C++ Software transactional Memory

Zoltan Fuzesi

C00197361 IT Carlow

Software Engineering 2017/2018

STM library with client application

Code to develop the library

Contents

1 C++ Software Transactional Memory

File: TM.h Author: Zoltan Fuzesi C00197361, IT Carlow, Software Engineering,

Supervisor : Joe Kehoe,

C++ Software Transactional Memory,

Created on December 18, 2017, 2:09 PM Transaction Manager class fields and methods declarations

1.1 Object Based Software Transactional Memory.

OSTM is a polymorphic solution to store and manage shared memory spaces within c++ programming context. You can store and managed any kind of object in transactional environment as a shared and protected memory space, if your class inherited from the OSTM base class, and follows the required steps.

1.1.1 Installation of the Shared library on Linux platform.

Download the zip file from the provided (Windows, Linux, MAC OSX)link in the web-site, that contains the libostm.↩ so, TM.h, TX.h, OSTM.h files.Unzip the archive file to the desired destination possibly where you program is stored. Copy the library (Shared, Static) to the destination directory. Implement the inheritance from the base class. Create an executable, and run the application.

1.1.2 Step 1: Download the archive file.

Go to the website `Tutorial` and download the library to the required operating system platform. (Linux, Windows, Mac OSX)

1.1.3 Step 2: Unzip in to the target destination.

Unzip the downloaded rar file. You can find the Shared, Static library and the ∗.h files in the unzipped folder. Copy the ∗.h files to the same folder where is the other C++ files are stored.

1.1.4 Step 3: Copy the shared library.

The Shared library is a libostm.so file, that you need copy to the operating system directory where the other shared library are stored. It will be different destination folder on different platforms. (Linux, Windows, Mac OS) `More Information`

1.1.5 Step 4: Achieve the required class hierarchy.

To achieve the required class hierachy between the OSTM library and your own class structure, you need to implement few steps to inherite from the OSTM base class. Go to website `Tutorial` for more details. Details and instruction of class hierarchy requirements can be found on the web-site. www.serversite.info/ostm

1.1.6 Step 5: Create an executable file.

You can create an executable file using the provided Makefile as you linking together the library (libostm.so), and the ∗.h files with your own files.

1.1.7 Step 6: Transactional Environment.

Now your application use transactional environment, that guarantees the consistency between object transactions.

1.1.8 Step 7: Run the application.

Go to the directory where the executable was created, and used the following line in the terminal to run the application : ./EXECUTABLE_NAME

Abbreviation for bank names used in the test cases:
BOA - Bank of America
ULSTER - Ulster Bank
UNBL - United National Bank Limited
SWBPLC - Scottish Windows Bank PLC
AIB - Allied Irish Bank
BOI - Bank of Ireland

2 Hierarchical Index

2.1 Class Hierarchy

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

3 Class Index

3.1 Class List

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

4 File Index

4.1 File List

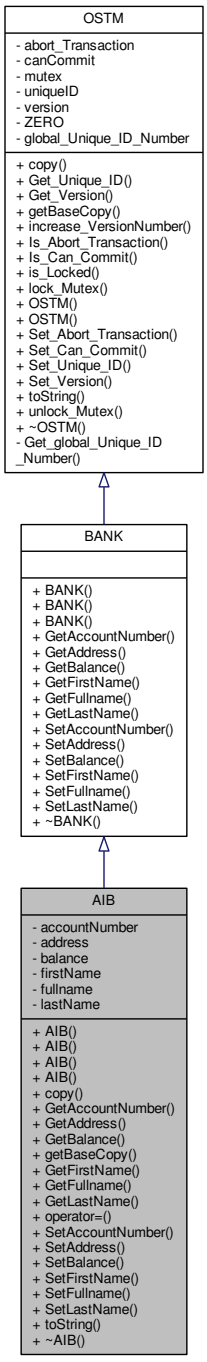
Here is a list of all files with brief descriptions:

5 Class Documentation

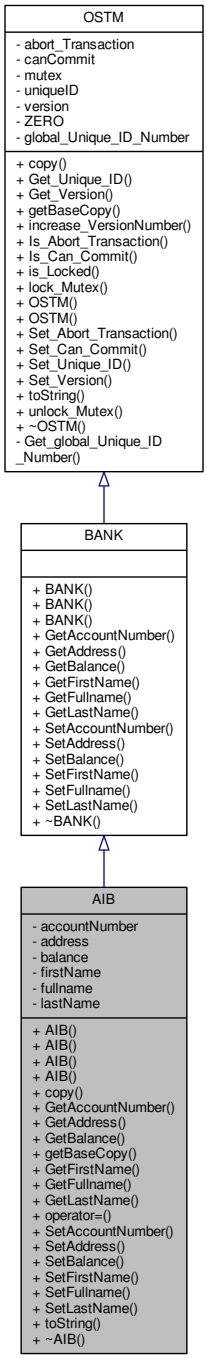
5.1 AIB Class Reference

```
#include <AIB.h>
```

Inheritance diagram for AIB:



Collaboration diagram for AIB:



Public Member Functions

- AIB ()
- AIB (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- AIB (std::shared_ptr< BANK > obj, int _version, int _unique_id)
- AIB (const AIB &orig)
- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

copy function, make deep copy of the object/pointer

- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- AIB operator= (const AIB &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~AIB ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.1.1 Detailed Description

Inherit from BANK

Definition at line 18 of file AIB.h.

5.1.2 Constructor & Destructor Documentation

5.1.2.1 AIB::AIB ( ) [inline]

Constructor

Definition at line 23 of file AIB.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by AIB(), and getBaseCopy().

```
00023           : BANK()
00024     {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031 
00032     };
```

5.1.2.2 AIB::AIB (int *accountNumber,* double *balance,* std::string *firstName,* std::string *lastName,* std::string *address*) [inline]

Custom constructor

Definition at line 36 of file AIB.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00036                                                                                           :
      BANK()
00037     {
00038         this->accountNumber = accountNumber;
00039         this->balance = balance;
00040         this->firstName = firstName;
00041         this->lastName = lastName;
00042         this->address = address;
00043         this->fullname = firstName + " " + lastName;
00044     };
```

5.1.2.3 AIB::AIB (std::shared_ptr< BANK > *obj,* int *_version,* int *_unique_id*) [inline]

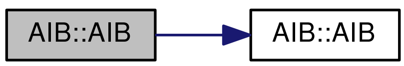
Custom constructor, used by the library for deep copying

Definition at line 48 of file AIB.h.

References accountNumber, address, AIB(), balance, firstName, fullname, and lastName.

```
00048                                                        : BANK(_version, _unique_id)
00049     {
00050
00051         this->accountNumber = obj->GetAccountNumber();
00052         this->balance = obj->GetBalance();
00053         this->firstName = obj->GetFirstName();
00054         this->lastName = obj->GetLastName();
00055         this->address = obj->GetAddress();
00056         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00057
00058     };
```

Here is the call graph for this function:



5.1.2.4 AIB::AIB (const AIB & *orig*)

Copy constructor

Definition at line 14 of file AIB.cpp.

```
00014                          {
00015 }
```

5.1.2.5 AIB::~AIB ( ) [virtual]

de-constructor

Definition at line 17 of file AIB.cpp.

Referenced by operator=().

```
00017           {
00018 }
```

5.1.3 Member Function Documentation

5.1.3.1 void AIB::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>
objFROM	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

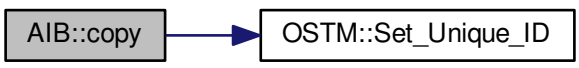
Definition at line 37 of file AIB.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00037                                                                   {
00038
00039     std::shared_ptr<AIB> objTO = std::dynamic_pointer_cast<AIB>(to);
00040     std::shared_ptr<AIB> objFROM = std::dynamic_pointer_cast<AIB>(from);
00041     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00042     objTO->Set_Version(objFROM->Get_Version());
00043     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00044     objTO->SetBalance(objFROM->GetBalance());
00045 }
```

Here is the call graph for this function:



5.1.3.2 int AIB::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 81 of file AIB.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00081                                {
00082     return accountNumber;
00083 }
```

5.1.3.3 std::string AIB::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 65 of file AIB.cpp.

References address.

Referenced by operator=().

```
00065                                {
00066     return address;
00067 }
```

5.1.3.4 double AIB::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 73 of file AIB.cpp.

References balance.

Referenced by operator=(), and toString().

```
00073                               {
00074     return balance;
00075 }
```

5.1.3.5 std::shared_ptr< OSTM > AIB::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a std::shared_ptr<BANK> return type

Reimplemented from OSTM.

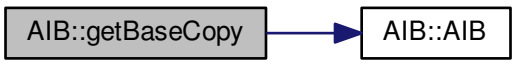
Definition at line 24 of file AIB.cpp.

References AIB().

Referenced by operator=().

```
00025 {
00026
00027     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00028     std::shared_ptr<BANK> obj(new AIB(objTO, object->Get_Version(),object->Get_Unique_ID()));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00030     return ostm_obj;
00031 }
```

Here is the call graph for this function:



5.1.3.6 std::string AIB::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 97 of file AIB.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00097                                  {
00098     return firstName;
00099 }
```

5.1.3.7 std::string AIB::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 105 of file AIB.cpp.

References fullname.

Referenced by operator=().

```
00105                                 {
00106     return fullname;
00107 }
```

5.1.3.8 std::string AIB::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 89 of file AIB.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00089                                   {
00090     return lastName;
00091 }
```

5.1.3.9 AIB AIB::operator= (const AIB & *orig*) [inline]

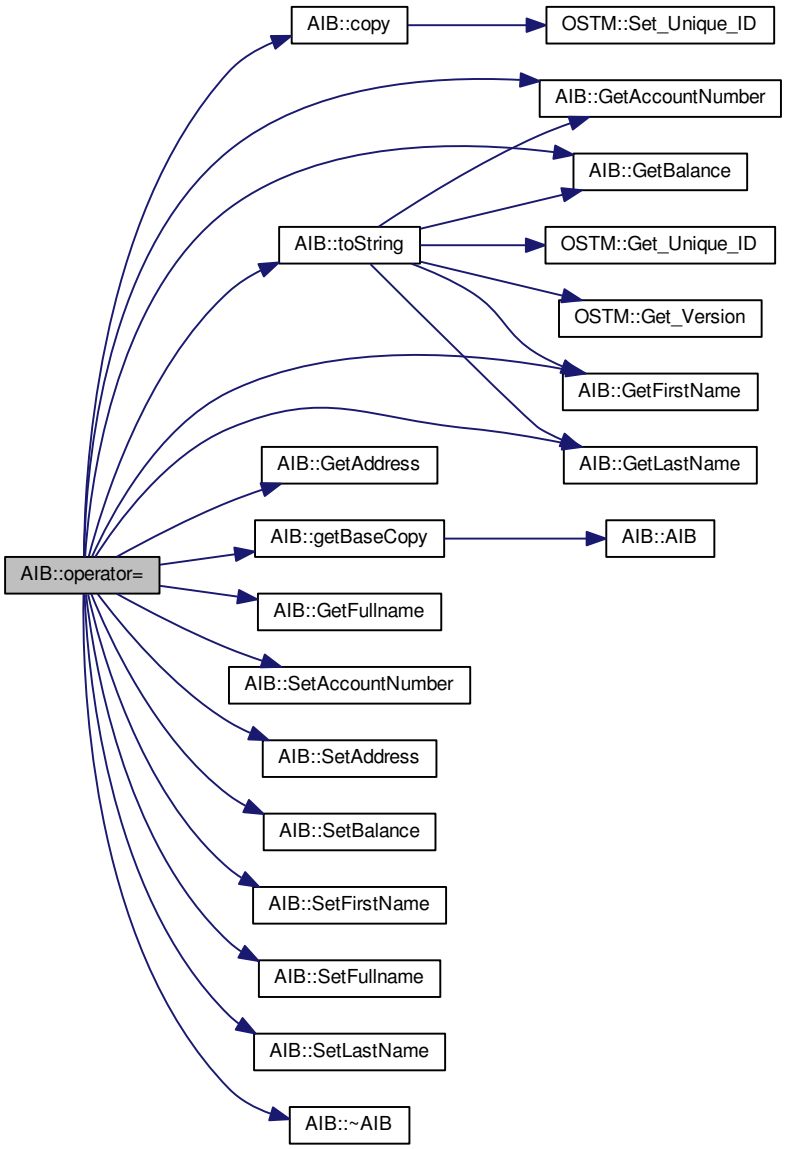
Operator

Definition at line 66 of file AIB.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~AIB().

```
00066 {};
```

Here is the call graph for this function:



5.1.3.10 void AIB::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 77 of file AIB.cpp.

References accountNumber.

Referenced by operator=().

```
00077                                          {
00078     this->accountNumber = accountNumber;
00079 }
```

5.1.3.11 void AIB::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 61 of file AIB.cpp.

References address.

Referenced by operator=().

```
00061                                       {
00062     this->address = address;
00063 }
```

5.1.3.12 void AIB::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 69 of file AIB.cpp.

References balance.

Referenced by operator=().

```
00069                                     {
00070     this->balance = balance;
00071 }
```

5.1.3.13 void AIB::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 93 of file AIB.cpp.

References firstName.

Referenced by operator=().

```
00093                                         {
00094     this->firstName = firstName;
00095 }
```

5.1.3.14 void AIB::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 101 of file AIB.cpp.

References fullname.

Referenced by operator=().

```
00101                                         {
00102     this->fullname = fullname;
00103 }
```

5.1.3.15 void AIB::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 85 of file AIB.cpp.

References lastName.

Referenced by operator=().

```
00085                                          {
00086     this->lastName = lastName;
00087 }
```

5.1.3.16 void AIB::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

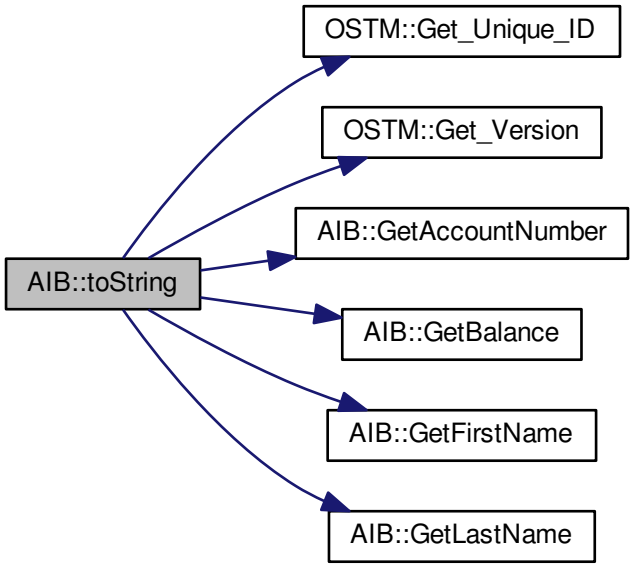
Definition at line 56 of file AIB.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00057 {
00058     std::cout << "\nAIB BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
       " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00059 }
```

Here is the call graph for this function:



5.1.4 Member Data Documentation

5.1.4.1 int AIB::accountNumber [private]

Definition at line 100 of file AIB.h.

Referenced by AIB(), GetAccountNumber(), operator=(), and SetAccountNumber().

5.1.4.2 std::string AIB::address [private]

Definition at line 102 of file AIB.h.

Referenced by AIB(), GetAddress(), operator=(), and SetAddress().

5.1.4.3 double AIB::balance [private]

Definition at line 101 of file AIB.h.

Referenced by AIB(), GetBalance(), operator=(), and SetBalance().

5.1.4.4 std::string AIB::firstName [private]

Definition at line 98 of file AIB.h.

Referenced by AIB(), GetFirstName(), operator=(), and SetFirstName().

5.1.4.5 std::string AIB::fullname [private]

Definition at line 97 of file AIB.h.

Referenced by AIB(), GetFullname(), operator=(), and SetFullname().

5.1.4.6 std::string AIB::lastName [private]

Definition at line 99 of file AIB.h.

Referenced by AIB(), GetLastName(), operator=(), and SetLastName().

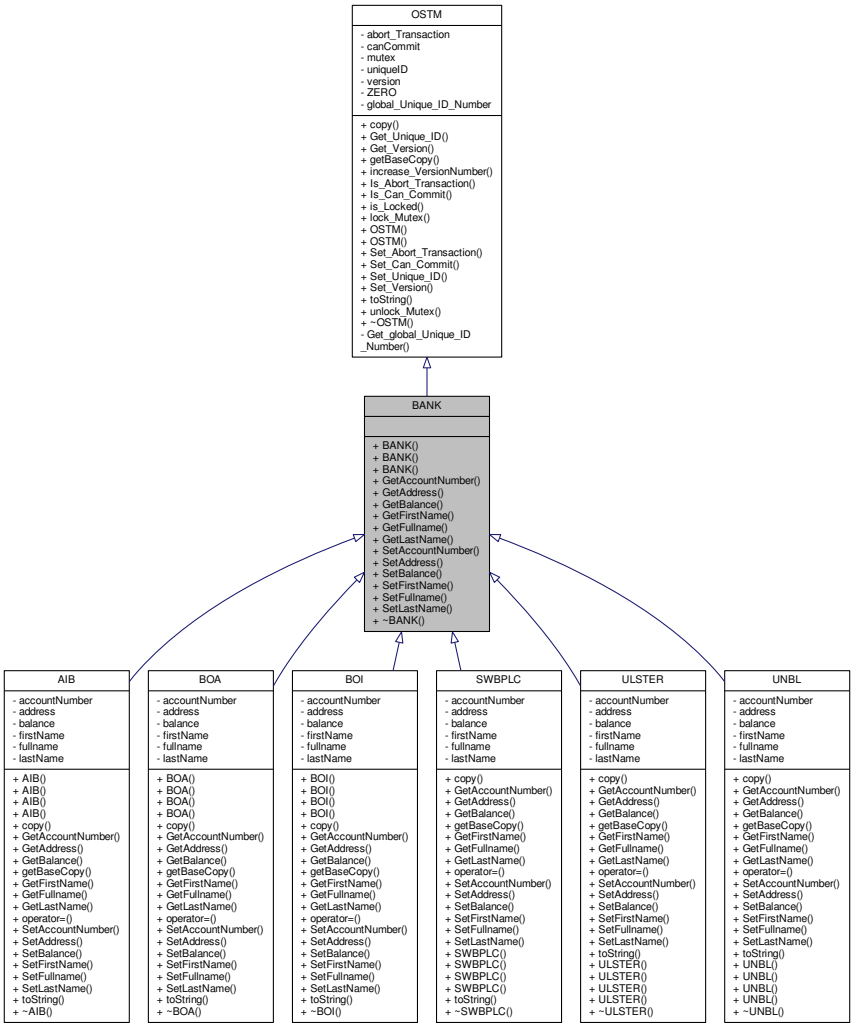
The documentation for this class was generated from the following files:

- AIB.h
- AIB.cpp

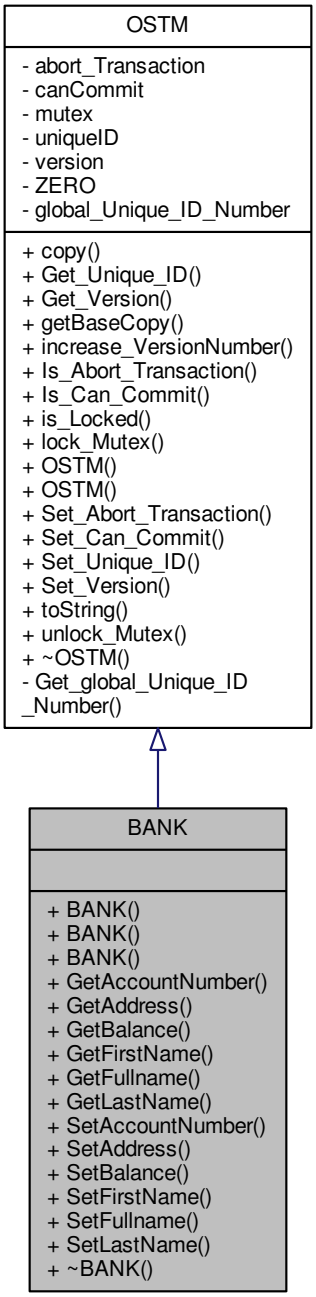
5.2 BANK Class Reference

`#include <BANK.h>`

Inheritance diagram for BANK:



Collaboration diagram for BANK:



Public Member Functions

- BANK ()
- BANK (int _version, int _unique_id)
- BANK (const BANK &orig)
- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const

- virtual double GetBalance () const
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual ~BANK ()

5.2.1 Detailed Description

BANK inherit from the OSTM library. It is declares the common functions in the child classes as a virtual function.

Definition at line 16 of file BANK.h.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 BANK::BANK ( ) [inline]

Constructor

Definition at line 23 of file BANK.h.

Referenced by BANK().

```
00023           : OSTM(){
00024
00025     };
```

5.2.2.2 BANK::BANK (int *_version,* int *_unique_id*) [inline]

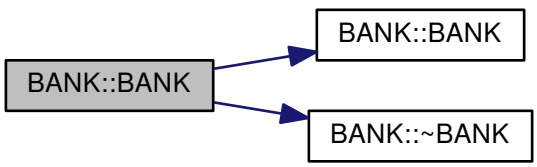
Custom Constructor

Definition at line 29 of file BANK.h.

References BANK(), and ~BANK().

```
00029                                       : OSTM(_version, _unique_id){
00030
00031     };
```

Here is the call graph for this function:



5.2.2.3 BANK::BANK (const BANK & *orig*)

Copy constructor

Definition at line 11 of file BANK.cpp.

```
00011                           {
00012 }
```

5.2.2.4 BANK::~BANK ( ) [virtual]

de-constructor

Definition at line 14 of file BANK.cpp.

Referenced by BANK().

```
00014             {
00015 }
```

5.2.3 Member Function Documentation

5.2.3.1 virtual int BANK::GetAccountNumber ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 49 of file BANK.h.

```
00049 {};
```

5.2.3.2 virtual std::string BANK::GetAddress ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 45 of file BANK.h.

```
00045 {};
```

5.2.3.3 virtual double BANK::GetBalance ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 47 of file BANK.h.

```
00047 {};
```

5.2.3.4 virtual std::string BANK::GetFirstName ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 53 of file BANK.h.

```
00053 {};
```

5.2.3.5 virtual std::string BANK::GetFullname ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 55 of file BANK.h.

```
00055 {};
```

5.2.3.6 virtual std::string BANK::GetLastName ( ) const [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 51 of file BANK.h.

```
00051 {};
```

5.2.3.7 virtual void BANK::SetAccountNumber (int *accountNumber*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 48 of file BANK.h.

```
00048 {};
```

5.2.3.8 virtual void BANK::SetAddress (std::string *address*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 44 of file BANK.h.

```
00044 {};
```

5.2.3.9 virtual void BANK::SetBalance (double *balance*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 46 of file BANK.h.

Referenced by _complex_transfer_(), _nesting_(), _six_account_transfer_(), and _two_account_transfer_().

```
00046 {};
```

5.2.3.10 virtual void BANK::SetFirstName (std::string *firstName*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 52 of file BANK.h.

```
00052 {};
```

5.2.3.11 virtual void BANK::SetFullname (std::string *fullname*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 54 of file BANK.h.

```
00054 {};
```

5.2.3.12 virtual void BANK::SetLastName (std::string *lastName*) [inline], [virtual]

Reimplemented in AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 50 of file BANK.h.

```
00050 {};
```

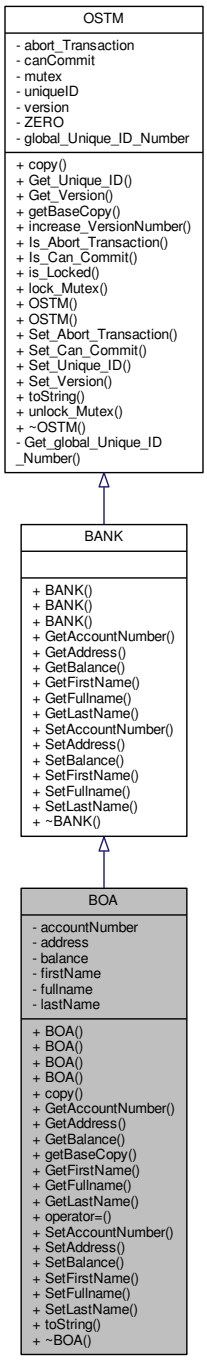
The documentation for this class was generated from the following files:

- BANK.h
- BANK.cpp

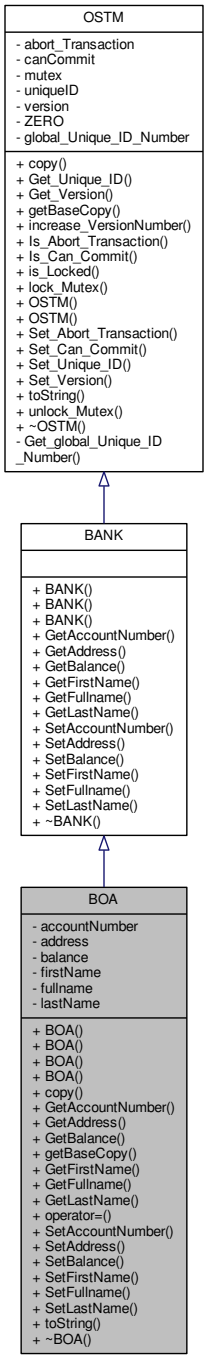
5.3 BOA Class Reference

```
#include <BOA.h>
```

Inheritance diagram for BOA:



Collaboration diagram for BOA:



Public Member Functions

- BOA ()
- BOA (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- BOA (std::shared_ptr< BANK > obj, int _version, int _unique_id)
- BOA (const BOA &orig)
- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

copy function, make deep copy of the object/pointer

- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- BOA operator= (const BOA &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~BOA ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.3.1 Detailed Description

Inherit from BANK

Definition at line 18 of file BOA.h.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 BOA::BOA ( ) [inline]

Constructor

Definition at line 24 of file BOA.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by BOA(), and getBaseCopy().

```
00024           : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
```

5.3.2.2 BOA::BOA (int *accountNumber,* double *balance,* std::string *firstName,* std::string *lastName,* std::string *address*) [inline]

Custom constructor

Definition at line 35 of file BOA.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00035                                                                                                                                :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
```

5.3.2.3 BOA::BOA (std::shared_ptr< BANK > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 46 of file BOA.h.

References accountNumber, address, balance, BOA(), firstName, fullname, and lastName.

```
00046                                                                 : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
```

Here is the call graph for this function:

5.3.2.4 BOA::BOA (const BOA & *orig*)

Copy constructor

Definition at line 12 of file BOA.cpp.

```
00012                       {
00013 }
```

5.3.2.5 BOA::~BOA ( ) [virtual]

de-constructor

Definition at line 15 of file BOA.cpp.

Referenced by operator=().

