Enclosure** , **Transformer** , **HeatSink** }

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- Subject **subject**
- UInt16 **value**

### 14.302.1 Detailed Description

Specification of a temperature.

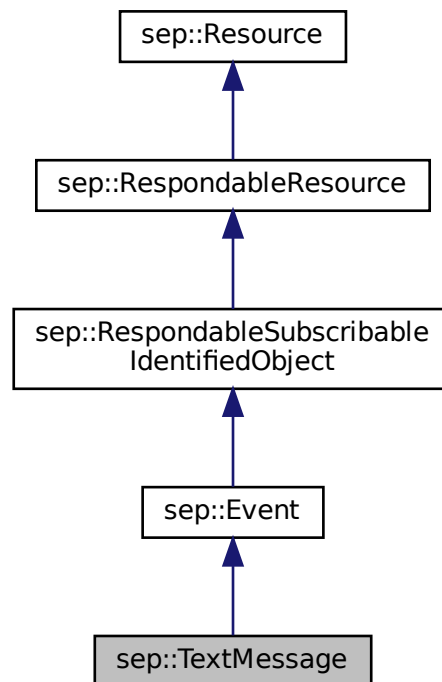
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/temperature.hpp

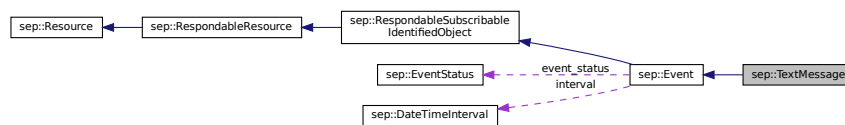
### 14.303 sep::TextMessage Struct Reference

```
#include <text_message.hpp>
```

Inheritance diagram for sep::TextMessage:



Collaboration diagram for sep::TextMessage:



#### Public Attributes

- String20 **originator**
- PriorityType **priority**
- std::string **text\_message**

## Additional Inherited Members

### 14.303.1 Detailed Description

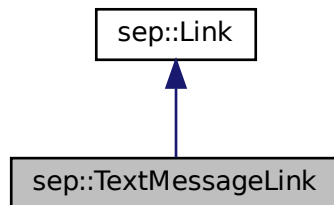
Text message such as a notification.

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

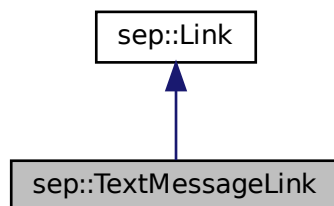
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/text\_message.hpp

## 14.304 sep::TextMessageLink Struct Reference

Inheritance diagram for sep::TextMessageLink:



Collaboration diagram for sep::TextMessageLink:



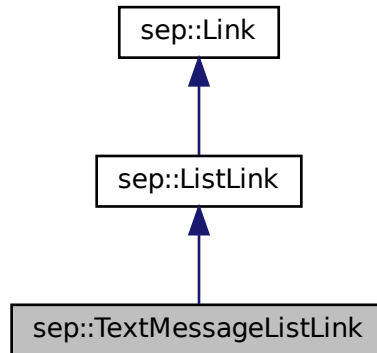
## Additional Inherited Members

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

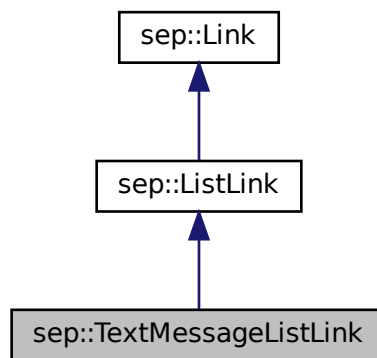
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/text\_message.hpp

## 14.305 sep::TextMessageListLink Struct Reference

Inheritance diagram for sep::TextMessageListLink:



Collaboration diagram for sep::TextMessageListLink:



### Additional Inherited Members

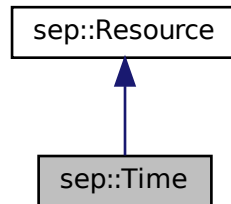
The documentation for this struct was generated from the following file:

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/text\_message.hpp

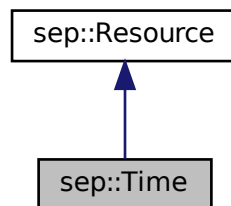
## 14.306 sep::Time Struct Reference

```
#include <time.hpp>
```

Inheritance diagram for sep::Time:



Collaboration diagram for sep::Time:



### Public Attributes

- TimeType **current\_time**
- TimeType **dst\_end\_time**
- TimeOffsetType **dst\_offset**
- TimeType **dst\_start\_time**
- UInt8 **quality**
- TimeOffsetType **tz\_offset**
- UInt32 **poll\_rate** = 900
- boost::optional< TimeType > **local\_time**

### 14.306.1 Detailed Description

Contains the representation of time, constantly updated.