```
00015           {
00016 }
```

5.3.3 Member Function Documentation

5.3.3.1 void BOA::copy (std::shared_ptr< OSTM > *to*, std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>
objFROM	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

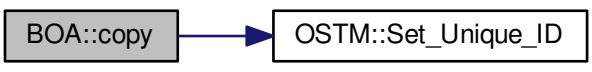
Definition at line 34 of file BOA.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00034                                                                   {
00035
00036     std::shared_ptr<BOA> objTO = std::dynamic_pointer_cast<BOA>(to);
00037     std::shared_ptr<BOA> objFROM = std::dynamic_pointer_cast<BOA>(from);
00038     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00039     objTO->Set_Version(objFROM->Get_Version());
00040     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00041     objTO->SetBalance(objFROM->GetBalance());
00042
00043 }
```

Here is the call graph for this function:



5.3.3.2 int BOA::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 80 of file BOA.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00080                                {
00081     return accountNumber;
00082 }
```

5.3.3.3 std::string BOA::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 64 of file BOA.cpp.

References address.

Referenced by operator=().

```
00064                                {
00065     return address;
00066 }
```

5.3.3.4 double BOA::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 72 of file BOA.cpp.

References balance.

Referenced by operator=(), and toString().

```
00072                               {
00073     return balance;
00074 }
```

5.3.3.5 std::shared_ptr< OSTM > BOA::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a std::shared_ptr<BANK> return type

Reimplemented from OSTM.

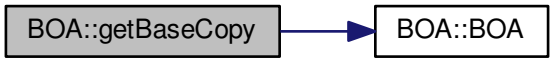
Definition at line 22 of file BOA.cpp.

References BOA().

Referenced by operator=().

```
00023 {
00024         std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00025     std::shared_ptr<BANK> obj(new BOA(objTO,object->Get_Version(),object->Get_Unique_ID()));
00026         std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00027     return ostm_obj;
00028 }
```

Here is the call graph for this function:



5.3.3.6 std::string BOA::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 96 of file BOA.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00096                                {
00097     return firstName;
00098 }
```

5.3.3.7 std::string BOA::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 104 of file BOA.cpp.

References fullname.

Referenced by operator=().

```
00104                               {
00105     return fullname;
00106 }
```

5.3.3.8 std::string BOA::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 88 of file BOA.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00088                                   {
00089     return lastName;
00090 }
```

5.3.3.9 BOA BOA::operator= (const BOA & *orig*) [inline]

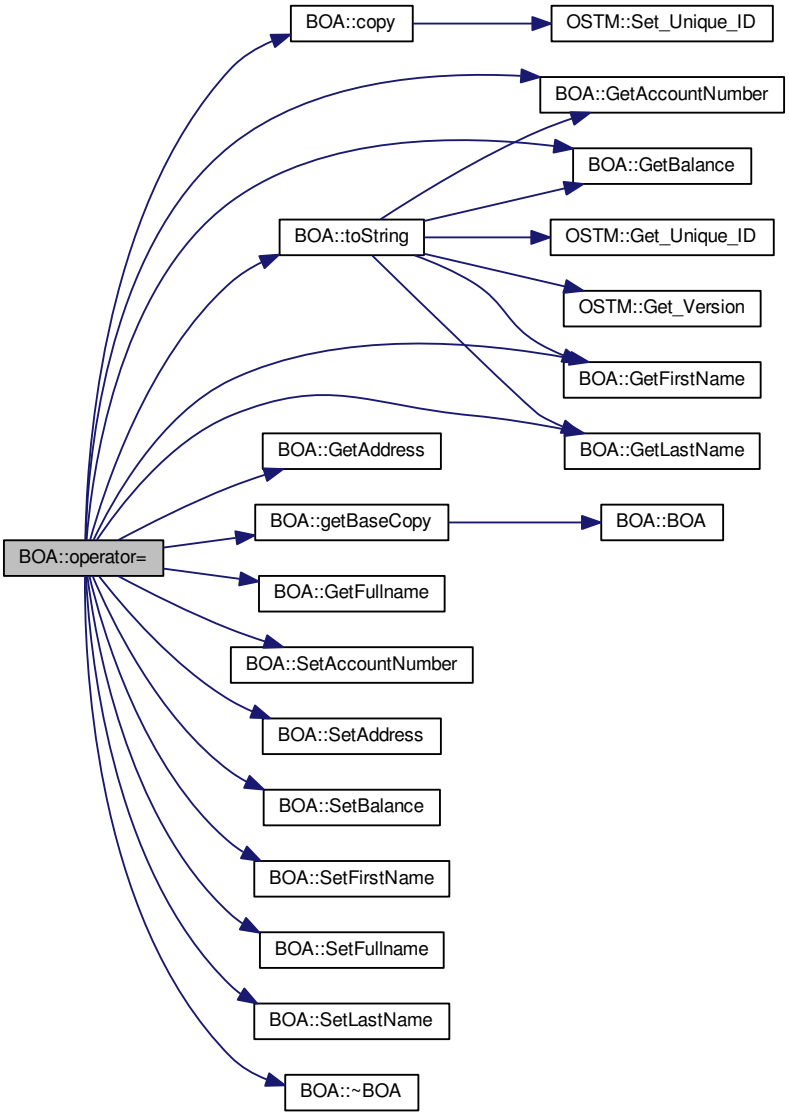
Operator

Definition at line 64 of file BOA.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~BOA().

```
00064                                   {
00065     };
```

Here is the call graph for this function:



5.3.3.10 void BOA::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 76 of file BOA.cpp.

References accountNumber.

Referenced by operator=().

```
00076                                          {
00077     this->accountNumber = accountNumber;
00078 }
```

5.3.3.11 void BOA::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 60 of file BOA.cpp.

References address.

Referenced by operator=().

```
00060                                       {
00061     this->address = address;
00062 }
```

5.3.3.12 void BOA::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 68 of file BOA.cpp.

References balance.

Referenced by operator=().

```
00068                                     {
00069     this->balance = balance;
00070 }
```

5.3.3.13 void BOA::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 92 of file BOA.cpp.

References firstName.

Referenced by operator=().

```
00092                                         {
00093     this->firstName = firstName;
00094 }
```

5.3.3.14 void BOA::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 100 of file BOA.cpp.

References fullname.

Referenced by operator=().

```
00100                                       {
00101     this->fullname = fullname;
00102 }
```

5.3.3.15 void BOA::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 84 of file BOA.cpp.

References lastName.

Referenced by operator=().

```
00084                                          {
00085     this->lastName = lastName;
00086 }
```

5.3.3.16 void BOA::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

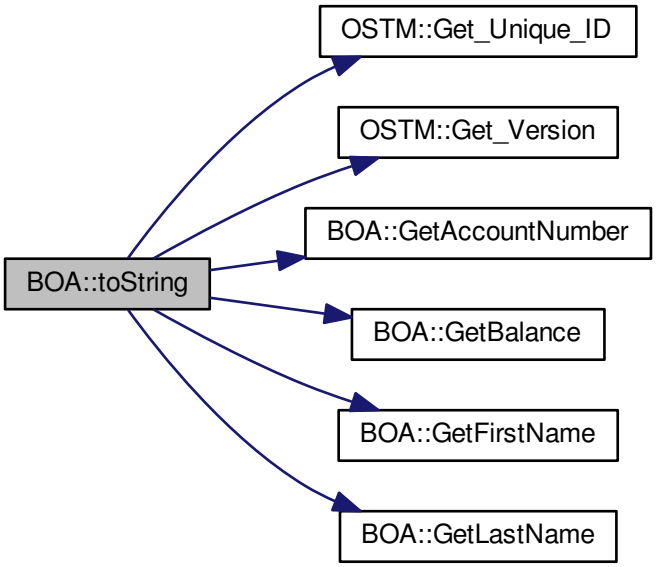
Definition at line 54 of file BOA.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00055 {
00056    // std::cout << "\nUnique ID : " << this->GetUniqueID() << "\nInt value : " << this->GetV_int() <<
       "\nDouble value : " << this->GetV_double() << "\nFloat value : " << this->GetV_float() << "\nString value : " <<
       this->GetV_string()  << "\nVersion number : " << this->GetVersion() << "\nLoad Counter : "<<
       this->GetLoadCounter() << "\nWrite Counter : "<< this->GetWriteCounter() << std::endl;
00057      std::cout << "\nBOA BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account
      : " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00058 }
```

Here is the call graph for this function:



5.3.4 Member Data Documentation

5.3.4.1 int BOA::accountNumber [private]

Definition at line 98 of file BOA.h.

Referenced by BOA(), GetAccountNumber(), operator=(), and SetAccountNumber().

5.3.4.2 std::string BOA::address [private]

Definition at line 100 of file BOA.h.

Referenced by BOA(), GetAddress(), operator=(), and SetAddress().

5.3.4.3 double BOA::balance [private]

Definition at line 99 of file BOA.h.

Referenced by BOA(), GetBalance(), operator=(), and SetBalance().

5.3.4.4 std::string BOA::firstName [private]

Definition at line 96 of file BOA.h.

Referenced by BOA(), GetFirstName(), operator=(), and SetFirstName().

5.3.4.5 std::string BOA::fullname [private]

Definition at line 95 of file BOA.h.

Referenced by BOA(), GetFullname(), operator=(), and SetFullname().

5.3.4.6 std::string BOA::lastName [private]

Definition at line 97 of file BOA.h.

Referenced by BOA(), GetLastName(), operator=(), and SetLastName().

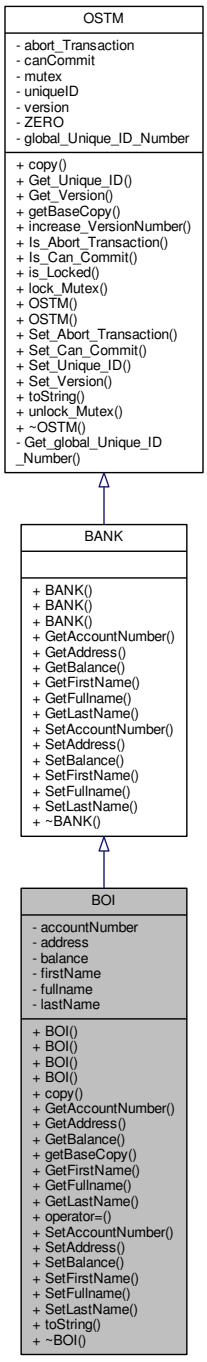
The documentation for this class was generated from the following files:

- BOA.h
- BOA.cpp

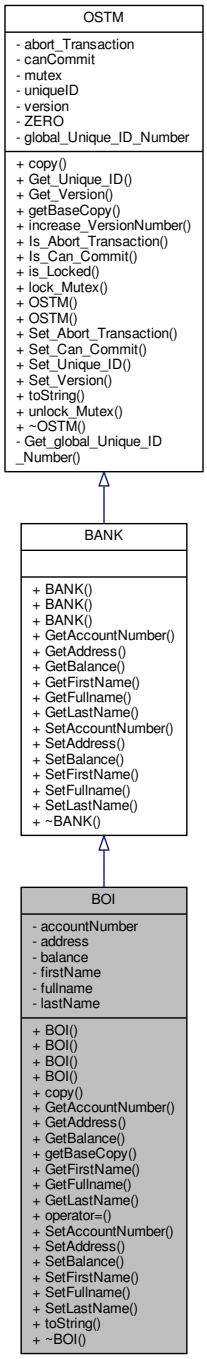
5.4 BOI Class Reference

`#include <BOI.h>`

Inheritance diagram for BOI:



Collaboration diagram for BOI:



Public Member Functions

- BOI ()
- BOI (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- BOI (std::shared_ptr< BOI > obj, int _version, int _unique_id)
- BOI (const BOI &orig)
- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

copy function, make deep copy of the object/pointer

- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK type object*
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- BOI operator= (const BOI &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~BOI ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.4.1 Detailed Description

Inherit from BANK

Definition at line 19 of file BOI.h.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 BOI::BOI ( ) [inline]

Constructor

Definition at line 24 of file BOI.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by BOI(), and getBaseCopy().

```
00024           : BANK()
00025     {
00026         this->accountNumber = 0;
00027         this->balance = 50;
00028         this->firstName = "Joe";
00029         this->lastName = "Blog";
00030         this->address = "High street, Carlow";
00031         this->fullname = firstName + " " + lastName;
00032 
00033     }
```

5.4.2.2 BOI::BOI (int *accountNumber,* double *balance,* std::string *firstName,* std::string *lastName,* std::string *address*) [inline]

Custom constructor

Definition at line 37 of file BOI.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00037                                                                                          :
      BANK()
00038     {
00039         this->accountNumber = accountNumber;
00040         this->balance = balance;
00041         this->firstName = firstName;
00042         this->lastName = lastName;
00043         this->address = address;
00044         this->fullname = firstName + " " + lastName;
00045     };
```

5.4.2.3 BOI::BOI (std::shared_ptr< BOI > *obj,* int *_version,* int *_unique_id*) [inline]

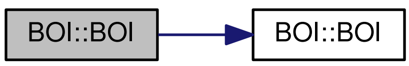
Custom constructor, used by the library for deep copying

Definition at line 49 of file BOI.h.

References accountNumber, address, balance, BOI(), firstName, fullname, and lastName.

```
00049                                                       : BANK(_version, _unique_id)
00050     {
00051         this->accountNumber = obj->GetAccountNumber();
00052         this->balance = obj->GetBalance();
00053         this->firstName = obj->GetFirstName();
00054         this->lastName = obj->GetLastName();
00055         this->address = obj->GetAddress();
00056         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00057     };
```

Here is the call graph for this function:



5.4.2.4 BOI::BOI (const BOI & *orig*)

Copy constructor

Definition at line 15 of file BOI.cpp.

```
00015                              {
00016 }
```

5.4.2.5 BOI::~BOI ( ) [virtual]

de-constructor

Definition at line 12 of file BOI.cpp.

Referenced by operator=().

```
00012           {
00013 }
```

5.4.3 Member Function Documentation

5.4.3.1 void BOI::copy (std::shared_ptr< OSTM > *to*, std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK* type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK* type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

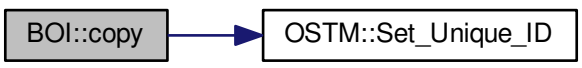
Definition at line 35 of file BOI.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00035                                                                   {
00036
00037     std::shared_ptr<BOI> objTO = std::dynamic_pointer_cast<BOI>(to);
00038     std::shared_ptr<BOI> objFROM = std::dynamic_pointer_cast<BOI>(from);
00039     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00040     objTO->Set_Version(objFROM->Get_Version());
00041     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00042     objTO->SetBalance(objFROM->GetBalance());
00043 }
```

Here is the call graph for this function:



5.4.3.2 int BOI::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 78 of file BOI.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00078                                   {
00079     return accountNumber;
00080 }
```

5.4.3.3 std::string BOI::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 62 of file BOI.cpp.

References address.

Referenced by operator=().

```
00062                                   {
00063     return address;
00064 }
```

5.4.3.4 double BOI::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 70 of file BOI.cpp.

References balance.

Referenced by operator=(), and toString().

```
00070                                   {
00071     return balance;
00072 }
```

5.4.3.5 std::shared_ptr< OSTM > BOI::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK* type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK* return type

Reimplemented from OSTM.

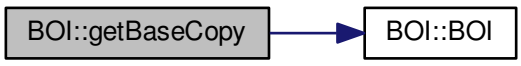
Definition at line 22 of file BOI.cpp.

References BOI().

Referenced by operator=().

```
00023 {
00024
00025     std::shared_ptr<BOI> objTO = std::dynamic_pointer_cast<BOI>(object);
00026     std::shared_ptr<BOI> obj(new BOI(objTO,object->Get_Version(),object->Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
```

Here is the call graph for this function:



5.4.3.6 std::string BOI::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 94 of file BOI.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00094                                  {
00095     return firstName;
00096 }
```

5.4.3.7 std::string BOI::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 102 of file BOI.cpp.

References fullname.

Referenced by operator=().

```
00102                                 {
00103     return fullname;
00104 }
```

5.4.3.8 std::string BOI::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 86 of file BOI.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00086                                   {
00087     return lastName;
00088 }
```

5.4.3.9 BOI BOI::operator= (const BOI & *orig*) [inline]

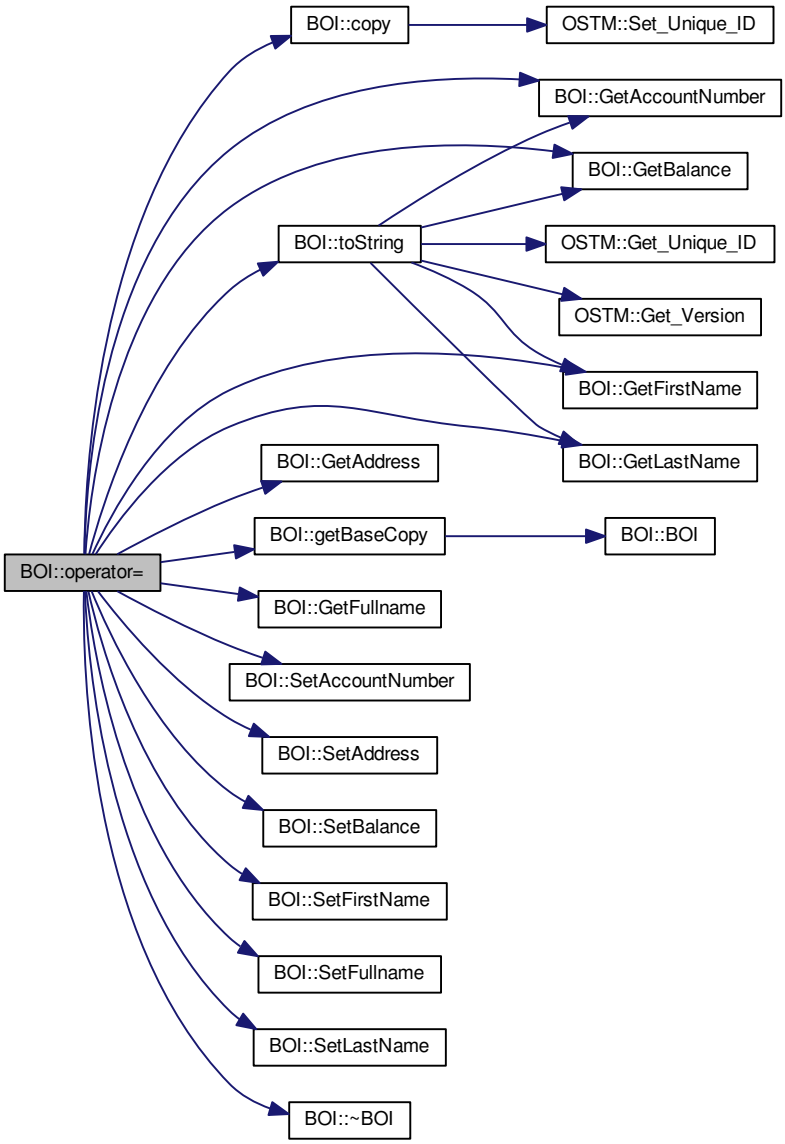
Operator

Definition at line 65 of file BOI.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~BOI().

```
00065 {};
```

Here is the call graph for this function:



5.4.3.10 void BOI::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 74 of file BOI.cpp.

References accountNumber.

Referenced by operator=().

```
00074                                          {
00075     this->accountNumber = accountNumber;
00076 }
```

5.4.3.11 void BOI::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 58 of file BOI.cpp.

References address.

Referenced by operator=().

```
00058                                       {
00059     this->address = address;
00060 }
```

5.4.3.12 void BOI::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 66 of file BOI.cpp.

References balance.

Referenced by operator=().

```
00066                                     {
00067     this->balance = balance;
00068 }
```

5.4.3.13 void BOI::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 90 of file BOI.cpp.

References firstName.

Referenced by operator=().

```
00090                                         {
00091     this->firstName = firstName;
00092 }
```

5.4.3.14 void BOI::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 98 of file BOI.cpp.

References fullname.

Referenced by operator=().

```
00098                                       {
00099     this->fullname = fullname;
00100 }
```

5.4.3.15 void BOI::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 82 of file BOI.cpp.

References lastName.

Referenced by operator=().

```
00082                                          {
00083     this->lastName = lastName;
00084 }
```

5.4.3.16 void BOI::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

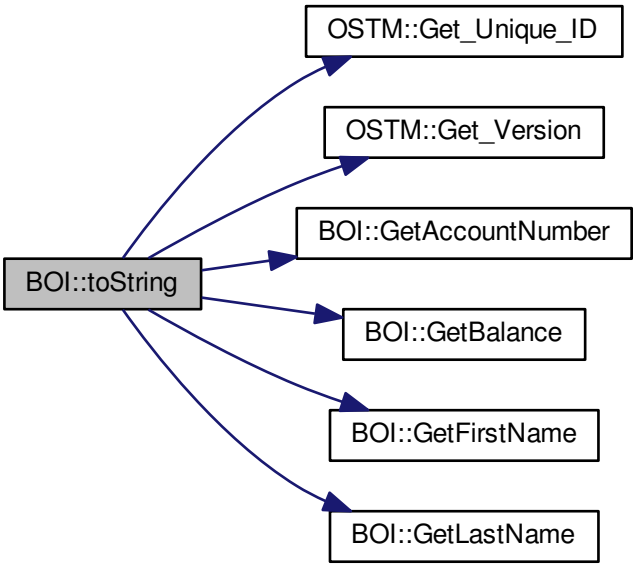
Definition at line 54 of file BOI.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00055 {
00056    std::cout << "\nBOI BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
      " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00057 }
```

Here is the call graph for this function:



5.4.4 Member Data Documentation

5.4.4.1 int BOI::accountNumber [private]

Definition at line 99 of file BOI.h.

Referenced by BOI(), GetAccountNumber(), operator=(), and SetAccountNumber().

5.4.4.2 std::string BOI::address [private]

Definition at line 101 of file BOI.h.

Referenced by BOI(), GetAddress(), operator=(), and SetAddress().

5.4.4.3 double BOI::balance [private]

Definition at line 100 of file BOI.h.

Referenced by BOI(), GetBalance(), operator=(), and SetBalance().

5.4.4.4 std::string BOI::firstName [private]

Definition at line 97 of file BOI.h.

Referenced by BOI(), GetFirstName(), operator=(), and SetFirstName().

5.4.4.5 std::string BOI::fullname [private]

Definition at line 96 of file BOI.h.

Referenced by BOI(), GetFullname(), operator=(), and SetFullname().

5.4.4.6 std::string BOI::lastName [private]

Definition at line 98 of file BOI.h.

Referenced by BOI(), GetLastName(), operator=(), and SetLastName().

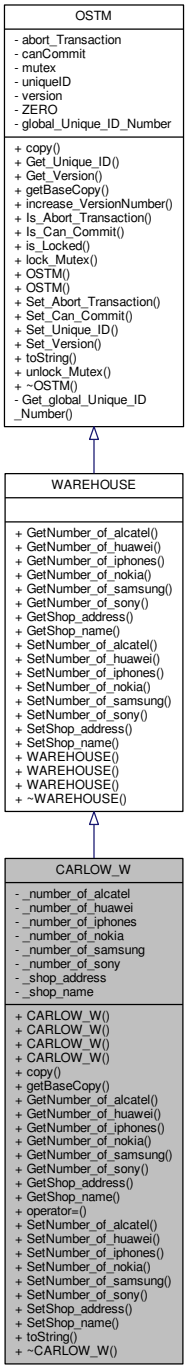
The documentation for this class was generated from the following files:

- BOI.h
- BOI.cpp

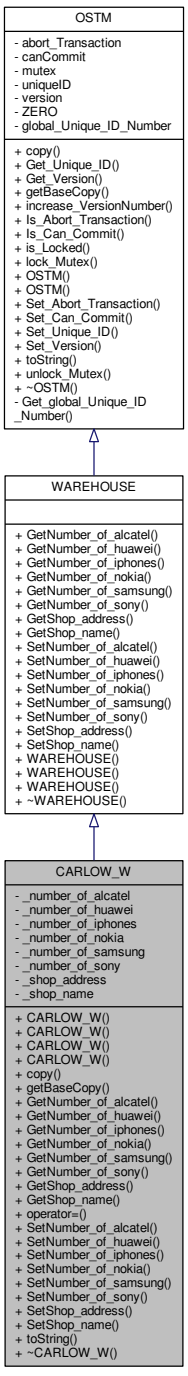
5.5 CARLOW_W Class Reference

`#include <CARLOW_W.h>`

Inheritance diagram for CARLOW_W:



Collaboration diagram for CARLOW_W:



Public Member Functions

- CARLOW_W ()
- CARLOW_W (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)
- CARLOW_W (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- CARLOW_W (const CARLOW_W &orig)

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()
- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- CARLOW_W operator= (const CARLOW_W &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ∼CARLOW_W ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.5.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file CARLOW_W.h.

5.5.2 Constructor & Destructor Documentation

5.5.2.1 CARLOW_W::CARLOW_W ( ) [inline]

Constructor

Definition at line 24 of file CARLOW_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_↩ samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by CARLOW_W(), and getBaseCopy().

```
00024                : WAREHOUSE(){
00025
00026         this->_shop_address = "Carlow potato street";
00027         this->_shop_name = "CARLOW C_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
```

5.5.2.2 CARLOW_W::CARLOW_W (std::string *address,* std::string *shop_name,* int *iphone,* int *samsung,* int *sony,* int *huawei,* int *nokia,* int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file CARLOW_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_↩ samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                     : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.5.2.3 CARLOW_W::CARLOW_W (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file CARLOW_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and CARLOW_W().

```
00055                                                                    :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.5.2.4 CARLOW_W::CARLOW_W (const CARLOW_W & *orig*)

Copy constructor

Definition at line 17 of file CARLOW_W.cpp.

```
00017                                      {
00018 }
```

5.5.2.5 CARLOW_W::~CARLOW_W ( ) [virtual]

de-constructor

Definition at line 14 of file CARLOW_W.cpp.

Referenced by operator=().

```
00014                       {
00015 }
```

5.5.3 Member Function Documentation

5.5.3.1 void CARLOW_W::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 37 of file CARLOW_W.cpp.

References _shop_address.

Referenced by operator=().

```
00037                                                                    {
00038
00039     std::shared_ptr<CARLOW_W> objTO = std::dynamic_pointer_cast<CARLOW_W>(to);
00040     std::shared_ptr<CARLOW_W> objFROM = std::dynamic_pointer_cast<CARLOW_W>(from);
00041     objTO->_shop_address = objFROM->GetShop_address();
00042     objTO->_shop_name = objFROM->GetShop_name();
00043     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00044     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00045     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00046     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00047     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00048     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00049     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00050     objTO->Set_Version(objFROM->Get_Version());
00051
00052
00053 }
```

5.5.3.2 std::shared_ptr< OSTM > CARLOW_W::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

Definition at line 24 of file CARLOW_W.cpp.

References CARLOW_W().

Referenced by operator=().