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

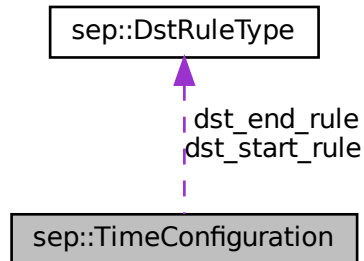
- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/time.hpp



## 14.307 sep::TimeConfiguration Struct Reference

```
#include <time_configuration.hpp>
```

Collaboration diagram for sep::TimeConfiguration:



### Public Attributes

- [DstRuleType](#) `dst_end_rule`
- [TimeOffsetType](#) `dst_offset`
- [DstRuleType](#) `dst_start_rule`
- [TimeOffsetType](#) `tz_offset`

### 14.307.1 Detailed Description

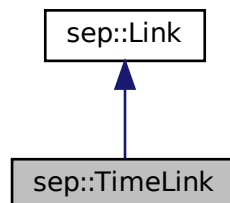
Contains attributes related to the configuration of the time service.

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

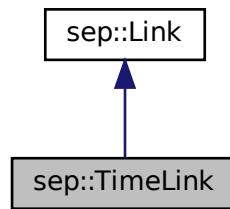
- `/home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/time_configuration.hpp`

## 14.308 sep::TimeLink Struct Reference

Inheritance diagram for sep::TimeLink:



Collaboration diagram for sep::TimeLink:



### Additional Inherited Members

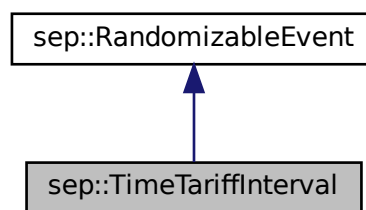
The documentation for this struct was generated from the following file:

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/time.hpp

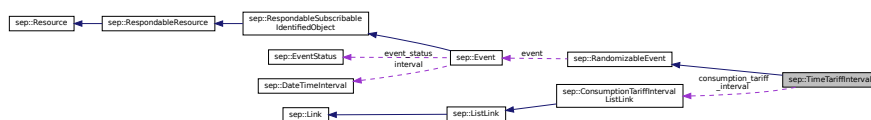
## 14.309 sep::TimeTariffInterval Struct Reference

```
#include <time_tariff_interval.hpp>
```

Inheritance diagram for sep::TimeTariffInterval:



Collaboration diagram for sep::TimeTariffInterval:



## Public Attributes

- [ConsumptionTariffIntervalListLink](#) `consumption_tariff_interval`
- TOUType `tou_tier`

### 14.309.1 Detailed Description

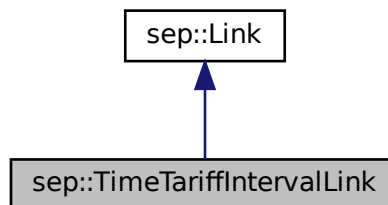
Describes the time-differentiated portion of the [RateComponent](#), if applicable, and provides the ability to specify multiple time intervals, each with its own consumption-based components and other attributes.

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

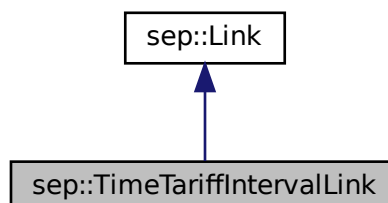
- `/home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/time_tariff_interval.hpp`

## 14.310 `sep::TimeTariffIntervalLink` Struct Reference

Inheritance diagram for `sep::TimeTariffIntervalLink`:



Collaboration diagram for `sep::TimeTariffIntervalLink`:



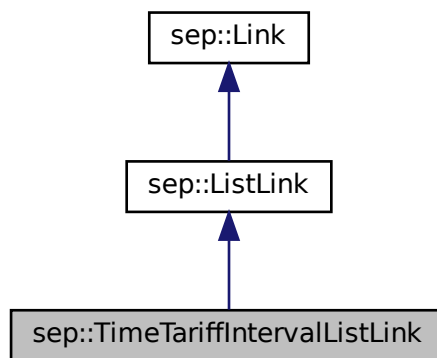
## Additional Inherited Members

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

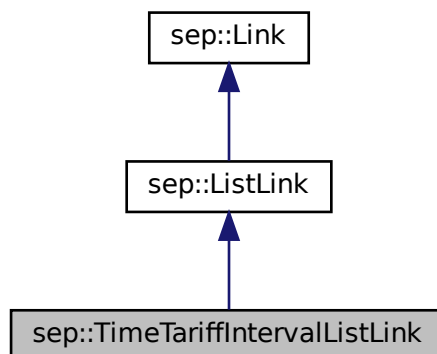
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/time\_tariff\_interval.hpp

## 14.311 sep::TimeTariffIntervalListLink Struct Reference

Inheritance diagram for sep::TimeTariffIntervalListLink:



Collaboration diagram for sep::TimeTariffIntervalListLink:



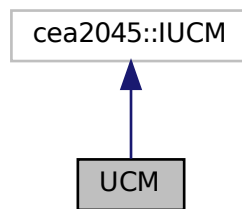
## Additional Inherited Members

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

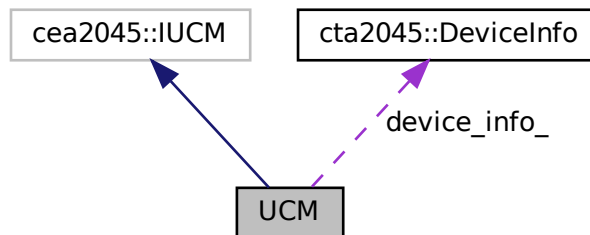
- /home/taylor/dev/does-egot-system/libs/sep/models/include/sep/models/time\_tariff\_interval.hpp

## 14.312 UCM Class Reference

Inheritance diagram for UCM:



Collaboration diagram for UCM:



## Public Member Functions

- virtual bool **isMessageTypeSupported** (cea2045::MessageTypeCode type\_code)
- virtual cea2045::MaxPayloadLengthCode **getMaxPayload** ()
- virtual void **processMaxPayloadResponse** (cea2045::MaxPayloadLengthCode payload)
- virtual void **processDeviceInfoResponse** (cea2045::cea2045DeviceInfoResponse \*message)
- virtual void **processCommodityResponse** (cea2045::cea2045CommodityResponse \*message)
- virtual void **processSetEnergyPriceResponse** (cea2045::cea2045IntermediateResponse \*message)

- virtual void **processSetTemperatureOffsetResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetTemperatureOffsetResponse** (cea2045::cea2045GetTemperateOffsetResponse \*message)
- virtual void **processSetSetpointsResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetSetpointsResponse** (cea2045::cea2045GetSetpointsResponse1 \*message)
- virtual void **processGetSetpointsResponse** (cea2045::cea2045GetSetpointsResponse2 \*message)
- virtual void **processStartCyclingResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processTerminateCyclingResponse** (cea2045::cea2045IntermediateResponse \*message)
- virtual void **processGetPresentTemperatureResponse** (cea2045::cea2045GetPresentTemperatureResponse \*message)
- virtual void **processGetUTCTimeResponse** (cea2045::cea2045GetUTCTimeResponse \*message)
- virtual void **processAckReceived** (cea2045::MessageCode code)
- virtual void **processNakReceived** (cea2045::LinkLayerNakCode nak, cea2045::MessageCode code)
- virtual void **processAppAckReceived** (cea2045::cea2045Basic \*message)
- virtual void **processAppNakReceived** (cea2045::cea2045Basic \*message)
- virtual void **processOperationalStateReceived** (cea2045::cea2045Basic \*message)
- virtual void **processAppCustomerOverride** (cea2045::cea2045Basic \*message)
- virtual void **processIncompleteMessage** (const unsigned char \*buffer, unsigned int byte\_count)