```
00025 {
00026
00027     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00028     std::shared_ptr<WAREHOUSE> obj(new CARLOW_W(objTO, object->Get_Version(),object->Get_Unique_ID(
    )));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00030     return ostm_obj;
00031 }
```

Here is the call graph for this function:

5.5.3.3 int CARLOW_W::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 75 of file CARLOW_W.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00075                                {
00076     return _number_of_alcatel;
00077 }
```

5.5.3.4 int CARLOW_W::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 91 of file CARLOW_W.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00091                                {
00092     return _number_of_huawei;
00093 }
```

5.5.3.5 int CARLOW_W::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 115 of file CARLOW_W.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00115                                {
00116     return _number_of_iphones;
00117 }
```

5.5.3.6 int CARLOW_W::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 83 of file CARLOW_W.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00083                                {
00084     return _number_of_nokia;
00085 }
```

5.5.3.7 int CARLOW_W::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 107 of file CARLOW_W.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00107                                  {
00108     return _number_of_samsung;
00109 }
```

5.5.3.8 int CARLOW_W::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 99 of file CARLOW_W.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00099                                {
00100     return _number_of_sony;
00101 }
```

5.5.3.9 std::string CARLOW_W::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 131 of file CARLOW_W.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00131                                   {
00132     return _shop_address;
00133 }
```

5.5.3.10 std::string CARLOW_W::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 123 of file CARLOW_W.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00123                                {
00124     return _shop_name;
00125 }
```

5.5.3.11 CARLOW_W CARLOW_W::operator= (const CARLOW_W & *orig*) [inline]

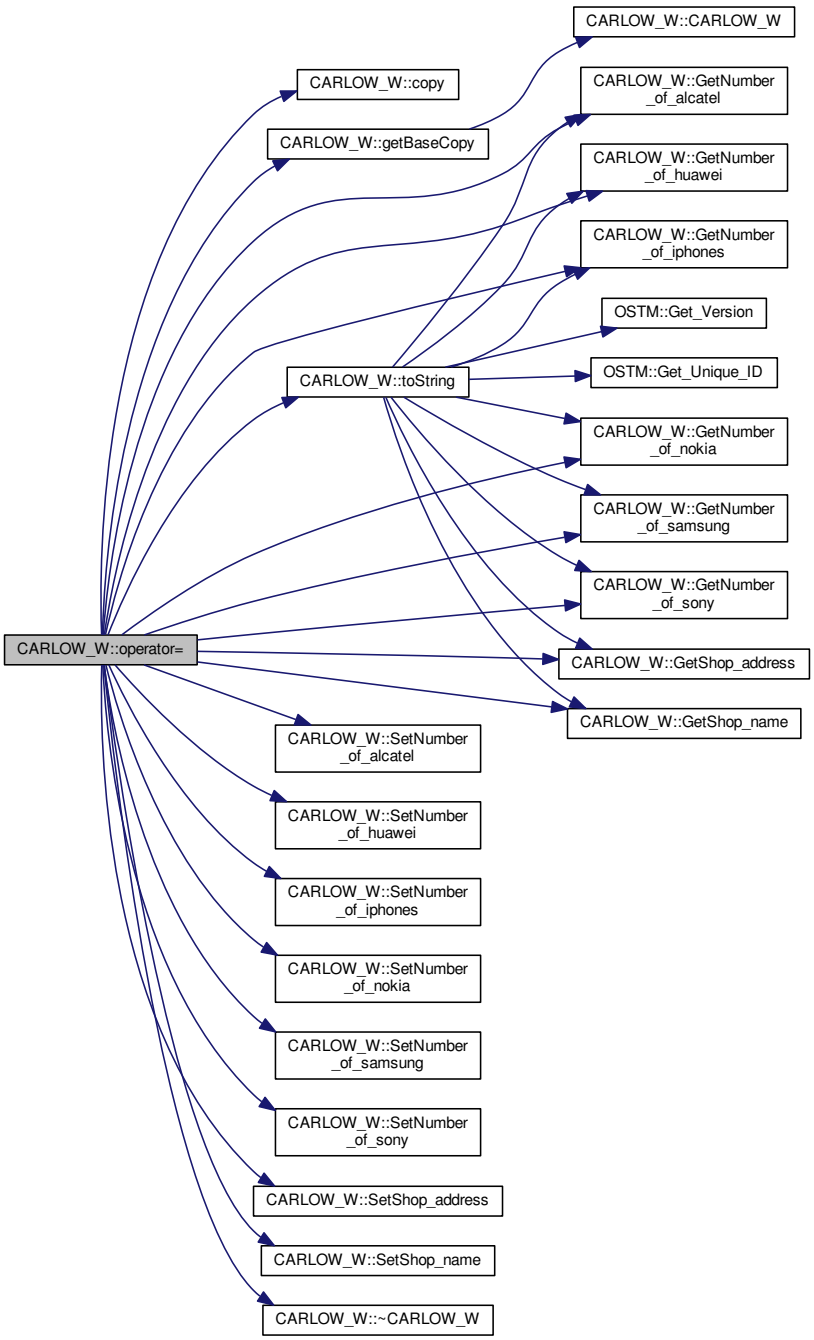
Operator

Definition at line 75 of file CARLOW_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~CARLOW_W().

```
00075 {};
```

Here is the call graph for this function:



5.5.3.12 void CARLOW_W::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 71 of file CARLOW_W.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00071                                                   {
00072     this->_number_of_alcatel = _number_of_alcatel;
00073 }
```

5.5.3.13 void CARLOW_W::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 87 of file CARLOW_W.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00087                                                   {
00088     this->_number_of_huawei = _number_of_huawei;
00089 }
```

5.5.3.14 void CARLOW_W::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 111 of file CARLOW_W.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00111                                                   {
00112     this->_number_of_iphones = _number_of_iphones;
00113 }
```

5.5.3.15 void CARLOW_W::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 79 of file CARLOW_W.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00079                                                   {
00080     this->_number_of_nokia = _number_of_nokia;
00081 }
```

5.5.3.16 void CARLOW_W::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 103 of file CARLOW_W.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00103                                                   {
00104     this->_number_of_samsung = _number_of_samsung;
00105 }
```

5.5.3.17 void CARLOW_W::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 95 of file CARLOW_W.cpp.

References _number_of_sony.

Referenced by operator=().

```
00095                                                    {
00096     this->_number_of_sony = _number_of_sony;
00097 }
```

5.5.3.18 void CARLOW_W::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 127 of file CARLOW_W.cpp.

References _shop_address.

Referenced by operator=().

```
00127                                                     {
00128     this->_shop_address = _shop_address;
00129 }
```

5.5.3.19 void CARLOW_W::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 119 of file CARLOW_W.cpp.

References _shop_name.

Referenced by operator=().

```
00119                                                  {
00120     this->_shop_name = _shop_name;
00121 }
```

5.5.3.20 void CARLOW_W::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

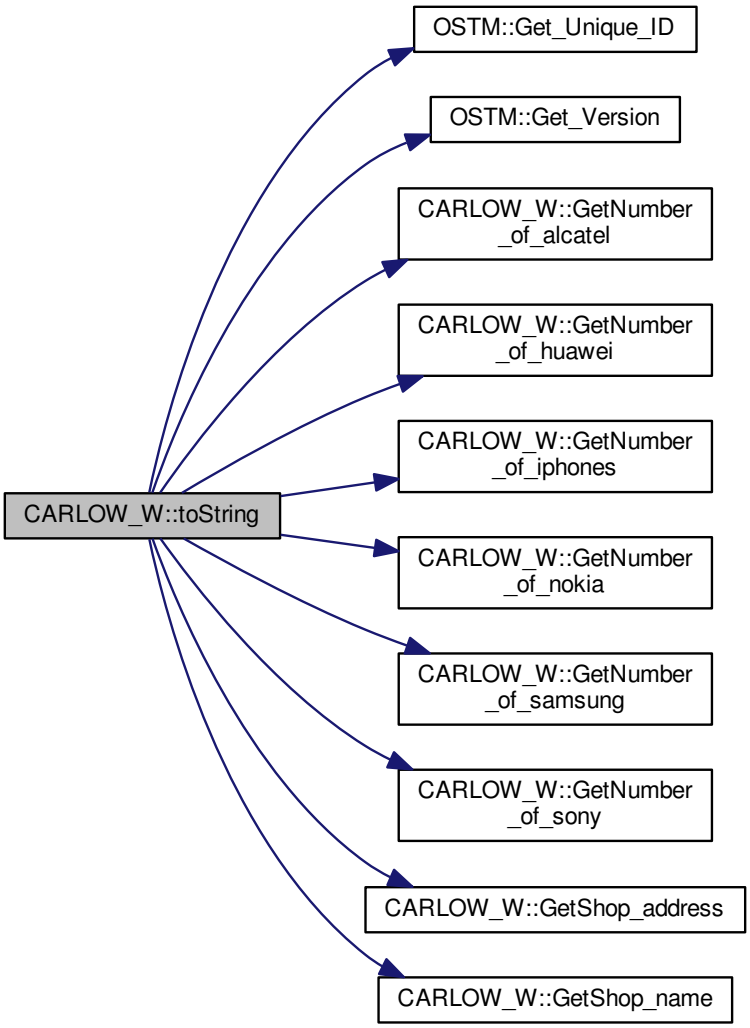
Definition at line 64 of file CARLOW_W.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), and GetShop_name().

Referenced by operator=().

```
00065 {
00066     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00067 }
```

Here is the call graph for this function:



5.5.4 Member Data Documentation

5.5.4.1 int CARLOW_W::_number_of_alcatel [private]

Definition at line 116 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_alcatel(), operator=(), and SetNumber_of_alcatel().

5.5.4.2 int CARLOW_W::_number_of_huawei [private]

Definition at line 114 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_huawei(), operator=(), and SetNumber_of_huawei().

5.5.4.3 int CARLOW_W::_number_of_iphones [private]

Definition at line 111 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_iphones(), operator=(), and SetNumber_of_iphones().

5.5.4.4 int CARLOW_W::_number_of_nokia [private]

Definition at line 115 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_nokia(), operator=(), and SetNumber_of_nokia().

5.5.4.5 int CARLOW_W::_number_of_samsung [private]

Definition at line 112 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_samsung(), operator=(), and SetNumber_of_samsung().

5.5.4.6 int CARLOW_W::_number_of_sony [private]

Definition at line 113 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetNumber_of_sony(), operator=(), and SetNumber_of_sony().

5.5.4.7 std::string CARLOW_W::_shop_address [private]

Definition at line 109 of file CARLOW_W.h.

Referenced by CARLOW_W(), copy(), GetShop_address(), operator=(), and SetShop_address().

5.5.4.8 std::string CARLOW_W::_shop_name [private]

Definition at line 110 of file CARLOW_W.h.

Referenced by CARLOW_W(), GetShop_name(), operator=(), and SetShop_name().

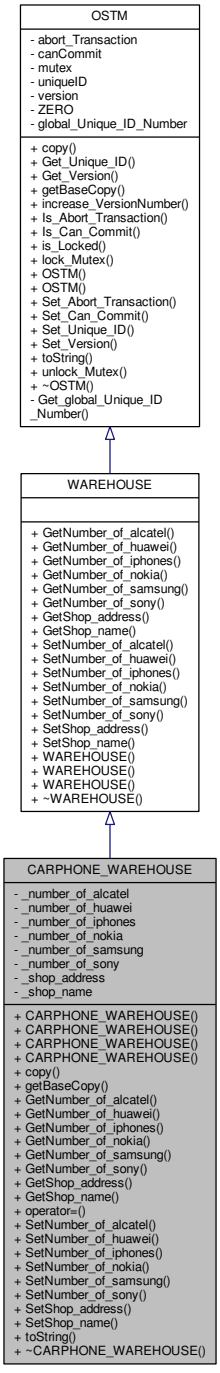
The documentation for this class was generated from the following files:

- CARLOW_W.h
- CARLOW_W.cpp

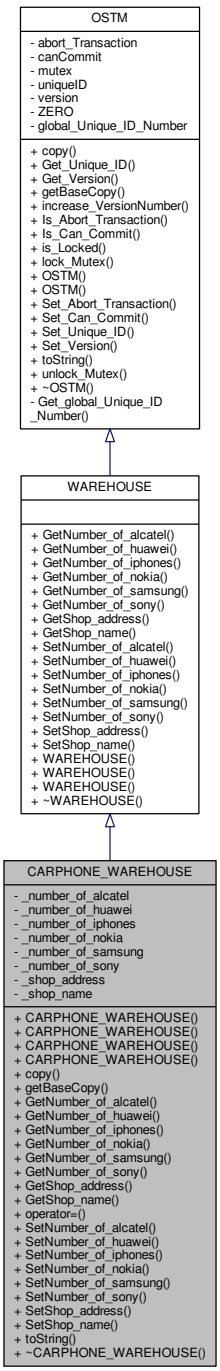
5.6 CARPHONE_WAREHOUSE Class Reference

`#include <CARPHONE_WAREHOUSE.h>`

Inheritance diagram for CARPHONE_WAREHOUSE:



Collaboration diagram for CARPHONE_WAREHOUSE:



Public Member Functions

- CARPHONE_WAREHOUSE ()
- CARPHONE_WAREHOUSE (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)
- CARPHONE_WAREHOUSE (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- CARPHONE_WAREHOUSE (const CARPHONE_WAREHOUSE &orig)

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()
- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- CARPHONE_WAREHOUSE operator= (const CARPHONE_WAREHOUSE &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ∼CARPHONE_WAREHOUSE ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.6.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file CARPHONE_WAREHOUSE.h.

5.6.2 Constructor & Destructor Documentation

5.6.2.1 CARPHONE_WAREHOUSE::CARPHONE_WAREHOUSE ( ) [inline]

Constructor

Definition at line 24 of file CARPHONE_WAREHOUSE.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by CARPHONE_WAREHOUSE(), and getBaseCopy().

```
00024                         : WAREHOUSE(){
00025
00026         this->_shop_address = "DUBLIN XII";
00027         this->_shop_name = "DISTRIBUTION CENTER";
00028         this->_number_of_iphones = 10000;
00029         this->_number_of_samsung = 10000;
00030         this->_number_of_sony = 10000;
00031         this->_number_of_huawei = 10000;
00032         this->_number_of_nokia = 10000;
00033         this->_number_of_alcatel = 10000;
00034     };
```

5.6.2.2 CARPHONE_WAREHOUSE::CARPHONE_WAREHOUSE (std::string *address,* std::string *shop_name,* int *iphone,* int *samsung,* int *sony,* int *huawei,* int *nokia,* int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file CARPHONE_WAREHOUSE.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                              : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.6.2.3 CARPHONE_WAREHOUSE::CARPHONE_WAREHOUSE (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file CARPHONE_WAREHOUSE.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and CARPHONE_WAREHOUSE().

```
00055                                                                                :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.6.2.4 CARPHONE_WAREHOUSE::CARPHONE_WAREHOUSE (const CARPHONE_WAREHOUSE & *orig*)

Copy constructor

Definition at line 11 of file CARPHONE_WAREHOUSE.cpp.

```
00011                                                        {
00012 }
```

5.6.2.5 CARPHONE_WAREHOUSE::~CARPHONE_WAREHOUSE ( ) [virtual]

de-constructor

Definition at line 14 of file CARPHONE_WAREHOUSE.cpp.

Referenced by operator=().

```
00014                                    {
00015 }
```

5.6.3 Member Function Documentation

5.6.3.1 void CARPHONE_WAREHOUSE::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 34 of file CARPHONE_WAREHOUSE.cpp.

References _shop_address.

Referenced by operator=().

```
00034                                                                                {
00035
00036     std::shared_ptr<CARPHONE_WAREHOUSE> objTO = std::dynamic_pointer_cast<
      CARPHONE_WAREHOUSE>(to);
00037     std::shared_ptr<CARPHONE_WAREHOUSE> objFROM = std::dynamic_pointer_cast<
      CARPHONE_WAREHOUSE>(from);
00038     objTO->_shop_address = objFROM->GetShop_address();
00039     objTO->_shop_name = objFROM->GetShop_name();
00040     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00041     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00042     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00043     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00044     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00045     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00046     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00047     objTO->Set_Version(objFROM->Get_Version());
00048
00049 }
```

5.6.3.2 std::shared_ptr< OSTM > CARPHONE_WAREHOUSE::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

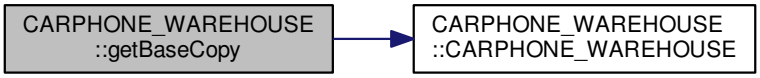
Definition at line 21 of file CARPHONE_WAREHOUSE.cpp.

References CARPHONE_WAREHOUSE().

Referenced by operator=().

```
00022 {
00023
00024     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00025     std::shared_ptr<WAREHOUSE> obj(new CARPHONE_WAREHOUSE(objTO, object->Get_Version(),
      object->Get_Unique_ID()));
00026     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00027     return ostm_obj;
00028 }
```

Here is the call graph for this function:



5.6.3.3 int CARPHONE_WAREHOUSE::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 71 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00071                                           {
00072     return _number_of_alcatel;
00073 }
```

5.6.3.4 int CARPHONE_WAREHOUSE::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 87 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00087                                           {
00088     return _number_of_huawei;
00089 }
```

5.6.3.5 int CARPHONE_WAREHOUSE::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 111 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00111                                           {
00112     return _number_of_iphones;
00113 }
```

5.6.3.6 int CARPHONE_WAREHOUSE::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 79 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00079                                          {
00080     return _number_of_nokia;
00081 }
```

5.6.3.7 int CARPHONE_WAREHOUSE::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 103 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00103                                            {
00104     return _number_of_samsung;
00105 }
```

5.6.3.8 int CARPHONE_WAREHOUSE::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 95 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00095                                         {
00096     return _number_of_sony;
00097 }
```

5.6.3.9 std::string CARPHONE_WAREHOUSE::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 127 of file CARPHONE_WAREHOUSE.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00127                                            {
00128     return _shop_address;
00129 }
```

5.6.3.10 std::string CARPHONE_WAREHOUSE::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 119 of file CARPHONE_WAREHOUSE.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00119                                       {
00120     return _shop_name;
00121 }
```

5.6.3.11 CARPHONE_WAREHOUSE CARPHONE_WAREHOUSE::operator= (const CARPHONE_WAREHOUSE & *orig*) [inline]

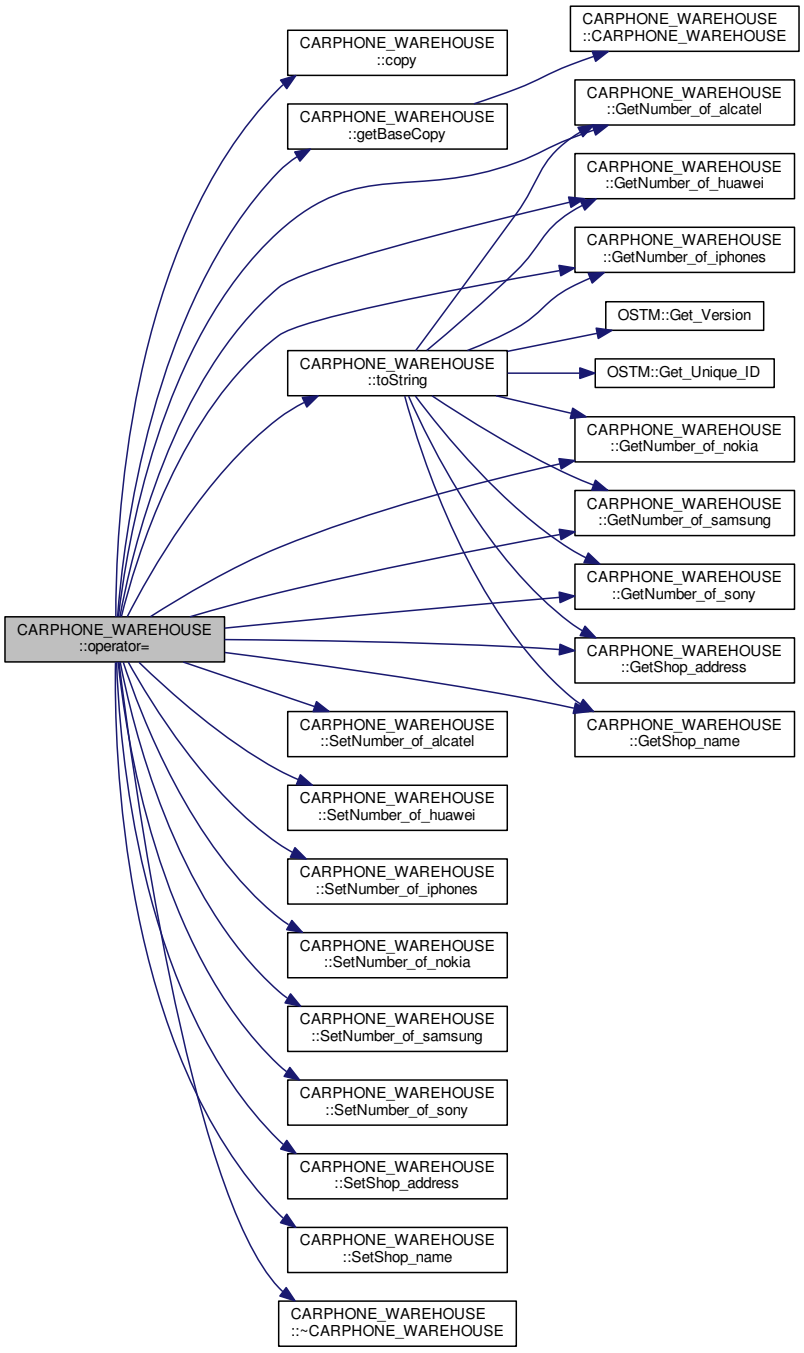
Operator

Definition at line 75 of file CARPHONE_WAREHOUSE.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~CARPHONE_WAREHOUSE().

```
00075 {};
```

Here is the call graph for this function:



5.6.3.12 void CARPHONE_WAREHOUSE::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 67 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00067                                                                    {
00068     this->_number_of_alcatel = _number_of_alcatel;
00069 }
```

5.6.3.13 void CARPHONE_WAREHOUSE::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 83 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00083                                                                    {
00084     this->_number_of_huawei = _number_of_huawei;
00085 }
```

5.6.3.14 void CARPHONE_WAREHOUSE::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 107 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00107                                                                    {
00108     this->_number_of_iphones = _number_of_iphones;
00109 }
```

5.6.3.15 void CARPHONE_WAREHOUSE::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 75 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00075                                                                    {
00076     this->_number_of_nokia = _number_of_nokia;
00077 }
```

5.6.3.16 void CARPHONE_WAREHOUSE::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 99 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00099                                                                    {
00100     this->_number_of_samsung = _number_of_samsung;
00101 }
```

5.6.3.17 void CARPHONE_WAREHOUSE::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 91 of file CARPHONE_WAREHOUSE.cpp.

References _number_of_sony.

Referenced by operator=().

```
00091                                                          {
00092     this->_number_of_sony = _number_of_sony;
00093 }
```

5.6.3.18 void CARPHONE_WAREHOUSE::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 123 of file CARPHONE_WAREHOUSE.cpp.

References _shop_address.

Referenced by operator=().

```
00123                                                          {
00124     this->_shop_address = _shop_address;
00125 }
```

5.6.3.19 void CARPHONE_WAREHOUSE::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 115 of file CARPHONE_WAREHOUSE.cpp.

References _shop_name.

Referenced by operator=().

```
00115                                                          {
00116     this->_shop_name = _shop_name;
00117 }
```

5.6.3.20 void CARPHONE_WAREHOUSE::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

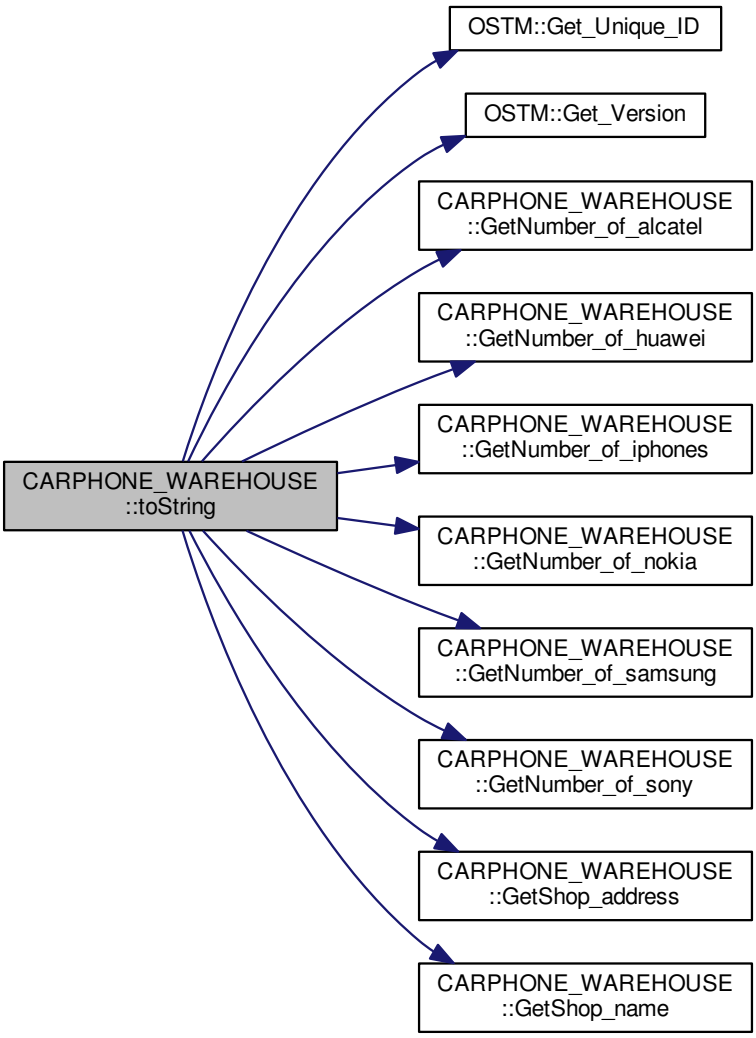
Definition at line 60 of file CARPHONE_WAREHOUSE.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), and GetShop_name().

Referenced by operator=().

```
00061 {
00062     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00063 }
```

Here is the call graph for this function:



5.6.4 Member Data Documentation

5.6.4.1 int CARPHONE_WAREHOUSE::_number_of_alcatel [private]

Definition at line 118 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_alcatel(), operator=(), and SetNumber_of_alcatel().

5.6.4.2 int CARPHONE_WAREHOUSE::_number_of_huawei [private]

Definition at line 116 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_huawei(), operator=(), and SetNumber_of_huawei().

5.6.4.3 int CARPHONE_WAREHOUSE::_number_of_iphones [private]

Definition at line 113 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_iphones(), operator=(), and SetNumber_of_iphones().

5.6.4.4 int CARPHONE_WAREHOUSE::_number_of_nokia [private]

Definition at line 117 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_nokia(), operator=(), and SetNumber_of_nokia().

5.6.4.5 int CARPHONE_WAREHOUSE::_number_of_samsung [private]

Definition at line 114 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_samsung(), operator=(), and SetNumber_of_samsung().

5.6.4.6 int CARPHONE_WAREHOUSE::_number_of_sony [private]

Definition at line 115 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetNumber_of_sony(), operator=(), and SetNumber_of_sony().

5.6.4.7 std::string CARPHONE_WAREHOUSE::_shop_address [private]

Definition at line 111 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), copy(), GetShop_address(), operator=(), and SetShop_address().

5.6.4.8 std::string CARPHONE_WAREHOUSE::_shop_name [private]

Definition at line 112 of file CARPHONE_WAREHOUSE.h.

Referenced by CARPHONE_WAREHOUSE(), GetShop_name(), operator=(), and SetShop_name().

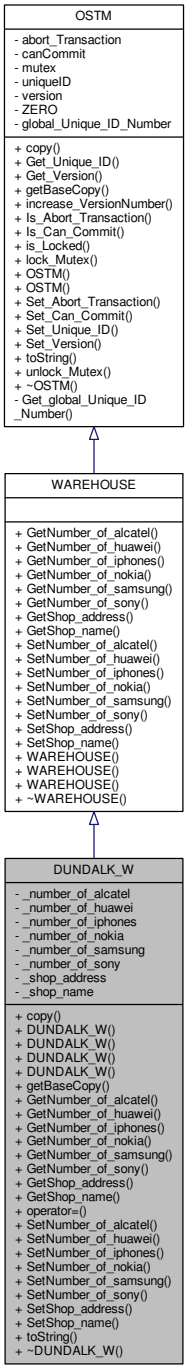
The documentation for this class was generated from the following files:

- CARPHONE_WAREHOUSE.h
- CARPHONE_WAREHOUSE.cpp

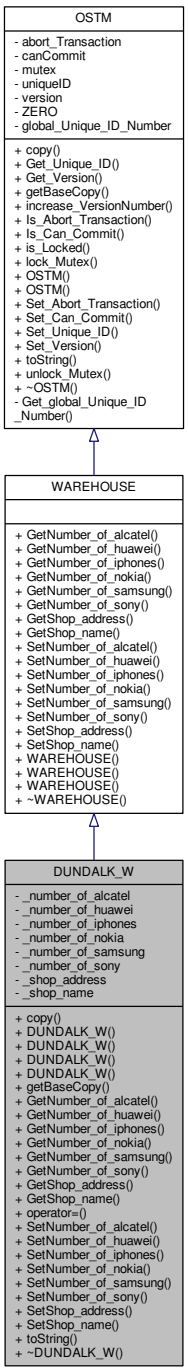
5.7 DUNDALK_W Class Reference

`#include <DUNDALK_W.h>`

Inheritance diagram for DUNDALK_W:



Collaboration diagram for DUNDALK_W:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- DUNDALK_W ()
- DUNDALK_W (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)

- DUNDALK_W (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- DUNDALK_W (const DUNDALK_W &orig)
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()
- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- DUNDALK_W operator= (const DUNDALK_W &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~DUNDALK_W ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.7.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file DUNDALK_W.h.

5.7.2 Constructor & Destructor Documentation

5.7.2.1 DUNDALK_W::DUNDALK_W ( ) [inline]

Constructor

Definition at line 24 of file DUNDALK_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by DUNDALK_W(), and getBaseCopy().

```
00024                 : WAREHOUSE(){
00025
00026         this->_shop_address = "Dundalk Busy Street";
00027         this->_shop_name = "DUNDALK D_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
```

5.7.2.2 DUNDALK_W::DUNDALK_W (std::string *address*, std::string *shop_name*, int *iphone*, int *samsung*, int *sony*, int *huawei*, int *nokia*, int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file DUNDALK_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                    : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.7.2.3 DUNDALK_W::DUNDALK_W (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file DUNDALK_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and DUNDALK_W().

```
00055                                                                    :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.7.2.4 DUNDALK_W::DUNDALK_W (const DUNDALK_W & *orig*)

Copy constructor

Definition at line 15 of file DUNDALK_W.cpp.

```
00015                                       {
00016 }
```

5.7.2.5 DUNDALK_W::~DUNDALK_W ( ) [virtual]

de-constructor

Definition at line 12 of file DUNDALK_W.cpp.

Referenced by operator=().

```
00012                         {
00013 }
```

5.7.3 Member Function Documentation

5.7.3.1 void DUNDALK_W::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 35 of file DUNDALK_W.cpp.

References _shop_address.

Referenced by operator=().

```
00035                                                                    {
00036
00037     std::shared_ptr<DUNDALK_W> objTO = std::dynamic_pointer_cast<DUNDALK_W>(to);
00038     std::shared_ptr<DUNDALK_W> objFROM = std::dynamic_pointer_cast<DUNDALK_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
```

5.7.3.2 std::shared_ptr< OSTM > DUNDALK_W::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

Definition at line 22 of file DUNDALK_W.cpp.

References DUNDALK_W().

Referenced by operator=().

```
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new DUNDALK_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
```

Here is the call graph for this function:

5.7.3.3 int DUNDALK_W::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 73 of file DUNDALK_W.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00073                                   {
00074     return _number_of_alcatel;
00075 }
```

5.7.3.4 int DUNDALK_W::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 89 of file DUNDALK_W.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00089                                   {
00090     return _number_of_huawei;
00091 }
```

5.7.3.5 int DUNDALK_W::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 113 of file DUNDALK_W.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00113                                   {
00114     return _number_of_iphones;
00115 }
```

5.7.3.6 int DUNDALK_W::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 81 of file DUNDALK_W.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00081                                {
00082     return _number_of_nokia;
00083 }
```

5.7.3.7 int DUNDALK_W::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 105 of file DUNDALK_W.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00105                                  {
00106     return _number_of_samsung;
00107 }
```

5.7.3.8 int DUNDALK_W::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 97 of file DUNDALK_W.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00097                                {
00098     return _number_of_sony;
00099 }
```

5.7.3.9 std::string DUNDALK_W::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 129 of file DUNDALK_W.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00129                                  {
00130     return _shop_address;
00131 }
```

5.7.3.10 std::string DUNDALK_W::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 121 of file DUNDALK_W.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00121                                {
00122     return _shop_name;
00123 }
```

5.7.3.11 DUNDALK_W DUNDALK_W::operator= (const DUNDALK_W & *orig*) [inline]

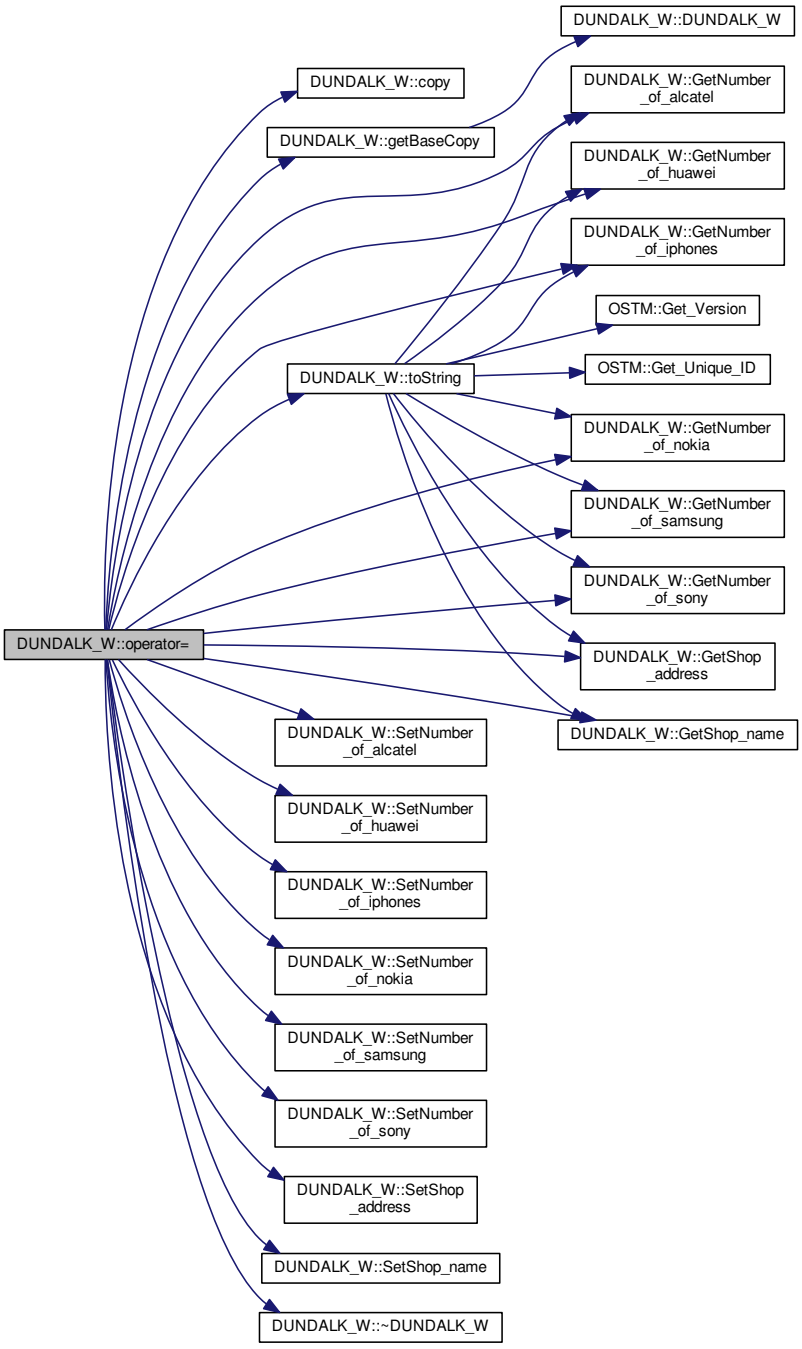
Operator

Definition at line 75 of file DUNDALK_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~DUNDALK_W().

```
00075 {};
```

Here is the call graph for this function:



5.7.3.12 void DUNDALK_W::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 69 of file DUNDALK_W.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00069                                                       {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
```

5.7.3.13 void DUNDALK_W::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 85 of file DUNDALK_W.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00085                                                       {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
```

5.7.3.14 void DUNDALK_W::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 109 of file DUNDALK_W.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00109                                                       {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
```

5.7.3.15 void DUNDALK_W::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 77 of file DUNDALK_W.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00077                                                       {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
```

5.7.3.16 void DUNDALK_W::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 101 of file DUNDALK_W.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00101                                                       {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
```

5.7.3.17 void DUNDALK_W::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 93 of file DUNDALK_W.cpp.

References _number_of_sony.

Referenced by operator=().

```
00093                                                   {
00094     this->_number_of_sony = _number_of_sony;
00095 }
```

5.7.3.18 void DUNDALK_W::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 125 of file DUNDALK_W.cpp.

References _shop_address.

Referenced by operator=().

```
00125                                                    {
00126     this->_shop_address = _shop_address;
00127 }
```

5.7.3.19 void DUNDALK_W::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 117 of file DUNDALK_W.cpp.

References _shop_name.

Referenced by operator=().

```
00117                                                {
00118     this->_shop_name = _shop_name;
00119 }
```

5.7.3.20 void DUNDALK_W::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

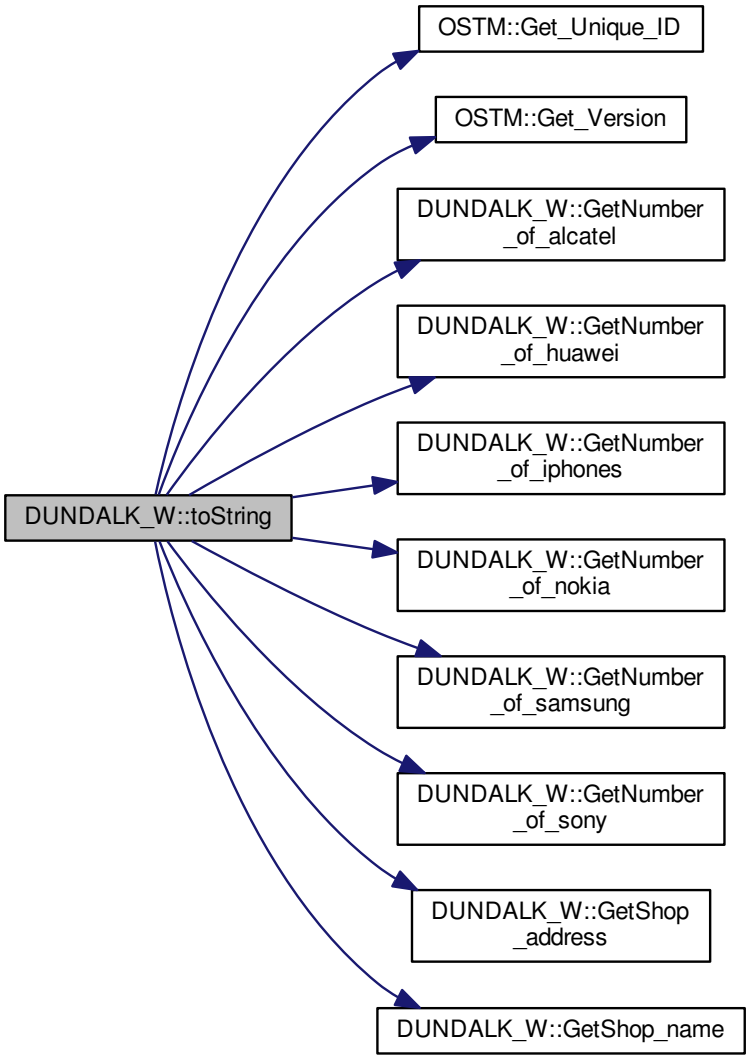
Definition at line 62 of file DUNDALK_W.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), and GetShop_name().

Referenced by operator=().

```
00063 {
00064     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
```

Here is the call graph for this function:



5.7.4 Member Data Documentation

5.7.4.1 int DUNDALK_W::_number_of_alcatel [private]

Definition at line 116 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_alcatel(), operator=(), and SetNumber_of_alcatel().

5.7.4.2 int DUNDALK_W::_number_of_huawei [private]

Definition at line 114 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_huawei(), operator=(), and SetNumber_of_huawei().

5.7.4.3 int DUNDALK_W::_number_of_iphones [private]

Definition at line 111 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_iphones(), operator=(), and SetNumber_of_iphones().

5.7.4.4 int DUNDALK_W::_number_of_nokia [private]

Definition at line 115 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_nokia(), operator=(), and SetNumber_of_nokia().

5.7.4.5 int DUNDALK_W::_number_of_samsung [private]

Definition at line 112 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_samsung(), operator=(), and SetNumber_of_samsung().

5.7.4.6 int DUNDALK_W::_number_of_sony [private]

Definition at line 113 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetNumber_of_sony(), operator=(), and SetNumber_of_sony().

5.7.4.7 std::string DUNDALK_W::_shop_address [private]

Definition at line 109 of file DUNDALK_W.h.

Referenced by copy(), DUNDALK_W(), GetShop_address(), operator=(), and SetShop_address().

5.7.4.8 std::string DUNDALK_W::_shop_name [private]

Definition at line 110 of file DUNDALK_W.h.

Referenced by DUNDALK_W(), GetShop_name(), operator=(), and SetShop_name().

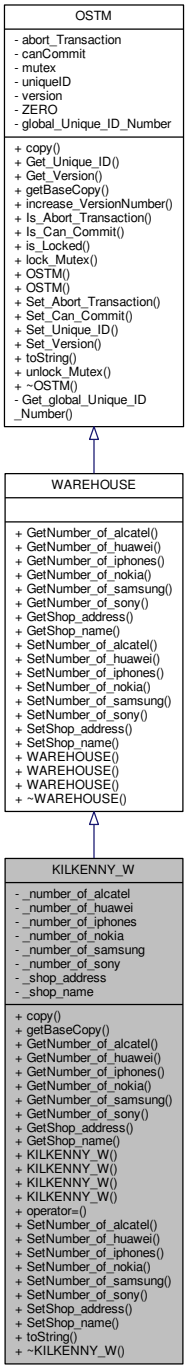
The documentation for this class was generated from the following files:

- DUNDALK_W.h
- DUNDALK_W.cpp

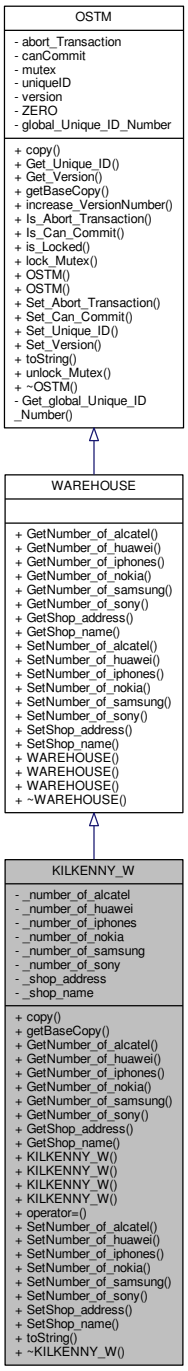
5.8 KILKENNY_W Class Reference

`#include <KILKENNY_W.h>`

Inheritance diagram for KILKENNY_W:



Collaboration diagram for KILKENNY_W:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()

- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- KILKENNY_W ()
- KILKENNY_W (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)
- KILKENNY_W (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- KILKENNY_W (const KILKENNY_W &orig)
- KILKENNY_W operator= (const KILKENNY_W &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~KILKENNY_W ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.8.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file KILKENNY_W.h.

5.8.2 Constructor & Destructor Documentation

5.8.2.1 KILKENNY_W::KILKENNY_W ( ) [inline]

Constructor

Definition at line 24 of file KILKENNY_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by getBaseCopy(), and KILKENNY_W().

```
00024                 : WAREHOUSE(){
00025
00026         this->_shop_address = "Kilkenny High Street";
00027         this->_shop_name = "KILKENNY K_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
```

5.8.2.2 KILKENNY_W::KILKENNY_W (std::string *address*, std::string *shop_name*, int *iphone*, int *samsung*, int *sony*, int *huawei*, int *nokia*, int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file KILKENNY_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                    : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.8.2.3 KILKENNY_W::KILKENNY_W (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file KILKENNY_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and KILKENNY_W().

```
00055                                                                        :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.8.2.4 KILKENNY_W::KILKENNY_W (const KILKENNY_W & *orig*)

Copy constructor

Definition at line 15 of file KILKENNY_W.cpp.

```
00015                                        {
00016 }
```

5.8.2.5 KILKENNY_W::~KILKENNY_W ( ) [virtual]

de-constructor

Definition at line 12 of file KILKENNY_W.cpp.

Referenced by operator=().

```
00012                          {
00013 }
```

5.8.3 Member Function Documentation

5.8.3.1 void KILKENNY_W::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 35 of file KILKENNY_W.cpp.

References _shop_address.

Referenced by operator=().

```
00035                                                                    {
00036
00037     std::shared_ptr<KILKENNY_W> objTO = std::dynamic_pointer_cast<KILKENNY_W>(to);
00038     std::shared_ptr<KILKENNY_W> objFROM = std::dynamic_pointer_cast<KILKENNY_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
```

5.8.3.2 std::shared_ptr< OSTM > KILKENNY_W::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

Definition at line 22 of file KILKENNY_W.cpp.

References KILKENNY_W().

Referenced by operator=().

```
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new KILKENNY_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
```

Here is the call graph for this function:

5.8.3.3 int KILKENNY_W::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 73 of file KILKENNY_W.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00073                                   {
00074     return _number_of_alcatel;
00075 }
```

5.8.3.4 int KILKENNY_W::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 89 of file KILKENNY_W.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00089                                   {
00090     return _number_of_huawei;
00091 }
```

5.8.3.5 int KILKENNY_W::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 113 of file KILKENNY_W.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00113                                   {
00114     return _number_of_iphones;
00115 }
```

5.8.3.6 int KILKENNY_W::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 81 of file KILKENNY_W.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00081                                {
00082     return _number_of_nokia;
00083 }
```

5.8.3.7 int KILKENNY_W::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 105 of file KILKENNY_W.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00105                                  {
00106     return _number_of_samsung;
00107 }
```

5.8.3.8 int KILKENNY_W::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 97 of file KILKENNY_W.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00097                                {
00098     return _number_of_sony;
00099 }
```

5.8.3.9 std::string KILKENNY_W::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 129 of file KILKENNY_W.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00129                                  {
00130     return _shop_address;
00131 }
```

5.8.3.10 std::string KILKENNY_W::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 121 of file KILKENNY_W.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00121                                   {
00122     return _shop_name;
00123 }
```

5.8.3.11 KILKENNY_W KILKENNY_W::operator= (const KILKENNY_W & *orig*) [inline]

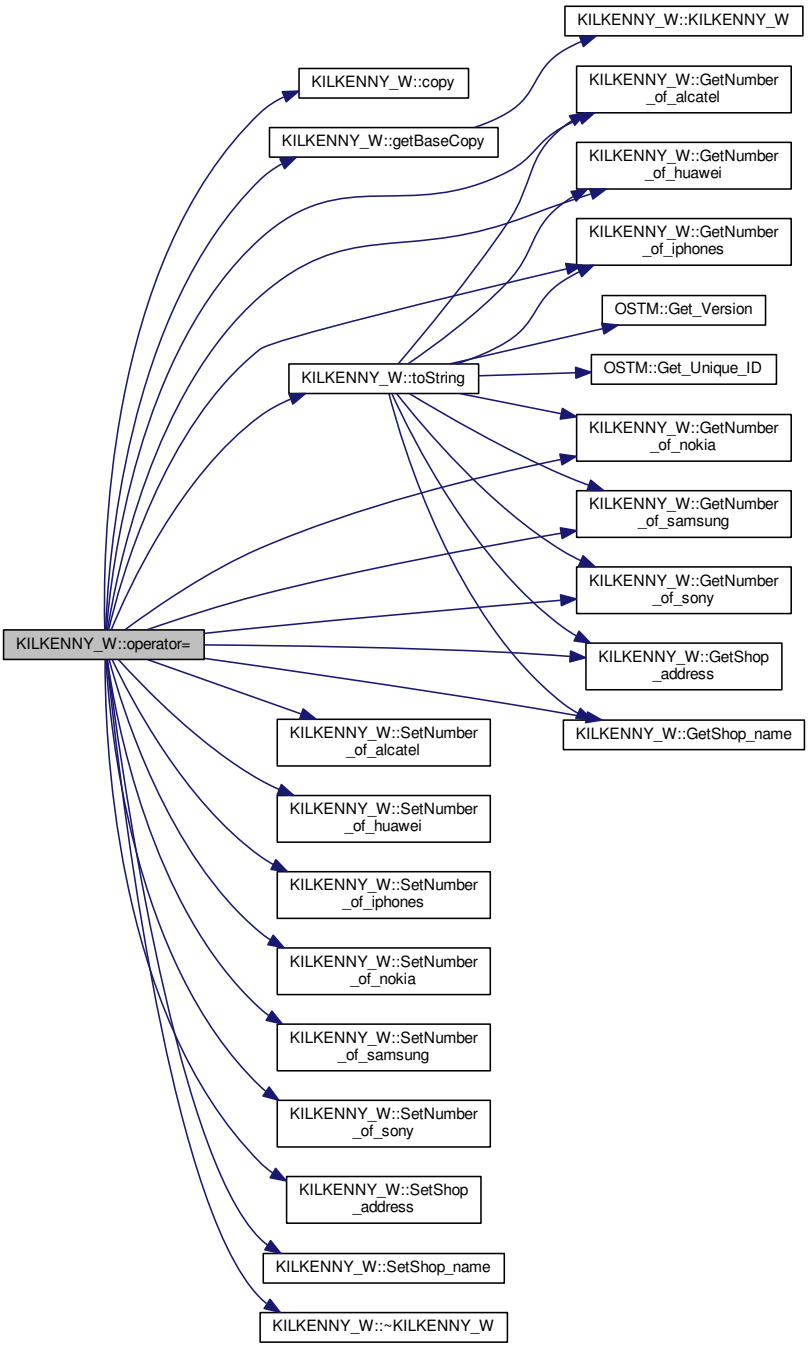
Operator

Definition at line 75 of file KILKENNY_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~KILKENNY_W().

```
00075 {};
```

Here is the call graph for this function:



5.8.3.12 void KILKENNY_W::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 69 of file KILKENNY_W.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00069                                                                   {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
```

5.8.3.13 void KILKENNY_W::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 85 of file KILKENNY_W.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00085                                                                   {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
```

5.8.3.14 void KILKENNY_W::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 109 of file KILKENNY_W.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00109                                                                   {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
```

5.8.3.15 void KILKENNY_W::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 77 of file KILKENNY_W.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00077                                                                   {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
```

5.8.3.16 void KILKENNY_W::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 101 of file KILKENNY_W.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00101                                                                   {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
```

5.8.3.17 void KILKENNY_W::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 93 of file KILKENNY_W.cpp.

References _number_of_sony.

Referenced by operator=().

```
00093                                                    {
00094     this->_number_of_sony = _number_of_sony;
00095 }
```

5.8.3.18 void KILKENNY_W::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 125 of file KILKENNY_W.cpp.

References _shop_address.

Referenced by operator=().

```
00125                                                     {
00126     this->_shop_address = _shop_address;
00127 }
```

5.8.3.19 void KILKENNY_W::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 117 of file KILKENNY_W.cpp.

References _shop_name.

Referenced by operator=().

```
00117                                                   {
00118     this->_shop_name = _shop_name;
00119 }
```

5.8.3.20 void KILKENNY_W::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

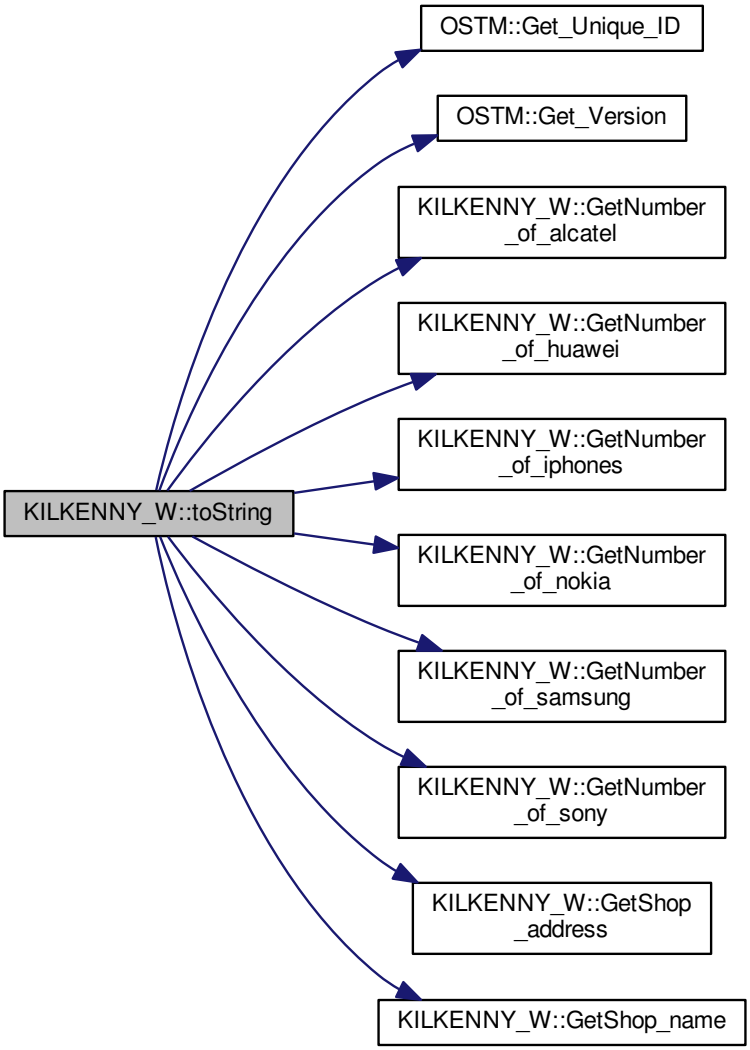
Definition at line 62 of file KILKENNY_W.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop↩_address(), and GetShop_name().