## Public Attributes

- cea2045::MaxPayloadLengthCode **max\_payload\_**
- [cta2045::DeviceInfo](#) **device\_info\_**
- cta2045::commodity\_map **commodities\_**
- cea2045::cea2045GetTemperateOffsetResponse **temperature\_offset\_**
- cea2045::cea2045GetSetpointsResponse1 **setpoint\_1\_**
- cea2045::cea2045GetSetpointsResponse2 **setpoint\_2\_**
- cea2045::cea2045GetPresentTemperatureResponse **present\_temperature\_**
- cea2045::cea2045GetUTCTimeResponse **utc\_time\_**

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

- /home/tylor/dev/doe-egot-system/libs/cta2045/include/cta2045/ucm.hpp
- /home/tylor/dev/doe-egot-system/libs/cta2045/src/ucm.cpp

## 14.313 sep::UnitValueType Struct Reference

```
#include <unit_value_type.hpp>
```

## Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UomType **unit**
- Int32 **value**

### 14.313.1 Detailed Description

Type for specification of a specific value, with units and power of ten multiplier.

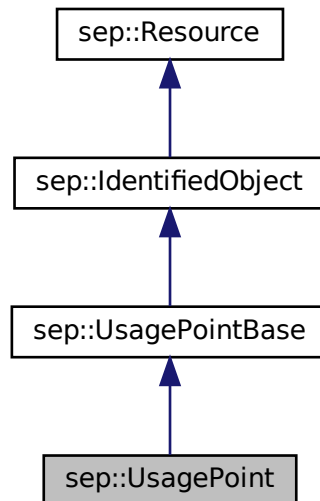
The documentation for this struct was generated from the following file:

- /home/tylor/dev/dae-egot-system/libs/sep/models/include/sep/models/unit\_value\_type.hpp

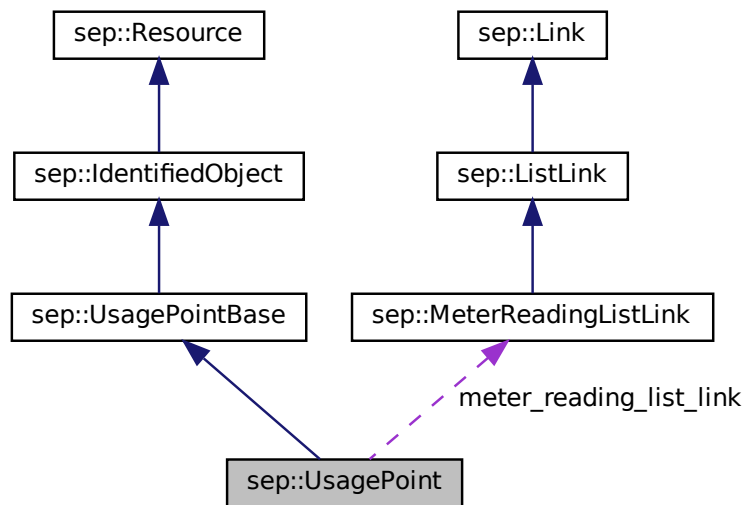
### 14.314 sep::UsagePoint Struct Reference

```
#include <usage_point_base.hpp>
```

Inheritance diagram for sep::UsagePoint:



Collaboration diagram for sep::UsagePoint:



## Public Attributes

- HexBinary160 **device\_ifdi**
- [MeterReadingListLink](#) **meter\_reading\_list\_link**

## Additional Inherited Members

### 14.314.1 Detailed Description

Logical point on a network at which consumption or production is either physically measured (e.g. metered) or estimated (e.g. unmetered street lights).

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

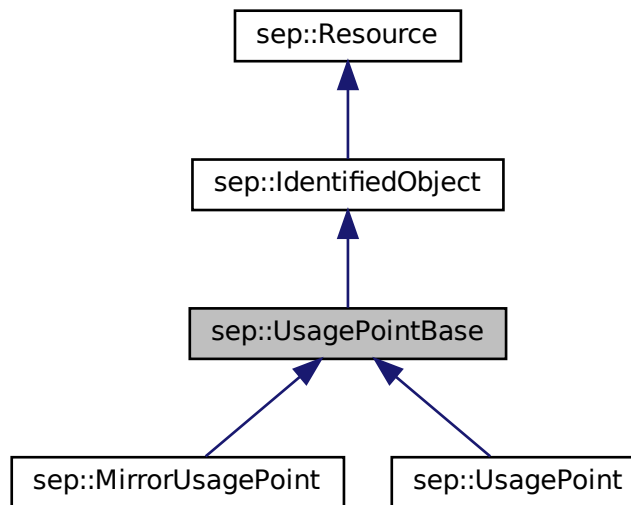
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/usage\_point\_base.hpp

## 14.315 sep::UsagePointBase Struct Reference

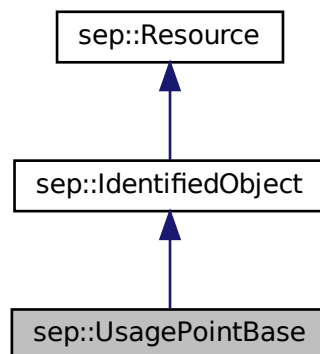
```
#include <usage_point_base.hpp>
```



Inheritance diagram for sep::UsagePointBase:



Collaboration diagram for sep::UsagePointBase:



## Public Types

- enum class **Status** : UInt8 { **kOff** , **kOn** }

## Public Attributes

- RoleFlagsType **role\_flags**
- ServiceKind **service\_category\_kind**
- Status **status**

### 14.315.1 Detailed Description

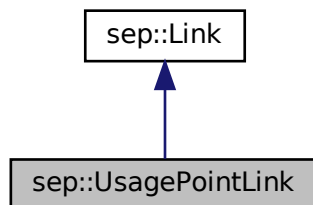
Logical point on a network at which consumption or production is either physically measured (e.g. metered) or estimated (e.g. unmetered street lights). A container for associating [ReadingType](#), Readings and ReadingSets.

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

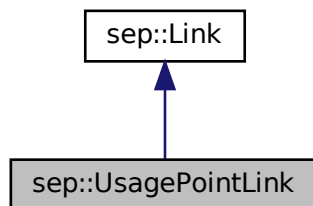
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/usage\_point\_base.hpp

## 14.316 sep::UsagePointLink Struct Reference

Inheritance diagram for sep::UsagePointLink:



Collaboration diagram for sep::UsagePointLink:



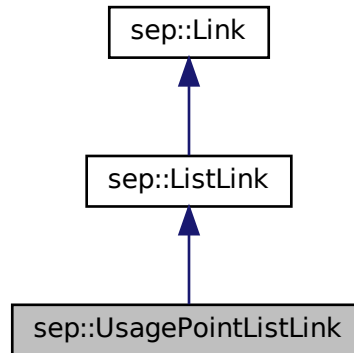
### Additional Inherited Members

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

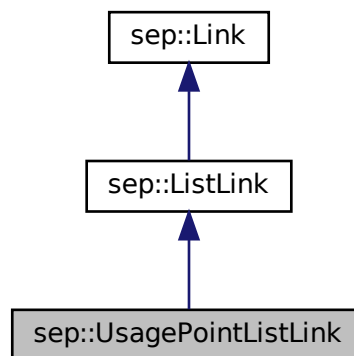
- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/usage\_point\_base.hpp

## 14.317 sep::UsagePointListLink Struct Reference

Inheritance diagram for sep::UsagePointListLink:



Collaboration diagram for sep::UsagePointListLink:



### Additional Inherited Members

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

- /home/tylor/dev/doe-egot-system/libs/sep/models/include/sep/models/usage\_point\_base.hpp

## 14.318 sep::VersionInformation Struct Reference

### Public Attributes

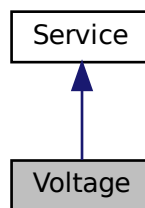
- std::string **default\_namespace**
- std::string **element\_form\_default**
- std::string **schema\_location**
- std::string **target\_namespace**
- std::string **trace\_id**
- std::string **version**

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

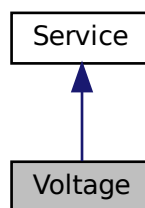
- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/version\_information.hpp

## 14.319 Voltage Struct Reference

Inheritance diagram for Voltage:



Collaboration diagram for Voltage:



## Public Attributes

- `std::unordered_map< double, double >` **curve**

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

- `/home/tylor/dev/does-egot-system/apps/simple/src/main.cpp`

## 14.320 sep::VoltageRMS Struct Reference

```
#include <voltage_rms.hpp>
```

## Public Attributes

- `PowerOfTenMultiplierType` **multiplier**
- `UInt16` **value**

### 14.320.1 Detailed Description

Average electric potential difference between two points.