Referenced by operator=().

```
00063 {
00064     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
```

Here is the call graph for this function:



5.8.4 Member Data Documentation

5.8.4.1 int KILKENNY_W::_number_of_alcatel [private]

Definition at line 116 of file KILKENNY_W.h.

Referenced by GetNumber_of_alcatel(), KILKENNY_W(), operator=(), and SetNumber_of_alcatel().

5.8.4.2 int KILKENNY_W::_number_of_huawei [private]

Definition at line 114 of file KILKENNY_W.h.

Referenced by GetNumber_of_huawei(), KILKENNY_W(), operator=(), and SetNumber_of_huawei().

5.8.4.3 int KILKENNY_W::_number_of_iphones [private]

Definition at line 111 of file KILKENNY_W.h.

Referenced by GetNumber_of_iphones(), KILKENNY_W(), operator=(), and SetNumber_of_iphones().

5.8.4.4 int KILKENNY_W::_number_of_nokia [private]

Definition at line 115 of file KILKENNY_W.h.

Referenced by GetNumber_of_nokia(), KILKENNY_W(), operator=(), and SetNumber_of_nokia().

5.8.4.5 int KILKENNY_W::_number_of_samsung [private]

Definition at line 112 of file KILKENNY_W.h.

Referenced by GetNumber_of_samsung(), KILKENNY_W(), operator=(), and SetNumber_of_samsung().

5.8.4.6 int KILKENNY_W::_number_of_sony [private]

Definition at line 113 of file KILKENNY_W.h.

Referenced by GetNumber_of_sony(), KILKENNY_W(), operator=(), and SetNumber_of_sony().

5.8.4.7 std::string KILKENNY_W::_shop_address [private]

Definition at line 109 of file KILKENNY_W.h.

Referenced by copy(), GetShop_address(), KILKENNY_W(), operator=(), and SetShop_address().

5.8.4.8 std::string KILKENNY_W::_shop_name [private]

Definition at line 110 of file KILKENNY_W.h.

Referenced by GetShop_name(), KILKENNY_W(), operator=(), and SetShop_name().

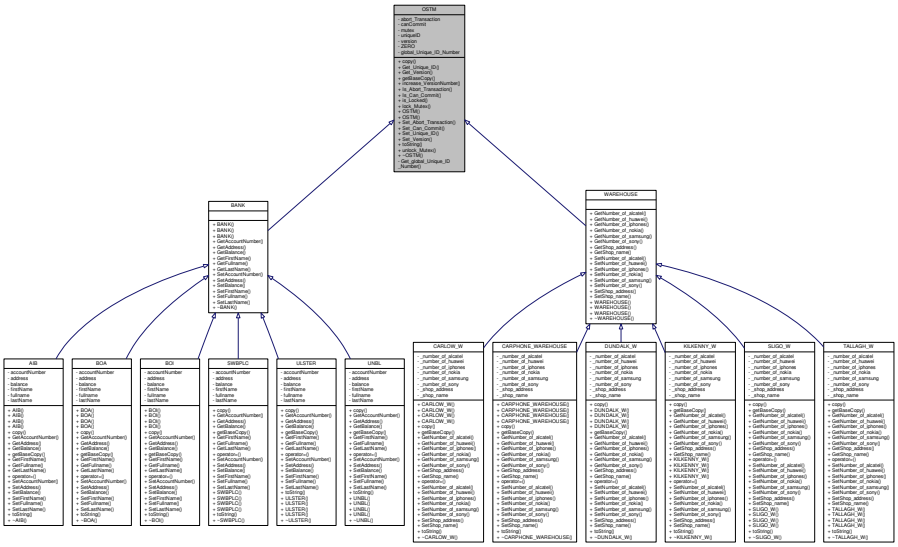
The documentation for this class was generated from the following files:

- KILKENNY_W.h
- KILKENNY_W.cpp

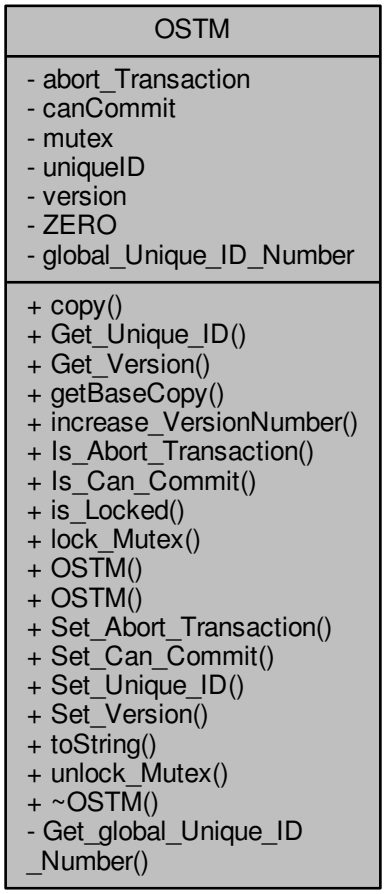
5.9 OSTM Class Reference

`#include <OSTM.h>`

Inheritance diagram for OSTM:



Collaboration diagram for OSTM:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > from, std::shared_ptr< OSTM > to)

  OSTM required virtual method for deep copy.
- int Get_Unique_ID () const

  getter for unique id
- int Get_Version () const

  getter for version number
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  OSTM required virtual method for returning a pointer that is copy of the original pointer.
- void increase_VersionNumber ()

  commit time increase version number to child object
- bool Is_Abort_Transaction () const

  NOT USED YET.
- bool Is_Can_Commit () const

  NOT USED YET.

- bool is_Locked ()
  object unique lock, try locks mutex return boolean value depends on the lock state
- void lock_Mutex ()
  object unique lock, locks mutex
- OSTM ()
  OSTM Constructor.
- OSTM (int _version_number_, int _unique_id_)
  OSTM Custom Constructor.
- void Set_Abort_Transaction (bool abortTransaction)
  NOT USED YET.
- void Set_Can_Commit (bool canCommit)
  NOT USED YET.
- void Set_Unique_ID (int uniqueID)
  setter for unique id
- void Set_Version (int version)
  setter for version number
- virtual void toString ()
  OSTM required virtual method for display object.
- void unlock_Mutex ()
  object unique lock, unlocks mutex
- virtual ~OSTM ()
  De-constructor.

Private Member Functions

- int Get_global_Unique_ID_Number ()

Private Attributes

- bool abort_Transaction
- bool canCommit
- std::mutex mutex
  Object built in lock.
- int uniqueID
- int version
- const int ZERO = 0
  Meaningful display for value 0.

Static Private Attributes

- static int global_Unique_ID_Number = 0
  Unique object number increase at object creation.

5.9.1 Detailed Description

Definition at line 17 of file OSTM.h.

5.9.2 Constructor & Destructor Documentation

5.9.2.1 OSTM::OSTM ( )

OSTM Constructor.

Default constructor.

Parameters

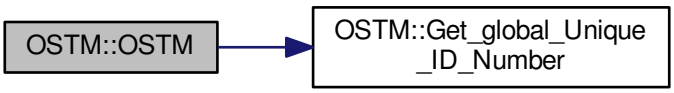
version	indicates the version number of the inherited child pointer
uniqueID	is a unique identifier assigned to every object registered in OSTM library
canCommit	NOT USED YET
abort_Transaction	NOT USED YET

Definition at line 20 of file OSTM.cpp.

References abort_Transaction, canCommit, Get_global_Unique_ID_Number(), uniqueID, version, and ZERO.

```
00021 {
00022     this->version = ZERO;
00023     this->uniqueID = Get_global_Unique_ID_Number(); //
      ++global_Unique_ID_Number;
00024     this->canCommit = true;
00025     this->abort_Transaction = false;
00026 }
```

Here is the call graph for this function:



5.9.2.2 OSTM::OSTM (int *_version_number_*, int *_unique_id_*)

OSTM Custom Constructor.

Custom Constructor Used for copy object.

Parameters

version	indicates the version number of the inherited child pointer
uniqueID	is a unique identifier assigned to every object registered in OSTM library
canCommit	NOT USED YET
abort_Transaction	NOT USED YET

Definition at line 36 of file OSTM.cpp.

References abort_Transaction, canCommit, uniqueID, and version.

```
00037 {
00038    // std::cout << "OSTM COPY CONSTRUCTOR" << global_Unique_ID_Number << std::endl;
00039     this->uniqueID = _unique_id_;
00040     this->version = _version_number_;
00041     this->canCommit = true;
00042     this->abort_Transaction = false;
00043 }
```

5.9.2.3 OSTM::~OSTM ( ) [virtual]

De-constructor.

De-constructor

Definition at line 48 of file OSTM.cpp.

```
00048             {
00049     //std::cout << "[OSTM DELETE]" << std::endl;
00050 }
```

5.9.3 Member Function Documentation

5.9.3.1 virtual void OSTM::copy (std::shared_ptr< OSTM > *from*, std::shared_ptr< OSTM > *to*) [inline], [virtual]

OSTM required virtual method for deep copy.

Reimplemented in SLIGO_W, TALLAGH_W, CARLOW_W, CARPHONE_WAREHOUSE, DUNDALK_W, KILKENNY_W, AIB, BOI, BOA, SWBPLC, ULSTER, and UNBL.

Definition at line 34 of file OSTM.h.

```
00034 {};
```

5.9.3.2 int OSTM::Get_global_Unique_ID_Number ( ) [private]

Returning global_Unique_ID_Number to the constructor

If global_Unique_ID_Number equals to 10000000 then reset back to ZERO, to make sure the value of global_Unique_ID_Number never exceed the MAX_INT value

Definition at line 56 of file OSTM.cpp.

References global_Unique_ID_Number.

Referenced by OSTM().

```
00056                                   {
00057     if(global_Unique_ID_Number > 10000000)
00058         global_Unique_ID_Number = 0;
00059     return ++global_Unique_ID_Number;
00060 }
```

5.9.3.3 int OSTM::Get_Unique_ID ( ) const

getter for unique id

Parameters

uniqueID	int

Definition at line 73 of file OSTM.cpp.

References uniqueID.

Referenced by toString(), ULSTER::toString(), UNBL::toString(), SWBPLC::toString(), BOA::toString(), BOI::to↩String(), AIB::toString(), KILKENNY_W::toString(), CARLOW_W::toString(), DUNDALK_W::toString(), SLIGO_W↩::toString(), TALLAGH_W::toString(), and CARPHONE_WAREHOUSE::toString().

```
00074 {
00075     return uniqueID;
00076 }
```

5.9.3.4 int OSTM::Get_Version ( ) const

getter for version number

Parameters

version	int

Definition at line 89 of file OSTM.cpp.

References version.

Referenced by toString(), ULSTER::toString(), UNBL::toString(), SWBPLC::toString(), BOA::toString(), BOI::to↩String(), AIB::toString(), KILKENNY_W::toString(), CARLOW_W::toString(), DUNDALK_W::toString(), SLIGO_W↩::toString(), TALLAGH_W::toString(), and CARPHONE_WAREHOUSE::toString().

```
00090 {
00091     return version;
00092 }
```

5.9.3.5 virtual std::shared_ptr<OSTM> OSTM::getBaseCopy (std::shared_ptr< OSTM > *object*) [inline], [virtual]

OSTM required virtual method for returning a pointer that is copy of the original pointer.

Reimplemented in SLIGO_W, TALLAGH_W, CARLOW_W, CARPHONE_WAREHOUSE, DUNDALK_W, KILKE↩NNY_W, AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 38 of file OSTM.h.

```
00038 {};//std::cout << "[OSTM GETBASECOPY]" << std::endl;};
```

5.9.3.6 void OSTM::increase_VersionNumber ( )

commit time increase version number to child object

Parameters

version	int

Definition at line 97 of file OSTM.cpp.

References version.

Referenced by toString().

```
00098 {
00099     this->version += 1;
00100 }
```

5.9.3.7 bool OSTM::Is_Abort_Transaction ( ) const

NOT USED YET.

Parameters

abort_Transaction	boolean

Definition at line 126 of file OSTM.cpp.

References abort_Transaction.

Referenced by toString().

```
00126                                    {
00127     return abort_Transaction;
00128 }
```

5.9.3.8 bool OSTM::Is_Can_Commit ( ) const

NOT USED YET.

Parameters

canCommit	boolean

Definition at line 112 of file OSTM.cpp.

References canCommit.

Referenced by toString().

```
00112                                {
00113     return canCommit;
00114 }
```

5.9.3.9 bool OSTM::is_Locked ( )

object unique lock, try locks mutex return boolean value depends on the lock state

Parameters

mutex	std::mutex

Definition at line 147 of file OSTM.cpp.

References mutex.

Referenced by toString().

```
00147                     {
00148     return this->mutex.try_lock();
00149 }
```

5.9.3.10 void OSTM::lock_Mutex ( )

object unique lock, locks mutex

Parameters

mutex	std::mutex

Definition at line 133 of file OSTM.cpp.

References mutex.

Referenced by toString().

```
00133                       {
00134     this->mutex.lock();
00135 }
```

5.9.3.11 void OSTM::Set_Abort_Transaction (bool *abortTransaction*)

NOT USED YET.

Parameters

abort_Transaction	boolean

Definition at line 119 of file OSTM.cpp.

References abort_Transaction.

Referenced by toString().

```
00119                                               {
00120     this->abort_Transaction = abortTransaction;
00121 }
```

5.9.3.12 void OSTM::Set_Can_Commit (bool *canCommit*)

NOT USED YET.

Parameters

canCommit	boolean

Definition at line 105 of file OSTM.cpp.

References canCommit.

Referenced by toString().

```
00105                                          {
00106     this->canCommit = canCommit;
00107 }
```

5.9.3.13 void OSTM::Set_Unique_ID (int *uniqueID*)

setter for unique id

Parameters

uniqueID	int

Definition at line 66 of file OSTM.cpp.

References uniqueID.

Referenced by ULSTER::copy(), UNBL::copy(), SWBPLC::copy(), BOA::copy(), AIB::copy(), BOI::copy(), and toString().

```
00066                                       {
00067     this->uniqueID = uniqueID;
00068 }
```

5.9.3.14 void OSTM::Set_Version (int *version*)

setter for version number

Parameters

version	int

Definition at line 81 of file OSTM.cpp.

References version.

Referenced by toString().

```
00082 {
00083     this->version = version;
00084 }
```

5.9.3.15 virtual void OSTM::toString ( ) [inline], [virtual]

OSTM required virtual method for display object.

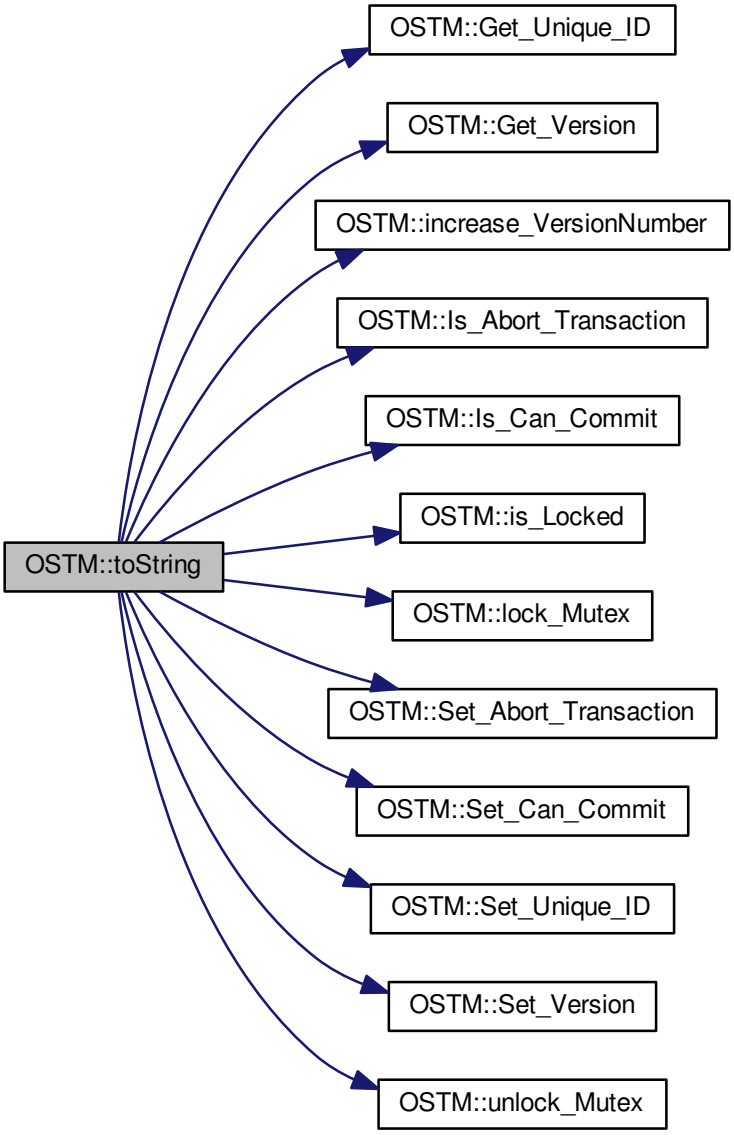
Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, KILKENNY_W, AIB, BOA, BOI, SWBPLC, ULSTER, and UNBL.

Definition at line 42 of file OSTM.h.

References canCommit, Get_Unique_ID(), Get_Version(), increase_VersionNumber(), Is_Abort_Transaction(), Is_Can_Commit(), is_Locked(), lock_Mutex(), Set_Abort_Transaction(), Set_Can_Commit(), Set_Unique_ID(), Set_Version(), uniqueID, unlock_Mutex(), and version.

```
00042 {};
```

Here is the call graph for this function:



5.9.3.16 void OSTM::unlock_Mutex ( )

object unique lock, unlocks mutex

Parameters

mutex	std::mutex

Definition at line 140 of file OSTM.cpp.

References mutex.

Referenced by toString().

```
00140                           {
00141     this->mutex.unlock();
00142 }
```

5.9.4 Member Data Documentation

5.9.4.1 bool OSTM::abort_Transaction [private]

Definition at line 108 of file OSTM.h.

Referenced by Is_Abort_Transaction(), OSTM(), and Set_Abort_Transaction().

5.9.4.2 bool OSTM::canCommit [private]

Definition at line 104 of file OSTM.h.

Referenced by Is_Can_Commit(), OSTM(), Set_Can_Commit(), and toString().

5.9.4.3 int OSTM::global_Unique_ID_Number = 0 [static], [private]

Unique object number increase at object creation.

Definition at line 112 of file OSTM.h.

Referenced by Get_global_Unique_ID_Number().

5.9.4.4 std::mutex OSTM::mutex [private]

Object built in lock.

Definition at line 120 of file OSTM.h.

Referenced by is_Locked(), lock_Mutex(), and unlock_Mutex().

5.9.4.5 int OSTM::uniqueID [private]

Definition at line 100 of file OSTM.h.

Referenced by Get_Unique_ID(), OSTM(), Set_Unique_ID(), and toString().

5.9.4.6 int OSTM::version [private]

Definition at line 96 of file OSTM.h.

Referenced by Get_Version(), increase_VersionNumber(), OSTM(), Set_Version(), and toString().

5.9.4.7 const int OSTM::ZERO = 0 [private]

Meaningful display for value 0.

Definition at line 116 of file OSTM.h.

Referenced by OSTM().

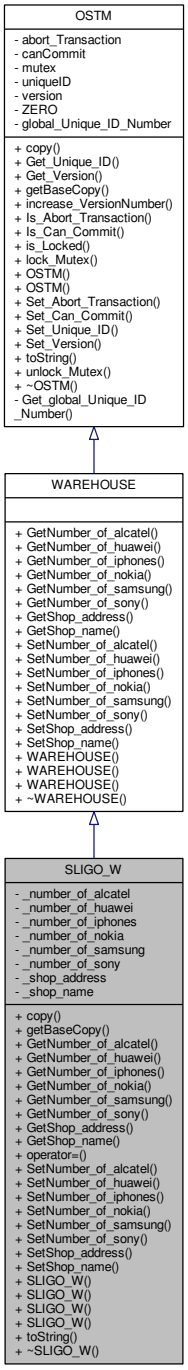
The documentation for this class was generated from the following files:

- OSTM.h
- OSTM.cpp

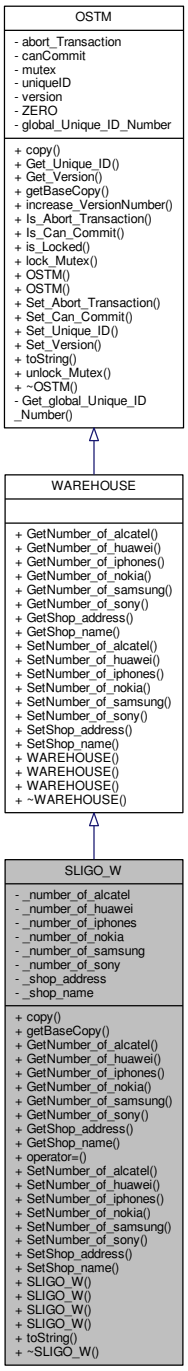
5.10 SLIGO_W Class Reference

```
#include <SLIGO_W.h>
```

Inheritance diagram for SLIGO_W:



Collaboration diagram for SLIGO_W:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()

- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- SLIGO_W operator= (const SLIGO_W &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- SLIGO_W ()
- SLIGO_W (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)
- SLIGO_W (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- SLIGO_W (const SLIGO_W &orig)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~SLIGO_W ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.10.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file SLIGO_W.h.

5.10.2 Constructor & Destructor Documentation

5.10.2.1 SLIGO_W::SLIGO_W ( ) [inline]

Constructor

Definition at line 24 of file SLIGO_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by getBaseCopy(), and SLIGO_W().

```
00024               : WAREHOUSE(){
00025
00026         this->_shop_address = "Sligo River Street";
00027         this->_shop_name = "SLIGO S_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
```

5.10.2.2 SLIGO_W::SLIGO_W (std::string *address*, std::string *shop_name*, int *iphone*, int *samsung*, int *sony*, int *huawei*, int *nokia*, int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file SLIGO_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                    : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.10.2.3 SLIGO_W::SLIGO_W (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file SLIGO_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and SLIGO_W().

```
00055                                                                    :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.10.2.4 SLIGO_W::SLIGO_W (const SLIGO_W & *orig*)

Copy constructor

Definition at line 15 of file SLIGO_W.cpp.

```
00015                                  {
00016 }
```

5.10.2.5 SLIGO_W::~SLIGO_W ( ) [virtual]

de-constructor

Definition at line 12 of file SLIGO_W.cpp.

Referenced by operator=().

```
00012                   {
00013 }
```

5.10.3 Member Function Documentation

5.10.3.1 void SLIGO_W::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 35 of file SLIGO_W.cpp.

References _shop_address.

Referenced by operator=().

```
00035                                                                    {
00036
00037     std::shared_ptr<SLIGO_W> objTO = std::dynamic_pointer_cast<SLIGO_W>(to);
00038     std::shared_ptr<SLIGO_W> objFROM = std::dynamic_pointer_cast<SLIGO_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
```

5.10.3.2 std::shared_ptr< OSTM > SLIGO_W::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

Definition at line 22 of file SLIGO_W.cpp.

References SLIGO_W().

Referenced by operator=().

```
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new SLIGO_W(objTO, object->Get_Version(),object->Get_Unique_ID())
      );
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00028     return ostm_obj;
00029 }
```

Here is the call graph for this function:

5.10.3.3 int SLIGO_W::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 73 of file SLIGO_W.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00073                                {
00074     return _number_of_alcatel;
00075 }
```

5.10.3.4 int SLIGO_W::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 89 of file SLIGO_W.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00089                               {
00090     return _number_of_huawei;
00091 }
```

5.10.3.5 int SLIGO_W::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 113 of file SLIGO_W.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00113                                {
00114     return _number_of_iphones;
00115 }
```

5.10.3.6 int SLIGO_W::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 81 of file SLIGO_W.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00081                                {
00082     return _number_of_nokia;
00083 }
```

5.10.3.7 int SLIGO_W::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 105 of file SLIGO_W.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00105                                  {
00106     return _number_of_samsung;
00107 }
```

5.10.3.8 int SLIGO_W::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 97 of file SLIGO_W.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00097                                {
00098     return _number_of_sony;
00099 }
```

5.10.3.9 std::string SLIGO_W::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 129 of file SLIGO_W.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00129                                  {
00130     return _shop_address;
00131 }
```

5.10.3.10 std::string SLIGO_W::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 121 of file SLIGO_W.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00121                                {
00122     return _shop_name;
00123 }
```

5.10.3.11 SLIGO_W SLIGO_W::operator= (const SLIGO_W & *orig*) [inline]

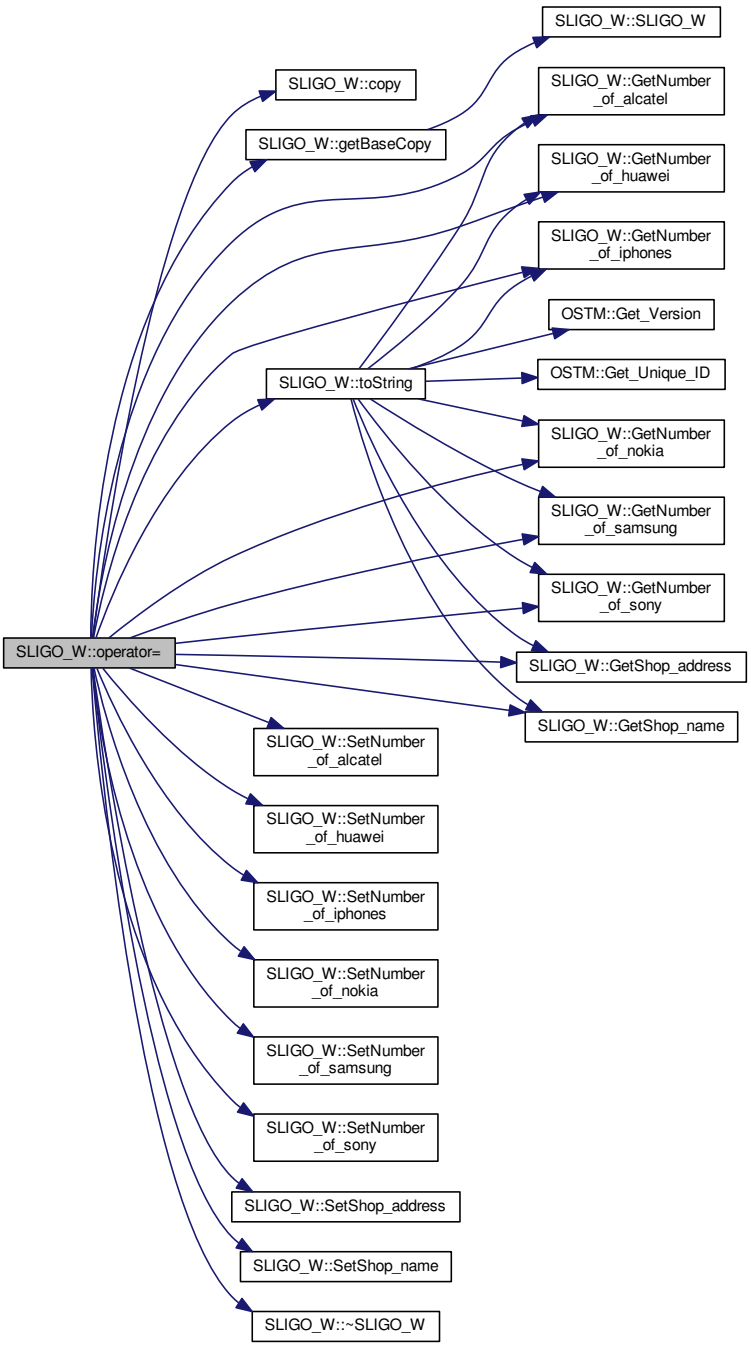
Operator

Definition at line 75 of file SLIGO_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~SLIGO_W().

```
00075 {};
```

Here is the call graph for this function:



5.10.3.12 void SLIGO_W::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 69 of file SLIGO_W.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00069                                                   {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
```

5.10.3.13 void SLIGO_W::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 85 of file SLIGO_W.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00085                                                   {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
```

5.10.3.14 void SLIGO_W::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 109 of file SLIGO_W.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00109                                                   {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
```

5.10.3.15 void SLIGO_W::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 77 of file SLIGO_W.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00077                                                   {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
```

5.10.3.16 void SLIGO_W::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 101 of file SLIGO_W.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00101                                                   {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
```

5.10.3.17 void SLIGO_W::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 93 of file SLIGO_W.cpp.

References _number_of_sony.

Referenced by operator=().

```
00093                                                 {
00094     this->_number_of_sony = _number_of_sony;
00095 }
```

5.10.3.18 void SLIGO_W::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 125 of file SLIGO_W.cpp.

References _shop_address.

Referenced by operator=().

```
00125                                                   {
00126     this->_shop_address = _shop_address;
00127 }
```

5.10.3.19 void SLIGO_W::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 117 of file SLIGO_W.cpp.

References _shop_name.

Referenced by operator=().

```
00117                                               {
00118     this->_shop_name = _shop_name;
00119 }
```

5.10.3.20 void SLIGO_W::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

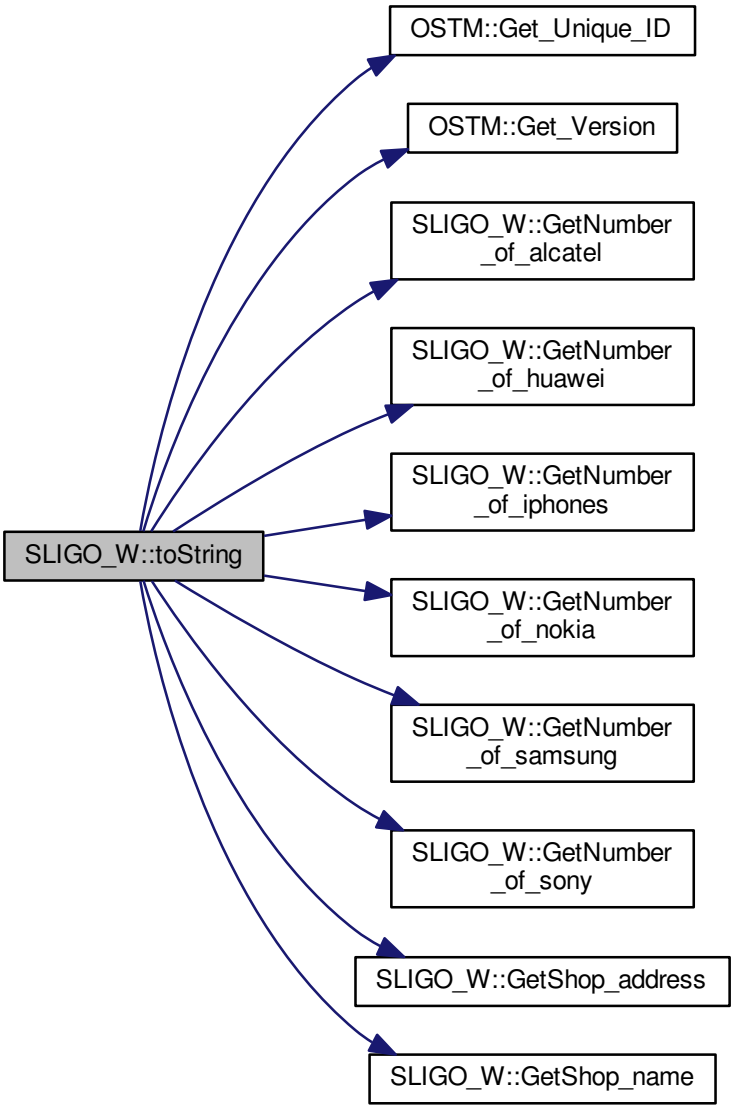
Definition at line 62 of file SLIGO_W.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), and GetShop_name().

Referenced by operator=().

```
00063 {
00064     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
```

Here is the call graph for this function:



5.10.4 Member Data Documentation

5.10.4.1 int SLIGO_W::_number_of_alcatel [private]

Definition at line 117 of file SLIGO_W.h.

Referenced by GetNumber_of_alcatel(), operator=(), SetNumber_of_alcatel(), and SLIGO_W().

5.10.4.2 int SLIGO_W::_number_of_huawei [private]

Definition at line 115 of file SLIGO_W.h.

Referenced by GetNumber_of_huawei(), operator=(), SetNumber_of_huawei(), and SLIGO_W().

5.10.4.3 int SLIGO_W::_number_of_iphones [private]

Definition at line 112 of file SLIGO_W.h.

Referenced by GetNumber_of_iphones(), operator=(), SetNumber_of_iphones(), and SLIGO_W().

5.10.4.4 int SLIGO_W::_number_of_nokia [private]

Definition at line 116 of file SLIGO_W.h.

Referenced by GetNumber_of_nokia(), operator=(), SetNumber_of_nokia(), and SLIGO_W().

5.10.4.5 int SLIGO_W::_number_of_samsung [private]

Definition at line 113 of file SLIGO_W.h.

Referenced by GetNumber_of_samsung(), operator=(), SetNumber_of_samsung(), and SLIGO_W().

5.10.4.6 int SLIGO_W::_number_of_sony [private]

Definition at line 114 of file SLIGO_W.h.

Referenced by GetNumber_of_sony(), operator=(), SetNumber_of_sony(), and SLIGO_W().

5.10.4.7 std::string SLIGO_W::_shop_address [private]

Definition at line 110 of file SLIGO_W.h.

Referenced by copy(), GetShop_address(), operator=(), SetShop_address(), and SLIGO_W().

5.10.4.8 std::string SLIGO_W::_shop_name [private]

Definition at line 111 of file SLIGO_W.h.

Referenced by GetShop_name(), operator=(), SetShop_name(), and SLIGO_W().

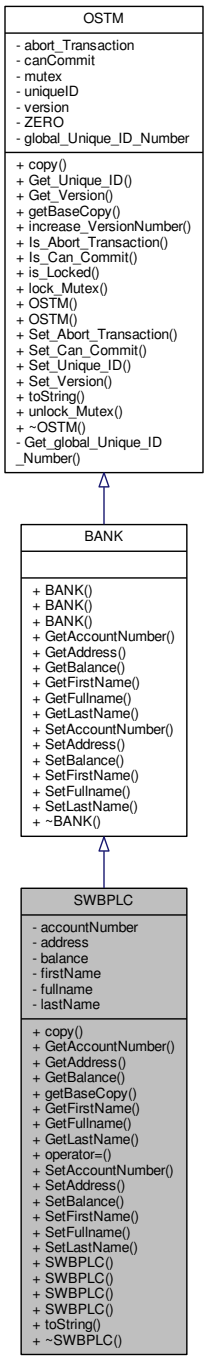
The documentation for this class was generated from the following files:

- SLIGO_W.h
- SLIGO_W.cpp

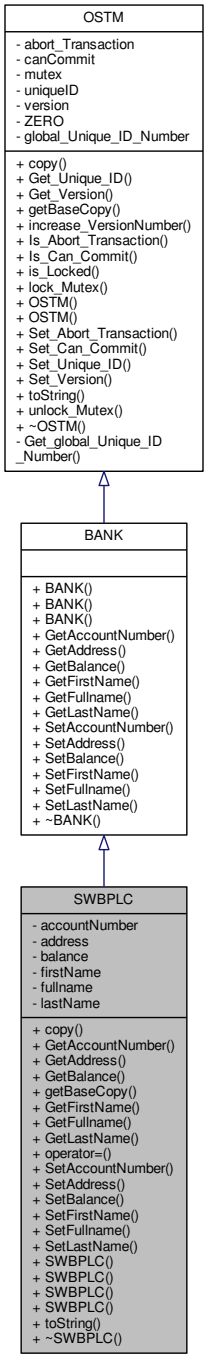
5.11 SWBPLC Class Reference

`#include <SWBPLC.h>`

Inheritance diagram for SWBPLC:



Collaboration diagram for SWBPLC:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const

- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- SWBPLC operator= (const SWBPLC &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- SWBPLC ()
- SWBPLC (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- SWBPLC (std::shared_ptr< BANK > obj, int _version, int _unique_id)
- SWBPLC (const SWBPLC &orig)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~SWBPLC ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.11.1 Detailed Description

Inherit from BANK

Definition at line 19 of file SWBPLC.h.

5.11.2 Constructor & Destructor Documentation

5.11.2.1 SWBPLC::SWBPLC ( ) [inline]

Constructor

Definition at line 24 of file SWBPLC.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by getBaseCopy(), and SWBPLC().

```
00024             : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
```

5.11.2.2 SWBPLC::SWBPLC (int *accountNumber,* double *balance,* std::string *firstName,* std::string *lastName,* std::string *address*) [inline]

Custom constructor

Definition at line 35 of file SWBPLC.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00035                                                                                                         :
       BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
```

5.11.2.3 SWBPLC::SWBPLC (std::shared_ptr< BANK > *obj,* int *_version,* int *_unique_id*) [inline]

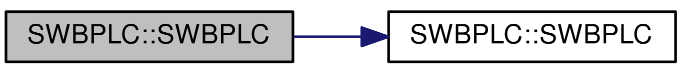
Custom constructor, used by the library for deep copying

Definition at line 46 of file SWBPLC.h.

References accountNumber, address, balance, firstName, fullname, lastName, and SWBPLC().

```
00046                                                         : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054
00055     };
```

Here is the call graph for this function:



5.11.2.4 SWBPLC::SWBPLC (const SWBPLC & *orig*)

Copy constructor

Definition at line 12 of file SWBPLC.cpp.

```
00012                                {
00013 }
```

5.11.2.5 SWBPLC::~SWBPLC ( ) [virtual]

de-constructor

Definition at line 15 of file SWBPLC.cpp.

Referenced by operator=().

```
00015                {
00016 }
```

5.11.3 Member Function Documentation

5.11.3.1 void SWBPLC::copy (std::shared_ptr< OSTM > *to*, std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>
objFROM	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

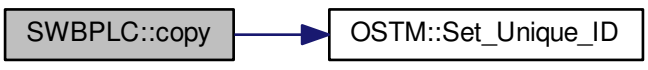
Definition at line 34 of file SWBPLC.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00034                                                                {
00035
00036     std::shared_ptr<SWBPLC> objTO = std::dynamic_pointer_cast<SWBPLC>(to);
00037     std::shared_ptr<SWBPLC> objFROM = std::dynamic_pointer_cast<SWBPLC>(from);
00038     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00039     objTO->Set_Version(objFROM->Get_Version());
00040     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00041     objTO->SetBalance(objFROM->GetBalance());
00042
00043
00044 }
```

Here is the call graph for this function:



5.11.3.2 int SWBPLC::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 80 of file SWBPLC.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00080                                   {
00081     return accountNumber;
00082 }
```

5.11.3.3 std::string SWBPLC::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 64 of file SWBPLC.cpp.

References address.

Referenced by operator=().

```
00064                                   {
00065     return address;
00066 }
```

5.11.3.4 double SWBPLC::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 72 of file SWBPLC.cpp.

References balance.

Referenced by operator=(), and toString().

```
00072                                  {
00073     return balance;
00074 }
```

5.11.3.5 std::shared_ptr< OSTM > SWBPLC::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a std::shared_ptr<BANK> return type

Reimplemented from OSTM.

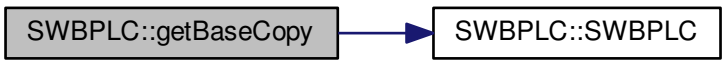
Definition at line 22 of file SWBPLC.cpp.

References SWBPLC().

Referenced by operator=().

```
00023 {
00024     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00025     std::shared_ptr<BANK> obj(new SWBPLC(objTO,object->Get_Version(),object->Get_Unique_ID()));
00026     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00027     return ostm_obj;
00028 }
```

Here is the call graph for this function:



5.11.3.6 std::string SWBPLC::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 96 of file SWBPLC.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00096                                   {
00097     return firstName;
00098 }
```

5.11.3.7 std::string SWBPLC::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 104 of file SWBPLC.cpp.

References fullname.

Referenced by operator=().

```
00104                                   {
00105     return fullname;
00106 }
```

5.11.3.8 std::string SWBPLC::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 88 of file SWBPLC.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00088                                   {
00089     return lastName;
00090 }
```

5.11.3.9 SWBPLC SWBPLC::operator= (const SWBPLC & *orig*) [inline]

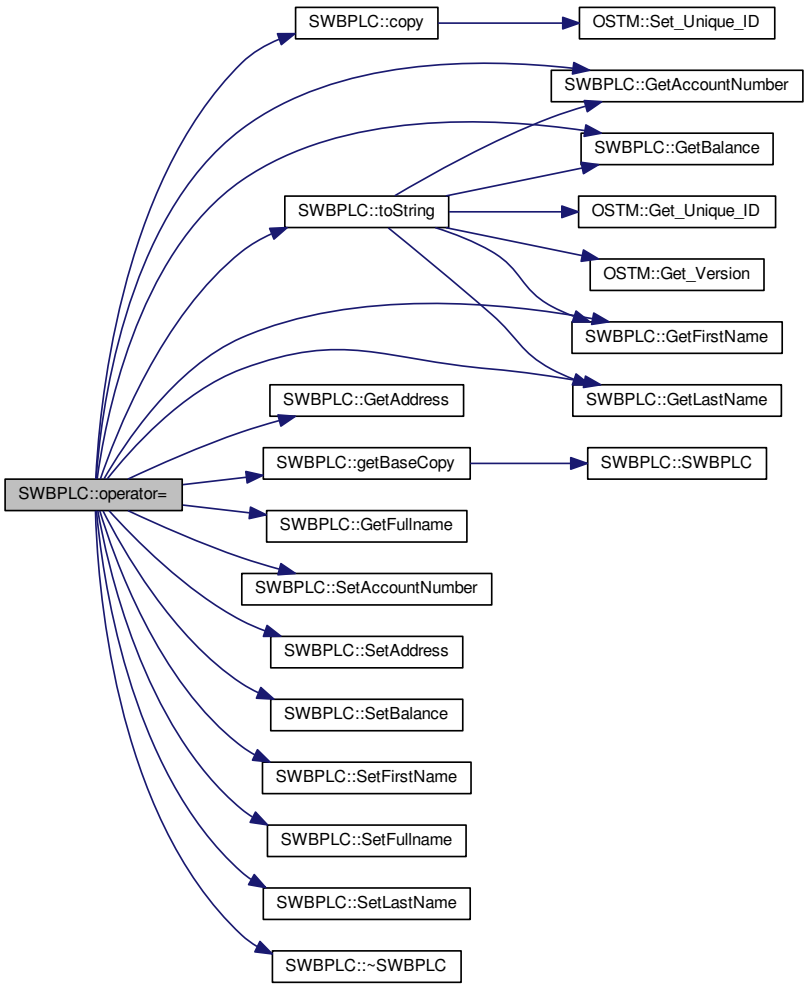
Operator

Definition at line 63 of file SWBPLC.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~SWBPLC().

```
00063 {};
```

Here is the call graph for this function:



5.11.3.10 void SWBPLC::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 76 of file SWBPLC.cpp.

References accountNumber.

Referenced by operator=().

```
00076                                               {
00077     this->accountNumber = accountNumber;
00078 }
```

5.11.3.11 void SWBPLC::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 60 of file SWBPLC.cpp.

References address.

Referenced by operator=().

```
00060                                          {
00061     this->address = address;
00062 }
```

5.11.3.12 void SWBPLC::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 68 of file SWBPLC.cpp.

References balance.

Referenced by operator=().

```
00068                                        {
00069     this->balance = balance;
00070 }
```

5.11.3.13 void SWBPLC::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 92 of file SWBPLC.cpp.

References firstName.

Referenced by operator=().

```
00092                                            {
00093     this->firstName = firstName;
00094 }
```

5.11.3.14 void SWBPLC::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 100 of file SWBPLC.cpp.

References fullname.

Referenced by operator=().

```
00100                                           {
00101     this->fullname = fullname;
00102 }
```

5.11.3.15 void SWBPLC::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 84 of file SWBPLC.cpp.

References lastName.

Referenced by operator=().

```
00084                                           {
00085     this->lastName = lastName;
00086 }
```

5.11.3.16 void SWBPLC::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

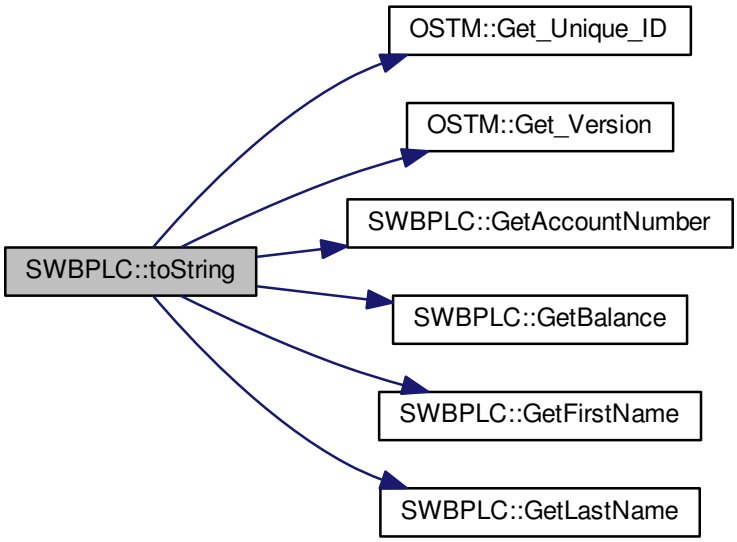
Definition at line 55 of file SWBPLC.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00056 {
00057      std::cout << "\nSWBPLC BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt
       account : " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00058 }
```

Here is the call graph for this function:



5.11.4 Member Data Documentation

5.11.4.1 int SWBPLC::accountNumber [private]

Definition at line 96 of file SWBPLC.h.

Referenced by GetAccountNumber(), operator=(), SetAccountNumber(), and SWBPLC().

5.11.4.2 std::string SWBPLC::address [private]

Definition at line 98 of file SWBPLC.h.

Referenced by GetAddress(), operator=(), SetAddress(), and SWBPLC().

5.11.4.3 double SWBPLC::balance [private]

Definition at line 97 of file SWBPLC.h.

Referenced by GetBalance(), operator=(), SetBalance(), and SWBPLC().

5.11.4.4 std::string SWBPLC::firstName [private]

Definition at line 94 of file SWBPLC.h.

Referenced by GetFirstName(), operator=(), SetFirstName(), and SWBPLC().

5.11.4.5 std::string SWBPLC::fullname [private]

Definition at line 93 of file SWBPLC.h.

Referenced by GetFullname(), operator=(), SetFullname(), and SWBPLC().

5.11.4.6 std::string SWBPLC::lastName [private]

Definition at line 95 of file SWBPLC.h.

Referenced by GetLastName(), operator=(), SetLastName(), and SWBPLC().

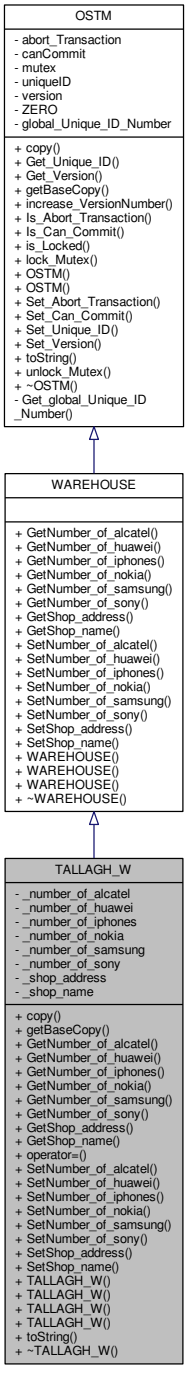
The documentation for this class was generated from the following files:

- SWBPLC.h
- SWBPLC.cpp

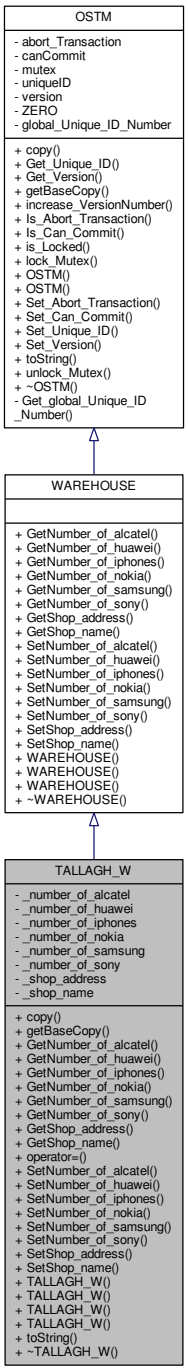
5.12 TALLAGH_W Class Reference

```
#include <TALLAGH_W.h>
```

Inheritance diagram for TALLAGH_W:



Collaboration diagram for TALLAGH_W:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object
- virtual int GetNumber_of_alcatel ()

- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()
- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- TALLAGH_W operator= (const TALLAGH_W &orig)
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- TALLAGH_W ()
- TALLAGH_W (std::string address, std::string shop_name, int iphone, int samsung, int sony, int huawei, int nokia, int alcatel)
- TALLAGH_W (std::shared_ptr< WAREHOUSE > obj, int _version, int _unique_id)
- TALLAGH_W (const TALLAGH_W &orig)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- virtual ~TALLAGH_W ()

Private Attributes

- int _number_of_alcatel
- int _number_of_huawei
- int _number_of_iphones
- int _number_of_nokia
- int _number_of_samsung
- int _number_of_sony
- std::string _shop_address
- std::string _shop_name

5.12.1 Detailed Description

Inherit from WAREHOUSE

Definition at line 19 of file TALLAGH_W.h.

5.12.2 Constructor & Destructor Documentation

5.12.2.1 TALLAGH_W::TALLAGH_W ( ) [inline]

Constructor

Definition at line 24 of file TALLAGH_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_↩ samsung, _number_of_sony, _shop_address, and _shop_name.

Referenced by getBaseCopy(), and TALLAGH_W().

```
00024                 : WAREHOUSE(){
00025
00026         this->_shop_address = "Tallagh Low street";
00027         this->_shop_name = "TALLAGH T_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
```

5.12.2.2 TALLAGH_W::TALLAGH_W (std::string *address,* std::string *shop_name,* int *iphone,* int *samsung,* int *sony,* int *huawei,* int *nokia,* int *alcatel*) [inline]

Custom constructor

Definition at line 38 of file TALLAGH_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_↩ samsung, _number_of_sony, _shop_address, and _shop_name.

```
00038
                      : WAREHOUSE(){
00039         /*
00040          * copy over values

00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
```

5.12.2.3 TALLAGH_W::TALLAGH_W (std::shared_ptr< WAREHOUSE > *obj,* int *_version,* int *_unique_id*) [inline]

Custom constructor, used by the library for deep copying

Definition at line 55 of file TALLAGH_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, and TALLAGH_W().

```
00055                                                                    :
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values

00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
```

Here is the call graph for this function:

5.12.2.4 TALLAGH_W::TALLAGH_W (const TALLAGH_W & *orig*)

Copy constructor

Definition at line 15 of file TALLAGH_W.cpp.

```
00015                                       {
00016 }
```

5.12.2.5 TALLAGH_W::~TALLAGH_W ( ) [virtual]

de-constructor

Definition at line 12 of file TALLAGH_W.cpp.

Referenced by operator=().

```
00012                         {
00013 }
```

5.12.3 Member Function Documentation

5.12.3.1 void TALLAGH_W::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a BANK∗ type object casted back from std::shared_ptr<OSTM>
objFROM	is a BANK∗ type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

Definition at line 35 of file TALLAGH_W.cpp.

References _shop_address.

Referenced by operator=().

```
00035                                                                    {
00036
00037     std::shared_ptr<TALLAGH_W> objTO = std::dynamic_pointer_cast<TALLAGH_W>(to);
00038     std::shared_ptr<TALLAGH_W> objFROM = std::dynamic_pointer_cast<TALLAGH_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
```

5.12.3.2 std::shared_ptr< OSTM > TALLAGH_W::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new BANK∗ type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a BANK∗ return type

Reimplemented from OSTM.

Definition at line 22 of file TALLAGH_W.cpp.

References TALLAGH_W().

Referenced by operator=().

```
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new TALLAGH_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00028     return ostm_obj;
00029 }
```

Here is the call graph for this function:

5.12.3.3 int TALLAGH_W::GetNumber_of_alcatel ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 71 of file TALLAGH_W.cpp.

References _number_of_alcatel.

Referenced by operator=(), and toString().

```
00071                                   {
00072     return _number_of_alcatel;
00073 }
```

5.12.3.4 int TALLAGH_W::GetNumber_of_huawei ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 87 of file TALLAGH_W.cpp.

References _number_of_huawei.

Referenced by operator=(), and toString().

```
00087                                   {
00088     return _number_of_huawei;
00089 }
```

5.12.3.5 int TALLAGH_W::GetNumber_of_iphones ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 111 of file TALLAGH_W.cpp.

References _number_of_iphones.

Referenced by operator=(), and toString().

```
00111                                   {
00112     return _number_of_iphones;
00113 }
```

5.12.3.6 int TALLAGH_W::GetNumber_of_nokia ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 79 of file TALLAGH_W.cpp.

References _number_of_nokia.

Referenced by operator=(), and toString().

```
00079                                {
00080     return _number_of_nokia;
00081 }
```

5.12.3.7 int TALLAGH_W::GetNumber_of_samsung ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 103 of file TALLAGH_W.cpp.

References _number_of_samsung.

Referenced by operator=(), and toString().

```
00103                                  {
00104     return _number_of_samsung;
00105 }
```

5.12.3.8 int TALLAGH_W::GetNumber_of_sony ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 95 of file TALLAGH_W.cpp.