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

- `/home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/voltage_rms.hpp`

## 14.321 sep::WADL Class Reference

```
#include <wadl.hpp>
```

## Public Member Functions

- `WADL (WADL &other)=delete`
- `void operator= (const WADL &)=delete`
- `WADLResource getResource (const std::string &uri)`

## Static Public Member Functions

- `static WADL * getInstance (const std::string &wadl_path)`

## Protected Member Functions

- `WADL (const std::string &wadl_path)`

### 14.321.1 Detailed Description

The [WADL](#) class is a convenience class to map server uri access and response status codes. A server can get all properties mapped to a specified uri and verify the current request to ensure alignment.

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

- /home/tylor/dev/does-egot-system/libs/sep/wadl/include/sep/wadl/wadl.hpp
- /home/tylor/dev/does-egot-system/libs/sep/wadl/src/wadl.cpp

## 14.322 sep::WADLResource Struct Reference

```
#include <wadl.hpp>
```

### Classes

- struct [Properties](#)

### Public Attributes

- uint16\_t **methods\_bit\_mask**
- std::unordered\_map< std::string, [Properties](#) > **properties**

### 14.322.1 Detailed Description

container for specified uri properties such as access control and response code

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

- /home/tylor/dev/does-egot-system/libs/sep/wadl/include/sep/wadl/wadl.hpp

## 14.323 sep::WattHour Struct Reference

```
#include <watt_hour.hpp>
```

### Public Attributes

- PowerOfTenMultiplierType **multiplier**
- UInt16 **value**

### 14.323.1 Detailed Description

Active (real) energy

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

- /home/tylor/dev/does-egot-system/libs/sep/models/include/sep/models/watt\_hour.hpp

## 14.324 ecs::server::World Class Reference

```
#include <world.hpp>
```

### Public Member Functions

- **World** ([World](#) &other)=delete
- void **operator=** (const [World](#) &)=delete
- std::string [Get](#) (const [Href](#) &href)
- std::string [Post](#) (const [Href](#) &href, const std::string &message)
- std::string [Put](#) (const [Href](#) &href, const std::string &message)
- void [Delete](#) (const [Href](#) &href)

### Static Public Member Functions

- static [World](#) \* [getInstance](#) ()

### Public Attributes

- flecs::world **world**

### 14.324.1 Detailed Description

Singleton ECS world to store all server resources

## 14.324.2 Member Function Documentation

### 14.324.2.1 Delete()

```
void World::Delete (  
    const Href & href )
```

Handle all HTTP Delete requests from clients

### 14.324.2.2 Get()

```
std::string World::Get (
    const Href & href )
```

Handle all HTTP Get requests from clients

### 14.324.2.3 getInstance()

```
World * World::getInstance ( ) [static]
```

get instance of the world

Note: this is not the best idea for a multi-threaded application, but it works for now

### 14.324.2.4 Post()

```
std::string World::Post (
    const Href & href,
    const std::string & message )
```

Handle all HTTP Post requests from clients

### 14.324.2.5 Put()

```
std::string World::Put (
    const Href & href,
    const std::string & message )
```

Handle all HTTP Put requests from clients

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

- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/include/ecs/server/sep/world.hpp
- /home/tylor/dev/does-egot-system/libs/ecs/server/sep/src/world.cpp

## 14.325 World Struct Reference

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

- /home/tylor/dev/does-egot-system/apps/simple/src/solar.cpp

## 14.326 XmlValidator Class Reference

```
#include <xml_validator.hpp>
```



## Public Member Functions

- **XmlValidator** (const std::string &xsd\_path)
- bool **ValidateXml** (const std::string &xml\_str)

### 14.326.1 Detailed Description

The [XmlValidator](#) is a utility class to validate xml based on the configured XML schema.

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

- /home/tylor/dev/does-egot-system/libs/sep/xml/include/sep/xml/xml\_validator.hpp
- /home/tylor/dev/does-egot-system/libs/sep/xml/src/xml\_validator.cpp

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