References _number_of_sony.

Referenced by operator=(), and toString().

```
00095                               {
00096     return _number_of_sony;
00097 }
```

5.12.3.9 std::string TALLAGH_W::GetShop_address ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 127 of file TALLAGH_W.cpp.

References _shop_address.

Referenced by operator=(), and toString().

```
00127                                   {
00128     return _shop_address;
00129 }
```

5.12.3.10 std::string TALLAGH_W::GetShop_name ( ) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 119 of file TALLAGH_W.cpp.

References _shop_name.

Referenced by operator=(), and toString().

```
00119                                {
00120     return _shop_name;
00121 }
```

5.12.3.11 TALLAGH_W TALLAGH_W::operator= (const TALLAGH_W & *orig*) [inline]

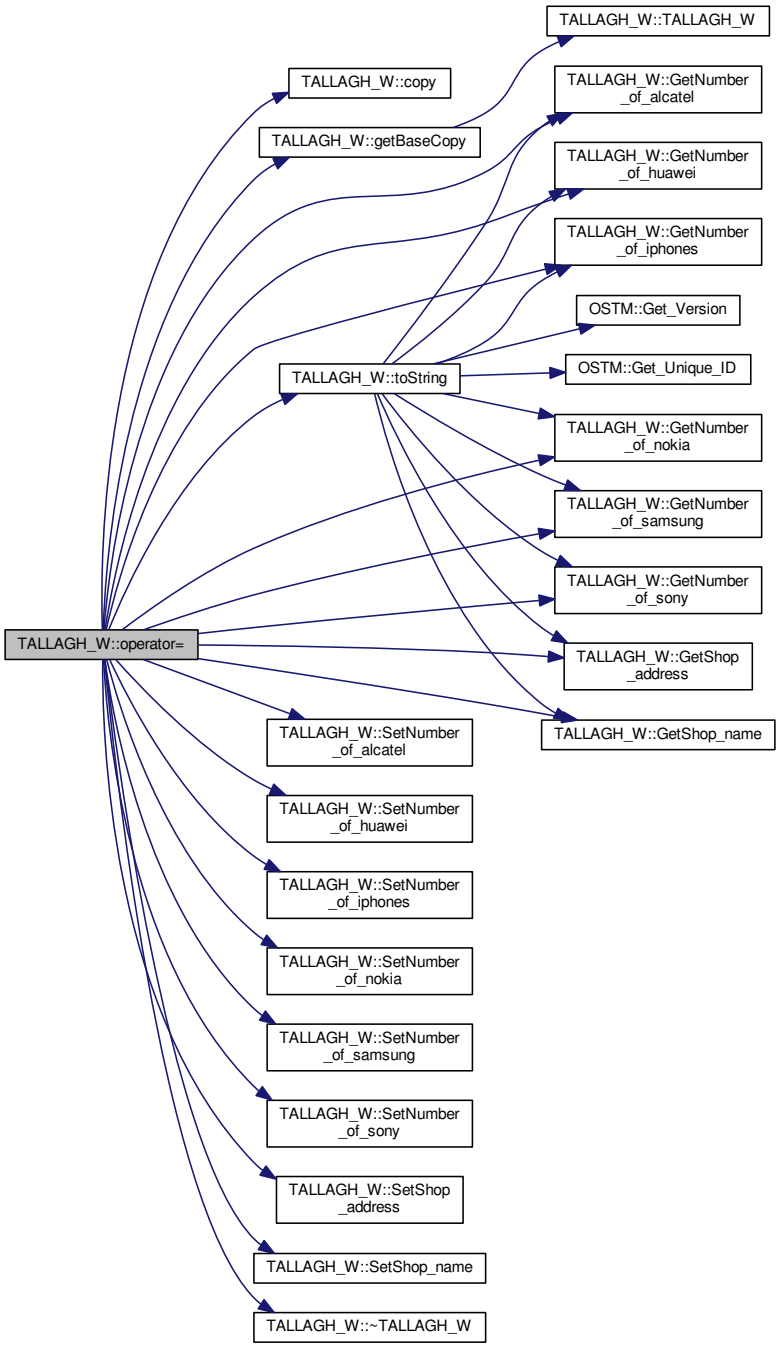
Operator

Definition at line 75 of file TALLAGH_W.h.

References _number_of_alcatel, _number_of_huawei, _number_of_iphones, _number_of_nokia, _number_of_samsung, _number_of_sony, _shop_address, _shop_name, copy(), getBaseCopy(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop_address(), GetShop_name(), SetNumber_of_alcatel(), SetNumber_of_huawei(), SetNumber_of_iphones(), SetNumber_of_nokia(), SetNumber_of_samsung(), SetNumber_of_sony(), SetShop_address(), SetShop_name(), toString(), and ~TALLAGH_W().

```
00075 {};
```

Here is the call graph for this function:



5.12.3.12 void TALLAGH_W::SetNumber_of_alcatel (int *_number_of_alcatel*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 67 of file TALLAGH_W.cpp.

References _number_of_alcatel.

Referenced by operator=().

```
00067                                                                 {
00068     this->_number_of_alcatel = _number_of_alcatel;
00069 }
```

5.12.3.13 void TALLAGH_W::SetNumber_of_huawei (int *_number_of_huawei*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 83 of file TALLAGH_W.cpp.

References _number_of_huawei.

Referenced by operator=().

```
00083                                                                 {
00084     this->_number_of_huawei = _number_of_huawei;
00085 }
```

5.12.3.14 void TALLAGH_W::SetNumber_of_iphones (int *_number_of_iphones*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 107 of file TALLAGH_W.cpp.

References _number_of_iphones.

Referenced by operator=().

```
00107                                                                 {
00108     this->_number_of_iphones = _number_of_iphones;
00109 }
```

5.12.3.15 void TALLAGH_W::SetNumber_of_nokia (int *_number_of_nokia*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 75 of file TALLAGH_W.cpp.

References _number_of_nokia.

Referenced by operator=().

```
00075                                                                 {
00076     this->_number_of_nokia = _number_of_nokia;
00077 }
```

5.12.3.16 void TALLAGH_W::SetNumber_of_samsung (int *_number_of_samsung*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 99 of file TALLAGH_W.cpp.

References _number_of_samsung.

Referenced by operator=().

```
00099                                                                 {
00100     this->_number_of_samsung = _number_of_samsung;
00101 }
```

5.12.3.17 void TALLAGH_W::SetNumber_of_sony (int *_number_of_sony*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 91 of file TALLAGH_W.cpp.

References _number_of_sony.

Referenced by operator=().

```
00091                                                   {
00092     this->_number_of_sony = _number_of_sony;
00093 }
```

5.12.3.18 void TALLAGH_W::SetShop_address (std::string *_shop_address*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 123 of file TALLAGH_W.cpp.

References _shop_address.

Referenced by operator=().

```
00123                                                    {
00124     this->_shop_address = _shop_address;
00125 }
```

5.12.3.19 void TALLAGH_W::SetShop_name (std::string *_shop_name*) [virtual]

Reimplemented from WAREHOUSE.

Definition at line 115 of file TALLAGH_W.cpp.

References _shop_name.

Referenced by operator=().

```
00115                                                 {
00116     this->_shop_name = _shop_name;
00117 }
```

5.12.3.20 void TALLAGH_W::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

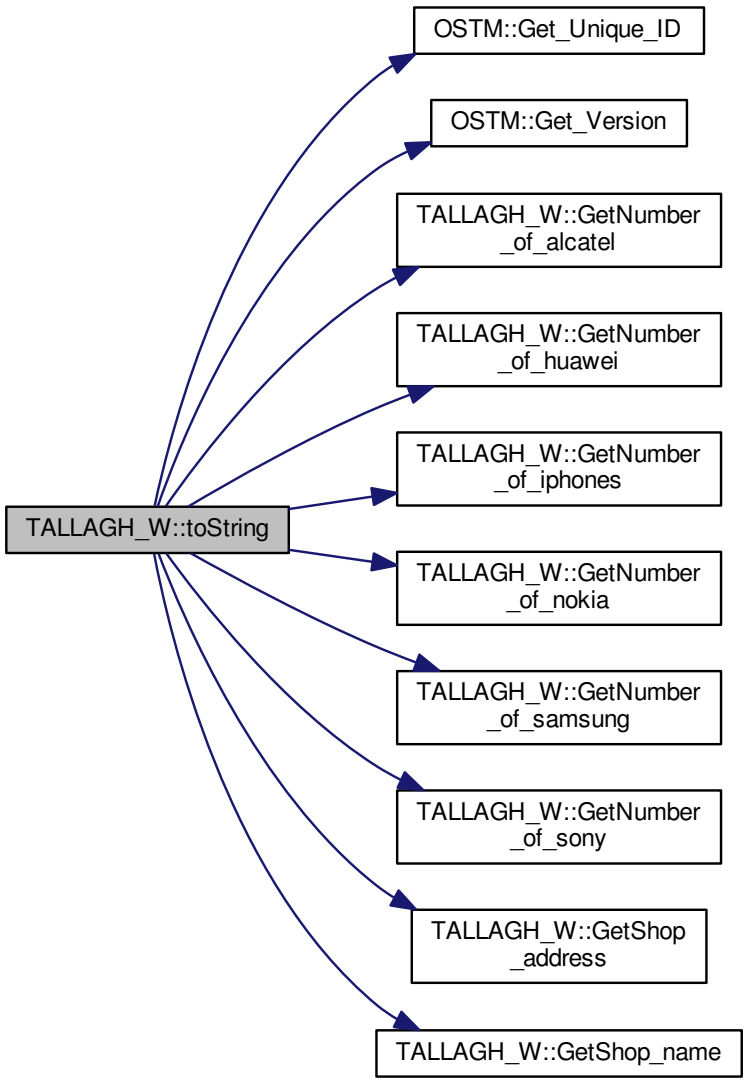
Definition at line 62 of file TALLAGH_W.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetNumber_of_alcatel(), GetNumber_of_huawei(), GetNumber_of_iphones(), GetNumber_of_nokia(), GetNumber_of_samsung(), GetNumber_of_sony(), GetShop↩_address(), and GetShop_name().

Referenced by operator=().

```
00063 {
00064     std::cout << "\n" << this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
```

Here is the call graph for this function:



5.12.4 Member Data Documentation

5.12.4.1 int TALLAGH_W::_number_of_alcatel [private]

Definition at line 117 of file TALLAGH_W.h.

Referenced by GetNumber_of_alcatel(), operator=(), SetNumber_of_alcatel(), and TALLAGH_W().

5.12.4.2 int TALLAGH_W::_number_of_huawei [private]

Definition at line 115 of file TALLAGH_W.h.

Referenced by GetNumber_of_huawei(), operator=(), SetNumber_of_huawei(), and TALLAGH_W().

5.12.4.3 int TALLAGH_W::_number_of_iphones [private]

Definition at line 112 of file TALLAGH_W.h.

Referenced by GetNumber_of_iphones(), operator=(), SetNumber_of_iphones(), and TALLAGH_W().

5.12.4.4 int TALLAGH_W::_number_of_nokia [private]

Definition at line 116 of file TALLAGH_W.h.

Referenced by GetNumber_of_nokia(), operator=(), SetNumber_of_nokia(), and TALLAGH_W().

5.12.4.5 int TALLAGH_W::_number_of_samsung [private]

Definition at line 113 of file TALLAGH_W.h.

Referenced by GetNumber_of_samsung(), operator=(), SetNumber_of_samsung(), and TALLAGH_W().

5.12.4.6 int TALLAGH_W::_number_of_sony [private]

Definition at line 114 of file TALLAGH_W.h.

Referenced by GetNumber_of_sony(), operator=(), SetNumber_of_sony(), and TALLAGH_W().

5.12.4.7 std::string TALLAGH_W::_shop_address [private]

Definition at line 110 of file TALLAGH_W.h.

Referenced by copy(), GetShop_address(), operator=(), SetShop_address(), and TALLAGH_W().

5.12.4.8 std::string TALLAGH_W::_shop_name [private]

Definition at line 111 of file TALLAGH_W.h.

Referenced by GetShop_name(), operator=(), SetShop_name(), and TALLAGH_W().

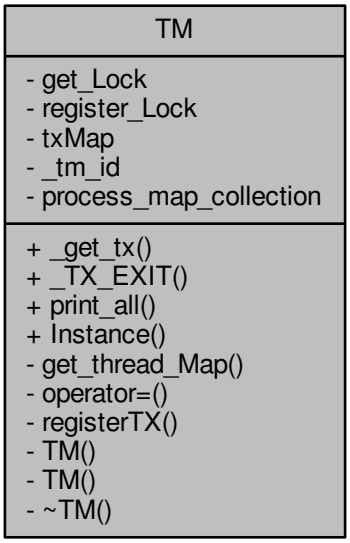
The documentation for this class was generated from the following files:

- TALLAGH_W.h
- TALLAGH_W.cpp

5.13 TM Class Reference

`#include <TM.h>`

Collaboration diagram for TM:



Public Member Functions

- std::shared_ptr< TX > const _get_tx ()

  _get_tx std::shared_ptr<TX>, returning a shared pointer with the transaction

- void _TX_EXIT ()

  _TX_EXIT void, the thread calls the ostm_exit function in the transaction, and clear all elements from the shared global collection associated with the main process

- void print_all ()

  ONLY FOR TESTING print_all void, print out all object key from txMAP collection.

Static Public Member Functions

- static TM & Instance ()

  Scott Meyer's Singleton creation, what is thread safe.

Private Member Functions

- std::map< std::thread::id, int > get_thread_Map ()

  get_thread_Map returning and map to insert to the process_map_collection as an inner value
- TM & operator= (const TM &)=delete

  TM copy operator, prevent from copying the Transaction Manager.
- void registerTX ()

  registerTX void, register transaction into txMap
- TM ()=default

  TM constructor, prevent from multiple instantiation.
- TM (const TM &)=delete

  TM copy constructor, prevent from copying the Transaction Manager.
- ~TM ()=default

  TM de-constructor, prevent from deletion.

Private Attributes

- std::mutex get_Lock
- std::mutex register_Lock
- std::map< std::thread::id, std::shared_ptr< TX > > txMap

Static Private Attributes

- static int _tm_id
- static std::map< int, std::map< std::thread::id, int > > process_map_collection

  STATIC GLOBAL MAP Collection to store all process associated keys to find when deleting transactions.

5.13.1 Detailed Description

Definition at line 80 of file TM.h.

5.13.2 Constructor & Destructor Documentation

5.13.2.1 TM::TM ( ) [private], [default]

TM constructor, prevent from multiple instantiation.

5.13.2.2 TM::~TM ( ) [private], [default]

TM de-constructor, prevent from deletion.

5.13.2.3 TM::TM (const TM &) [private], [delete]

TM copy constructor, prevent from copying the Transaction Manager.

5.13.3 Member Function Documentation

5.13.3.1 std::shared_ptr< TX > const TM::_get_tx ( )

_get_tx std::shared_ptr<TX>, returning a shared pointer with the transaction

_get_tx std::shared_ptr<TX>, return a shared_ptr with the Transaction object, if TX not exists then create one, else increasing the nesting level std::mutex, protect shared collection from critical section

Parameters

guard	std::lock_guard, locks the register_Lock mutex, unlock automatically when goes out of the scope

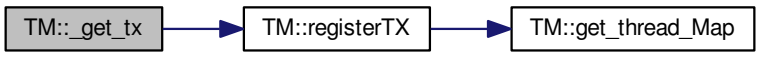
Definition at line 78 of file TM.cpp.

References get_Lock, registerTX(), and txMap.

Referenced by _complex_transfer_(), _complex_warehouse_transfer_(), _nested_warehouse_transfer_(), _nesting_(), _six_account_transfer_(), _two_account_transfer_(), _warehouse_transfer_(), and main().

```
00079 {
00080     std::lock_guard<std::mutex> guard(get_Lock);
00081
00082     std::map<std::thread::id, std::shared_ptr<TX>>::iterator it = txMap.find(std::this_thread::get_id(
      ));
00083     if(it == txMap.end())
00084     {
00085        registerTX();
00086        it = txMap.find(std::this_thread::get_id());
00087
00088     } else {
00089         it->second->_increase_tx_nesting();
00090     }
00091     //it = txMap.find(std::this_thread::get_id());
00092
00093
00094     return it->second;
00095
00096 }
```

Here is the call graph for this function:



5.13.3.2 void TM::_TX_EXIT ( )

_TX_EXIT void, the thread calls the ostm_exit function in the transaction, and clear all elements from the shared global collection associated with the main process

_TX_EXIT void, the thread calls the ostm_exit function in the transaction, and clear all elements from the shared global collection associated with the main process tx TX, local object to function in transaction

Definition at line 101 of file TM.cpp.

References TX::ostm_exit(), process_map_collection, and txMap.

Referenced by main().

```
00101                 {
00102     TX tx(std::this_thread::get_id());
00103     int ppid = getpid();
00104     std::map<int, std::map< std::thread::id, int >>::iterator process_map_collection_Iterator =
      TM::process_map_collection.find(ppid);
00105     if (process_map_collection_Iterator != TM::process_map_collection.end()) {
00106
00107         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00108             /*
00109              * Delete all transaction associated with the actual main process

00110              */
00111             txMap.erase(current->first);
00112         }
00113         TM::process_map_collection.erase(ppid);
00114
00115     }
00116     tx.ostm_exit();
00117 }
```

Here is the call graph for this function:

5.13.3.3 std::map< std::thread::id, int > TM::get_thread_Map ( ) [private]

get_thread_Map returning and map to insert to the process_map_collection as an inner value

get_thread_Map std::map, returning a map to store all unique ID from all objects from all transactions within the main process

Parameters

thread_Map	std::map< int, int >,

Definition at line 133 of file TM.cpp.

Referenced by registerTX().

```
00133                                           {
00134     std::map< std::thread::id, int > thread_Map;
00135     return thread_Map;
00136 }
```

5.13.3.4 TM & TM::Instance ( ) [static]

Scott Meyer's Singleton creation, what is thread safe.

Instance TM, return the same singleton object to any process.

Parameters

_instance	TM, static class reference to the instance of the Transaction Manager class
_instance	ppid, assigning the process id whoever created the Singleton instance

Definition at line 28 of file TM.cpp.

References _tm_id.

Referenced by main().

```
00028                   {
00029     static TM _instance;
00030     _instance._tm_id = getpid();
00031
00032     return _instance;
00033 }
```

5.13.3.5 TM& TM::operator= (const TM &) [private], [delete]

TM copy operator, prevent from copying the Transaction Manager.

5.13.3.6 void TM::print_all ( )

ONLY FOR TESTING print_all void, print out all object key from txMAP collection.

ONLY FOR TESTING print_all void, prints all object in the txMap

Definition at line 121 of file TM.cpp.

References get_Lock, and txMap.

Referenced by main().

```
00121                   {
00122     get_Lock.lock();
00123     for (auto current = txMap.begin(); current != txMap.end(); ++current) {
00124         std::cout << "KEY : " << current->first << std::endl;
00125     }
00126     get_Lock.unlock();
00127 }
```

5.13.3.7 void TM::registerTX ( ) [private]

registerTX void, register transaction into txMap

registerTX void, register a new TX Transaction object into ythe txMap/Transaction Map to manage all the transactions within the shared library

Parameters

txMap	std::map, collection to store all transaction created by the Transaction Manager
register_Lock	std::mutex, used by the lock_guard to protect shared map from race conditions
guard	std::lock_guard, locks the register_Lock mutex, unlock automatically when goes out of the scope

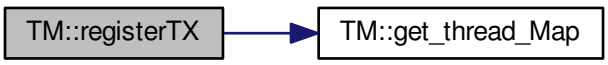
Definition at line 43 of file TM.cpp.

References get_thread_Map(), process_map_collection, register_Lock, and txMap.

Referenced by _get_tx().

```
00044 {
00045     std::lock_guard<std::mutex> guard(register_Lock);
00046     int ppid = getpid();
00047     std::map<int, std::map< std::thread::id, int >>::iterator process_map_collection_Iterator =
      TM::process_map_collection.find(ppid);
00048     if (process_map_collection_Iterator == TM::process_map_collection.end()) {
00049         /*
00050          * Register main process/application to the global map

00051          */
00052         std::map< std::thread::id, int >map = get_thread_Map();
00053         TM::process_map_collection.insert({ppid, map});
00054
00055     }
00056     std::map<std::thread::id, std::shared_ptr < TX>>::iterator it = txMap.find(
      std::this_thread::get_id());
00057     if (it == txMap.end()) {
00058         std::shared_ptr<TX> _transaction_object(new TX(std::this_thread::get_id()));
00059         txMap.insert({std::this_thread::get_id(), _transaction_object});
00060         /*
00061          * Get the map if registered first time

00062          */
00063         process_map_collection_Iterator = TM::process_map_collection.find(ppid);
00064         /*
00065          * Insert to the GLOBAL MAP as a helper to clean up at end of main process

00066          */
00067         process_map_collection_Iterator->second.insert({std::this_thread::get_id(), 1});
00068
00069     }
00070
00071 }
```

Here is the call graph for this function:



5.13.4 Member Data Documentation

5.13.4.1 int TM::_tm_id [static],[private]

Parameters

_tm↩ _id	pid_t, process id determine the actual process between process in the shared OSTM library

Definition at line 126 of file TM.h.

Referenced by Instance().

5.13.4.2 std::mutex TM::get_Lock [private]

Parameters

register_Lock	std::mutex, used in the _get_tx function

Definition at line 122 of file TM.h.

Referenced by _get_tx(), and print_all().

5.13.4.3 std::map< int, std::map< std::thread::id, int > > TM::process_map_collection [static], [private]

STATIC GLOBAL MAP Collection to store all process associated keys to find when deleting transactions.

Parameters

process_map_collection	std::map
static	Global std::map process_map_collection store all transactional objects/pointers

Definition at line 106 of file TM.h.

Referenced by _TX_EXIT(), and registerTX().

5.13.4.4 std::mutex TM::register_Lock [private]

Parameters

register_Lock	std::mutex, used in the registerTX function

Definition at line 118 of file TM.h.

Referenced by registerTX().

5.13.4.5 std::map<std::thread::id, std::shared_ptr<TX> > TM::txMap [private]

Parameters

txMap	std::map, store all transactional objects created with Transaction Manager

Definition at line 101 of file TM.h.

Referenced by _get_tx(), _TX_EXIT(), print_all(), and registerTX().

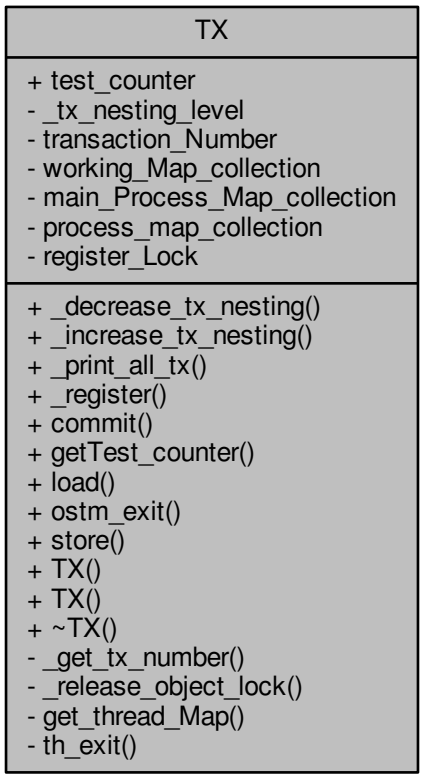
The documentation for this class was generated from the following files:

- TM.h
- TM.cpp

5.14 TX Class Reference

`#include <TX.h>`

Collaboration diagram for TX:



Public Member Functions

- void _decrease_tx_nesting ()

  Remove TX nesting level by one.
- void _increase_tx_nesting ()

  Add TX nesting level by one.
- void _print_all_tx ()
- void _register (std::shared_ptr< OSTM > object)

  Register OSTM pointer into STM library.
- bool commit ()

  Commit transactional changes.
- int getTest_counter ()

  getTest_counter TESTING ONLY!!! returning the value of the test_counter stored, number of rollbacks
- std::shared_ptr< OSTM > load (std::shared_ptr< OSTM > object)

  load std::shared_ptr<OSTM>, returning an std::shared_ptr<OSTM> copy of the original pointer, to work with during transaction life time

- void ostm_exit ()

  Delete all map entries associated with the main process.
- void store (std::shared_ptr< OSTM > object)

  Store transactional changes.
- TX (std::thread::id id)

  Constructor.
- TX (const TX &orig)

  Default copy constructor.
- ~TX ()

  De-constructor.

Static Public Attributes

- static int test_counter = 0

Private Member Functions

- const std::thread::id _get_tx_number () const

  _get_tx_number returning the transaction uniqe identifier
- void _release_object_lock ()

  _release_object_lock void, is get called from commit function, with the purpose to release the locks on all the objects participating in the transaction
- std::map< int, int > get_thread_Map ()

  get_thread_Map returning and map to insert to the process_map_collection as an inner value
- void th_exit ()

  Clean up all associated values by the thread delete from working_Map_collection, it is an automated function.

Private Attributes

- int _tx_nesting_level
- std::thread::id transaction_Number

  Returning the transaction number.
- std::map< int, std::shared_ptr< OSTM > > working_Map_collection

  MAP Collection to store OSTM parent based pointers to make invisible changes during isolated transaction.*

Static Private Attributes

- static std::map< int, std::shared_ptr< OSTM > > main_Process_Map_collection

  STATIC GLOBAL MAP Collection to store OSTM parent based pointers to control/lock and compare objects version number within transactions.*
- static std::map< int, std::map< int, int > > process_map_collection

  STATIC GLOBAL MAP Collection to store all process associated keys to find when deleting transactions.
- static std::mutex register_Lock

Friends

- class TM

5.14.1 Detailed Description

Definition at line 26 of file TX.h.

5.14.2 Constructor & Destructor Documentation

5.14.2.1 TX::TX (std::thread::id *id*)

Constructor.

Parameters

transaction_Number	int, to store associated thread
_tx_nesting_level	int, to store and indicate nesting level of transactions within transaction

Definition at line 31 of file TX.cpp.

References _tx_nesting_level, and transaction_Number.

```
00031                       {
00032     this->transaction_Number = id;
00033     this->_tx_nesting_level = 0;
00034 }
```

5.14.2.2 TX::~TX ( )

De-constructor.

Definition at line 38 of file TX.cpp.

```
00038         {
00039
00040 }
```

5.14.2.3 TX::TX (const TX & *orig*)

Default copy constructor.

Definition at line 44 of file TX.cpp.

```
00044                       {
00045
00046 }
```

5.14.3 Member Function Documentation

5.14.3.1 void TX::_decrease_tx_nesting ( )

Remove TX nesting level by one.

_decrease_tx_nesting decrease the value stored in _tx_nesting_level by one, when outer transactions commiting

Parameters

_tx_nesting_level	int

Definition at line 316 of file TX.cpp.

References _tx_nesting_level.

Referenced by commit().

```
00316                                {
00317     // std::cout << "[this->_tx_nesting_level] = " << this->_tx_nesting_level << std::endl;
00318      this->_tx_nesting_level -= 1;
00319 ;
00320 }
```

5.14.3.2 const std::thread::id TX::_get_tx_number ( ) const [private]

_get_tx_number returning the transaction uniqe identifier

_get_tx_number std::thread::id, returning the thread id that has assigned the given transaction

Parameters

transaction_Number	int

Definition at line 331 of file TX.cpp.

References transaction_Number.

```
00331                                              {
00332     return transaction_Number;
00333 }
```

5.14.3.3 void TX::_increase_tx_nesting ( )

Add TX nesting level by one.

_increase_tx_nesting increase the value stored in _tx_nesting_level by one, indicate that the transaction nested

Parameters

_tx_nesting_level	int

Definition at line 307 of file TX.cpp.

References _tx_nesting_level.

```
00307                                {
00308
00309     this->_tx_nesting_level += 1;
00310     // std::cout << "[this->_tx_nesting_level] = " << this->_tx_nesting_level << std::endl;
00311 }
```

5.14.3.4 void TX::_print_all_tx ( )

ONLY FOR TESTING CHECK THE MAP AFTER THREAD EXIT AND ALL SHOULD BE DELETED!!!!!!!

Definition at line 346 of file TX.cpp.

References process_map_collection, and working_Map_collection.

```
00346                         {
00347
00348     std::cout << "[PRINTALLTHREAD]" << std::endl;
00349     std::map< int, std::shared_ptr<OSTM> >::iterator it;
00350     /*
00351      * All registered thread id in the TX global

00352      */
00353     int ppid = getpid();
00354     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00355     if (process_map_collection_Iterator != TX::process_map_collection.end()) {
00356
00357         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00358             it = working_Map_collection.find(current->first);
00359             if(it != working_Map_collection.end()){
00360                 std::cout << "[Unique number ] : " <<it->second->Get_Unique_ID() << std::endl;
00361             }
00362
00363
00364         }
00365
00366     }
00367 }
```

5.14.3.5 void TX::_register (std::shared_ptr< OSTM > *object*)

Register OSTM pointer into STM library.

register void, receives an std::shared_ptr<OSTM> that point to the original memory space to protect from reca conditions

Parameters

working_Map_collection	std::map, store all the std::shared_ptr<OSTM> pointer in the transaction
main_Process_Map_collection	std::map, store all std::shared_ptr<OSTM> from all transaction, used to lock and compare the objects
process_map_collection	std::map, store all std::shared_ptr<OSTM> unique ID from all transaction, used to delete all pointers used by the main process, from all transaction before the program exit.
std::lock_guard	use register_Lock(mutex) shared lock between all transaction
ppid	int, store main process number

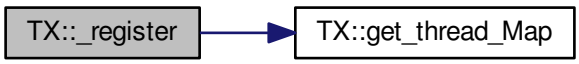
Definition at line 104 of file TX.cpp.

References get_thread_Map(), main_Process_Map_collection, process_map_collection, register_Lock, and working_Map_collection.

```
00104                                         {
00105     /*
00106      * MUST USE SHARED LOCK TO PROTECT SHARED GLOBAL MAP/COLLECTION

00107      */
00108     std::lock_guard<std::mutex> guard(TX::register_Lock);
```

```
00109
00110     /*
00111      * Check for null pointer !

00112      * Null pointer can cause segmentation fault!!!

00113      */
00114     if(object == nullptr){
00115         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN REGISTER FUNCTION]") );
00116     }
00117
00118     int ppid = getpid();
00119     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00120     if (process_map_collection_Iterator == TX::process_map_collection.end()) {
00121         /*
00122          * Register main process/application to the global map

00123          */
00124         std::map< int, int >map =  get_thread_Map();
00125         TX::process_map_collection.insert({ppid, map});
00126         /*
00127          * Get the map if registered first time

00128          */
00129         process_map_collection_Iterator = TX::process_map_collection.find(ppid);
00130     }
00131     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(object->Get_Unique_ID());
00132     if (main_Process_Map_collection_Iterator == TX::main_Process_Map_collection
      .end()) {
00133         /*
00134          * Insert to the GLOBAL MAP

00135          */
00136         TX::main_Process_Map_collection.insert({object->Get_Unique_ID(),
      object});
00137         /*
00138          * Insert to the GLOBAL MAP as a helper to clean up at end of main process

00139          */
00140         process_map_collection_Iterator->second.insert({object->Get_Unique_ID(), 1});
00141     }
00142
00143
00144     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator
      = working_Map_collection.find(object->Get_Unique_ID());
00145     if (working_Map_collection_Object_Shared_Pointer_Iterator ==
      working_Map_collection.end()) {
00146
00147         working_Map_collection.insert({object->Get_Unique_ID(), object->getBaseCopy(
      object)});
00148     }
00149
00150 }
```

Here is the call graph for this function:



5.14.3.6 void TX::_release_object_lock ( ) [private]

_release_object_lock void, is get called from commit function, with the purpose to release the locks on all the objects participating in the transaction

Release the locks in objects with transaction associated collection

Parameters

working_Map_collection	std::map, store all the std::shared_ptr<OSTM> pointer in the transaction
main_Process_Map_collection	std::map, store all std::shared_ptr<OSTM> from all transaction, used to release the lock on object

Definition at line 286 of file TX.cpp.

References main_Process_Map_collection, and working_Map_collection.

Referenced by commit().

```
00286                                {
00287
00288     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00289     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00290     for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00291
00292             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find((
      working_Map_collection_Object_Shared_Pointer_Iterator->second)->Get_Unique_ID());
00293             if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()) {
00294                 /*
00295                  * Release object lock

00296                  */
00297                 (main_Process_Map_collection_Iterator)->second->unlock_Mutex();
00298
00299             }
00300         }
00301 }
```

5.14.3.7 bool TX::commit ( )

Commit transactional changes.

commit bool, returns boolean value TRUE/FALSE depends on the action taken within the function

Parameters

working_Map_collection	std::map, store all the std::shared_ptr<OSTM> pointer in the transaction
main_Process_Map_collection	std::map, store all std::shared_ptr<OSTM> from all transaction, used to lock and compare the objects
can_Commit	bool, helps to make decision that the transaction can commit or rollback

Definition at line 202 of file TX.cpp.

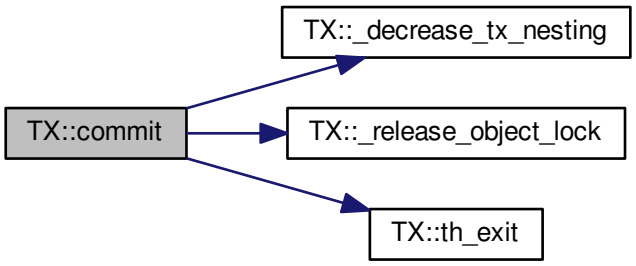
References _decrease_tx_nesting(), _release_object_lock(), _tx_nesting_level, main_Process_Map_collection, test_counter, th_exit(), and working_Map_collection.

```
00202                {
00203
00204     bool can_Commit = true;
00205
00206     /*
00207      * Dealing with nested transactions first

00208      */
```

```
00209     if (this->_tx_nesting_level > 0) {
00210         _decrease_tx_nesting();
00211         return true;
00212     }
00213 
00214     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00215 
00216     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00217     for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00218 
00219             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Unique_ID());
00220             /*
00221              * Throws runtime error if object can not find

00222              */
00223             if(main_Process_Map_collection_Iterator ==
      TX::main_Process_Map_collection.end())
00224             {
00225                 throw std::runtime_error(std::string("[RUNTIME ERROR : CAN'T FIND OBJECT COMMIT FUNCTION]")
      );
00226             }
00227 
00228         /*
00229          * Busy wait WHILE object locked by other thread

00230          */
00231         while(!(main_Process_Map_collection_Iterator->second)->is_Locked());
00232 
00233         if (main_Process_Map_collection_Iterator->second->Get_Version() >
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Version()) {
00234 
00235             working_Map_collection_Object_Shared_Pointer_Iterator->second->Set_Can_Commit(false);
00236             can_Commit = false;
00237             break;
00238         } else {
00239 
00240             working_Map_collection_Object_Shared_Pointer_Iterator->second->Set_Can_Commit(true);
00241         }
00242     }
00243     if (!can_Commit) {
00244         TX::test_counter += 1;
00245         for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00246 
00247             main_Process_Map_collection_Iterator  =
      TX::main_Process_Map_collection.find(
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Unique_ID());
00248             (working_Map_collection_Object_Shared_Pointer_Iterator->second)->copy(
      working_Map_collection_Object_Shared_Pointer_Iterator->second, main_Process_Map_collection_Iterator->second);
00249 
00250         }
00251 
00252         _release_object_lock();
00253 
00254         return false;
00255     } else {
00256         /*
00257          * Commit changes

00258          */
00259         for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00260 
00261                 main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find((
      working_Map_collection_Object_Shared_Pointer_Iterator->second)->Get_Unique_ID());
00262                 if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()) {
00263 
00264                     (main_Process_Map_collection_Iterator->second)->copy(
      main_Process_Map_collection_Iterator->second, working_Map_collection_Object_Shared_Pointer_Iterator->second);
00265                     main_Process_Map_collection_Iterator->second->increase_VersionNumber();
00266 
00267 
00268                 } else {
00269                     throw std::runtime_error(std::string("[RUNTIME ERROR : CAN'T FIND OBJECT COMMIT
       FUNCTION]"));
00270 
```

```
00271                 }
00272         }
00273
00274
00275         _release_object_lock();
00276         this->th_exit();
00277         return true;
00278     }
00279 }//Commit finish
```

Here is the call graph for this function:



5.14.3.8 std::map< int, int > TX::get_thread_Map ( ) [private]

get_thread_Map returning and map to insert to the process_map_collection as an inner value

get_thread_Map std::map, returning a map to store all unique ID from all objects from all transactions within the main process

Parameters

thread_Map	std::map< int, int >,

Definition at line 338 of file TX.cpp.

Referenced by _register().

```
00338                                     {
00339     std::map< int, int > thread_Map;
00340     return thread_Map;
00341 }
```

5.14.3.9 int TX::getTest_counter ( )

getTest_counter TESTING ONLY!!! returning the value of the test_counter stored, number of rollbacks

Definition at line 324 of file TX.cpp.

References test_counter.

```
00324                         {
00325     return TX::test_counter;
00326 }
```

5.14.3.10 std::shared_ptr< OSTM > TX::load (std::shared_ptr< OSTM > *object*)

load std::shared_ptr<OSTM>, returning an std::shared_ptr<OSTM> copy of the original pointer, to work with during transaction life time

Register OSTM pointer into STM library

Parameters

working_Map_collection	std::map, store all the std::shared_ptr<OSTM> pointer in the transaction

Definition at line 155 of file TX.cpp.

References working_Map_collection.

```
00155                                                          {
00156
00157     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00158     /*
00159      * Check for null pointer !

00160      * Null pointer can cause segmentation fault!!!

00161      */
00162     if(object == nullptr){
00163         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN LOAD FUNCTION]") );
00164     }
00165
00166         working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.find(object->Get_Unique_ID());
00167
00168     if (working_Map_collection_Object_Shared_Pointer_Iterator !=
      working_Map_collection.end()) {
00169
00170         return working_Map_collection_Object_Shared_Pointer_Iterator->second->getBaseCopy(
      working_Map_collection_Object_Shared_Pointer_Iterator->second);
00171
00172     } else { throw std::runtime_error(std::string("[RUNTIME ERROR : NO OBJECT FOUND LOAD FUNCTION]") );}
00173 }
```

5.14.3.11 void TX::ostm_exit ( )

Delete all map entries associated with the main process.

ostm_exit void, clear all elements from the shared global collections associated with the main process

Parameters

main_Process_Map_collection	std::map, store all std::shared_ptr<OSTM> from all transaction shared between multiple processes
process_map_collection	std::map, store all unique id from all transaction within main process DO NOT CALL THIS METHOD EXPLICITLY!!!!!! WILL DELETE ALL PROCESS ASSOCIATED ELEMENTS!!!!

Definition at line 72 of file TX.cpp.

References main_Process_Map_collection, and process_map_collection.

Referenced by TM::_TX_EXIT().

```
00072                   {
00073     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00074
00075     int ppid = getpid();
00076     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00077     if (process_map_collection_Iterator != TX::process_map_collection.end()) {
00078
00079         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00080             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(current->first);
00081
00082             if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()){
00083                 /*
00084                  * Delete element from shared main_Process_Map_collection by object unique key value,
       shared_ptr will destroy automatically

00085                  */
00086                 TX::main_Process_Map_collection.erase(
      main_Process_Map_collection_Iterator->first);
00087             }
00088         }
00089         /*
00090          * Delete from Process_map_collection, Main process exits delete association with library

00091          */
00092         TX::process_map_collection.erase(process_map_collection_Iterator->first);
00093     }
00094 }
```

5.14.3.12 void TX::store (std::shared_ptr< OSTM > *object*)

Store transactional changes.

store void, receive an std::shared_ptr<OSTM> object to store the changes within the transaction, depends the user action

Parameters

working_Map_collection	std::map, store all the std::shared_ptr<OSTM> pointer in the transaction

Definition at line 178 of file TX.cpp.

References working_Map_collection.

```
00178                                       {
00179     /*
00180      * Check for null pointer !

00181      * Null pointer can cause segmentation fault!!!

00182      */
00183     if(object == nullptr){
00184         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN STORE FUNCTION]") );
00185     }
00186
00187     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00188
00189     working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.find(object->Get_Unique_ID());
00190     if (working_Map_collection_Object_Shared_Pointer_Iterator !=
      working_Map_collection.end()) {
00191
00192         working_Map_collection_Object_Shared_Pointer_Iterator->second = object;
00193
00194     } else { std::cout << "[ERROR STORE]" << std::endl; }
00195 }
```

5.14.3.13 void TX::th_exit ( ) [private]

Clean up all associated values by the thread delete from working_Map_collection, it is an automated function.

th_exit void, delete all std::shared_ptr<OSTM> elements from working_Map_collection, that store pointers to working objects

Parameters

working_Map_collection	std::map, store std::shared_ptr<OSTM> transaction pointers

Definition at line 52 of file TX.cpp.

References _tx_nesting_level, and working_Map_collection.

Referenced by commit().

```
00052                 {
00053
00054     if (this->_tx_nesting_level > 0) {
00055         /*
00056          * Active nested transactions running in background, do not delete anything yet
00057          */
00058     } else {
00059         /*
00060          * Remove all elements map entries from transaction and clear the map
00061          */
00062         working_Map_collection.clear();
00063     }
00064 }
```

5.14.4 Friends And Related Function Documentation

5.14.4.1 friend class TM [friend]

Only TM Transaction Manager can create instance of TX Transaction

Definition at line 72 of file TX.h.

5.14.5 Member Data Documentation

5.14.5.1 int TX::_tx_nesting_level [private]

Parameters

_tx_nesting_level	int

Definition at line 102 of file TX.h.

Referenced by _decrease_tx_nesting(), _increase_tx_nesting(), commit(), th_exit(), and TX().

5.14.5.2 std::map< int, std::shared_ptr< OSTM > > TX::main_Process_Map_collection [static], [private]

STATIC GLOBAL MAP Collection to store OSTM* parent based pointers to control/lock and compare objects version number within transactions.

Parameters

main_Process_Map_collection	std::map
static	Global std::map main_Process_Map_collection store all transactional objects/pointers

Definition at line 108 of file TX.h.

Referenced by _register(), _release_object_lock(), commit(), and ostm_exit().

5.14.5.3 std::map< int, std::map< int, int > > TX::process_map_collection [static], [private]

STATIC GLOBAL MAP Collection to store all process associated keys to find when deleting transactions.

Parameters

process_map_collection	std::map
static	Global std::map process_map_collection store all transactional objects/pointers

Definition at line 113 of file TX.h.

Referenced by _print_all_tx(), _register(), and ostm_exit().

5.14.5.4 std::mutex TX::register_Lock [static], [private]

Parameters

register_Lock	std::mutex to control shared access on MAIN MAP
static	shared std:mutex register_Lock to protect writes into shared global collection

Definition at line 122 of file TX.h.

Referenced by _register().

5.14.5.5 int TX::test_counter = 0 [static]

Parameters

test_counter	int ONLY FOR TESTING!!!
static	Global counter for rollback

Definition at line 80 of file TX.h.

Referenced by commit(), and getTest_counter().

5.14.5.6 std::thread::id TX::transaction_Number [private]

Returning the transaction number.

Parameters

transaction_Number	std::thread::id NOT USED YET

Definition at line 98 of file TX.h.

Referenced by _get_tx_number(), and TX().

5.14.5.7 std::map< int, std::shared_ptr<OSTM> > TX::working_Map_collection [private]

MAP Collection to store OSTM* parent based pointers to make invisible changes during isolated transaction.

Parameters

working_Map_collection	std::map

Definition at line 92 of file TX.h.

Referenced by _print_all_tx(), _register(), _release_object_lock(), commit(), load(), store(), and th_exit().

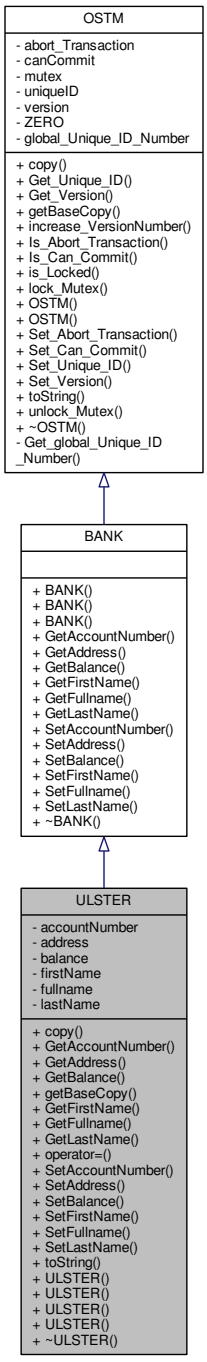
The documentation for this class was generated from the following files:

- TX.h
- TX.cpp

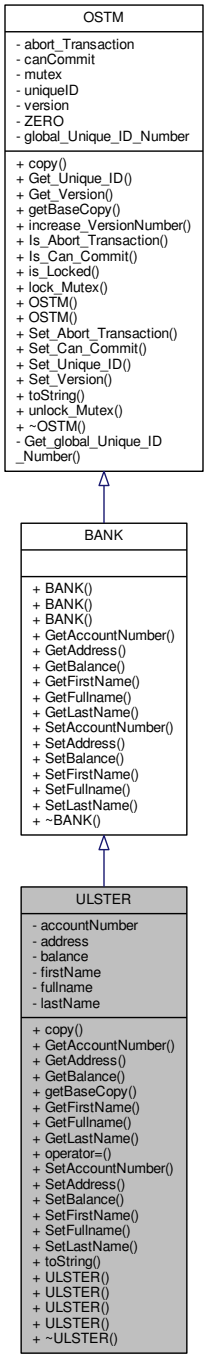
5.15 ULSTER Class Reference

```
#include <ULSTER.h>
```

Inheritance diagram for ULSTER:



Collaboration diagram for ULSTER:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const

- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- ULSTER operator= (const ULSTER &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- ULSTER ()
- ULSTER (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- ULSTER (std::shared_ptr< BANK > obj, int _version, int _unique_id)
- ULSTER (const ULSTER &orig)
- virtual ~ULSTER ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.15.1 Detailed Description

Inherit from BANK

Definition at line 19 of file ULSTER.h.

5.15.2 Constructor & Destructor Documentation

5.15.2.1 ULSTER::ULSTER ( ) [inline]

Constructor

Definition at line 24 of file ULSTER.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by getBaseCopy(), and ULSTER().

```
00024             : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
```

5.15.2.2 ULSTER::ULSTER (int *accountNumber*, double *balance*, std::string *firstName*, std::string *lastName*, std::string *address*) [inline]

Custom constructor

Definition at line 35 of file ULSTER.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00035                                                                                                    :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
```

5.15.2.3 ULSTER::ULSTER (std::shared_ptr< BANK > *obj*, int *_version*, int *_unique_id*) [inline]

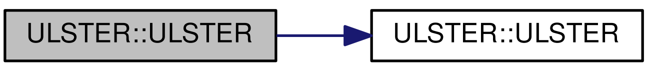
Custom constructor, used by the library for deep copying

Definition at line 46 of file ULSTER.h.

References accountNumber, address, balance, firstName, fullname, lastName, and ULSTER().

```
00046                                                              : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
```

Here is the call graph for this function:



5.15.2.4 ULSTER::ULSTER (const ULSTER & *orig*)

Copy constructor

Definition at line 15 of file ULSTER.cpp.

```
00015                              {
00016 }
```

5.15.2.5 ULSTER::~ULSTER ( ) [virtual]

de-constructor

Definition at line 18 of file ULSTER.cpp.

Referenced by operator=().

```
00018                 {
00019 }
```

5.15.3 Member Function Documentation

5.15.3.1 void ULSTER::copy (std::shared_ptr< OSTM > *to,* std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>
objFROM	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

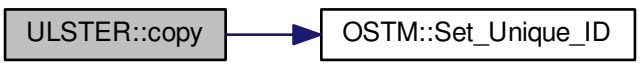
Definition at line 37 of file ULSTER.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00037                                                                   {
00038
00039     std::shared_ptr<ULSTER> objTO = std::dynamic_pointer_cast<ULSTER>(to);
00040     std::shared_ptr<ULSTER> objFROM = std::dynamic_pointer_cast<ULSTER>(from);
00041     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00042     objTO->Set_Version(objFROM->Get_Version());
00043     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00044     objTO->SetBalance(objFROM->GetBalance());
00045
00046
00047 }
```

Here is the call graph for this function:



5.15.3.2 int ULSTER::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 83 of file ULSTER.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00083                                   {
00084     return accountNumber;
00085 }
```

5.15.3.3 std::string ULSTER::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 67 of file ULSTER.cpp.

References address.

Referenced by operator=().

```
00067                                   {
00068     return address;
00069 }
```

5.15.3.4 double ULSTER::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 75 of file ULSTER.cpp.

References balance.

Referenced by operator=(), and toString().

```
00075                                  {
00076     return balance;
00077 }
```

5.15.3.5 std::shared_ptr< OSTM > ULSTER::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a std::shared_ptr<BANK> return type

Reimplemented from OSTM.

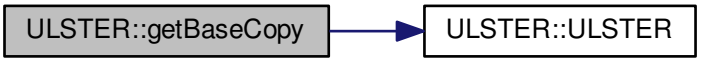
Definition at line 25 of file ULSTER.cpp.

References ULSTER().

Referenced by operator=().

```
00026 {
00027     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00028     std::shared_ptr<BANK> obj(new ULSTER(objTO,object->Get_Version(),object->Get_Unique_ID()));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00030     return ostm_obj;
00031 }
```

Here is the call graph for this function:



5.15.3.6 std::string ULSTER::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 99 of file ULSTER.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00099                                   {
00100     return firstName;
00101 }
```

5.15.3.7 std::string ULSTER::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 107 of file ULSTER.cpp.

References fullname.

Referenced by operator=().

```
00107                                   {
00108     return fullname;
00109 }
```

5.15.3.8 std::string ULSTER::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 91 of file ULSTER.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00091                                   {
00092     return lastName;
00093 }
```

5.15.3.9 ULSTER ULSTER::operator= (const ULSTER & *orig*) [inline]

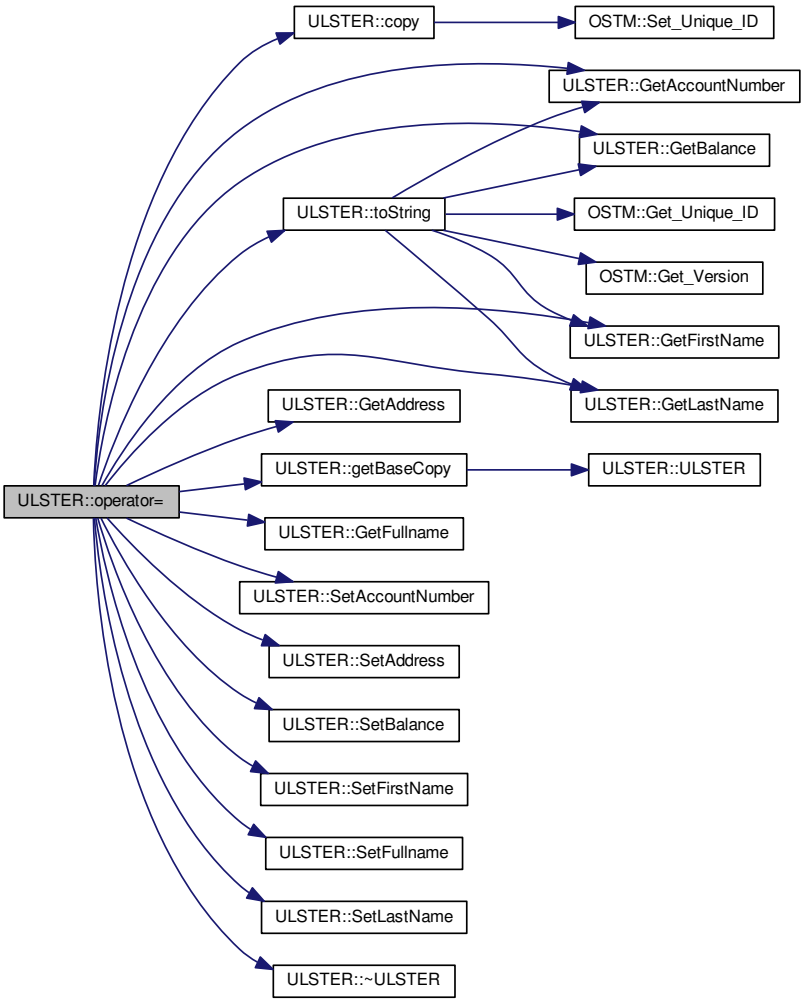
Operator

Definition at line 62 of file ULSTER.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~ULSTER().

```
00062 {};
```

Here is the call graph for this function:



5.15.3.10 void ULSTER::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 79 of file ULSTER.cpp.

References accountNumber.

Referenced by operator=().

```
00079                                                {
00080     this->accountNumber = accountNumber;
00081 }
```

5.15.3.11 void ULSTER::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 63 of file ULSTER.cpp.

References address.

Referenced by operator=().

```
00063                                            {
00064     this->address = address;
00065 }
```

5.15.3.12 void ULSTER::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 71 of file ULSTER.cpp.

References balance.

Referenced by operator=().

```
00071                                          {
00072     this->balance = balance;
00073 }
```

5.15.3.13 void ULSTER::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 95 of file ULSTER.cpp.

References firstName.

Referenced by operator=().

```
00095                                             {
00096     this->firstName = firstName;
00097 }
```

5.15.3.14 void ULSTER::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 103 of file ULSTER.cpp.

References fullname.

Referenced by operator=().

```
00103                                           {
00104     this->fullname = fullname;
00105 }
```

5.15.3.15 void ULSTER::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 87 of file ULSTER.cpp.

References lastName.

Referenced by operator=().

```
00087                                           {
00088     this->lastName = lastName;
00089 }
```

5.15.3.16 void ULSTER::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

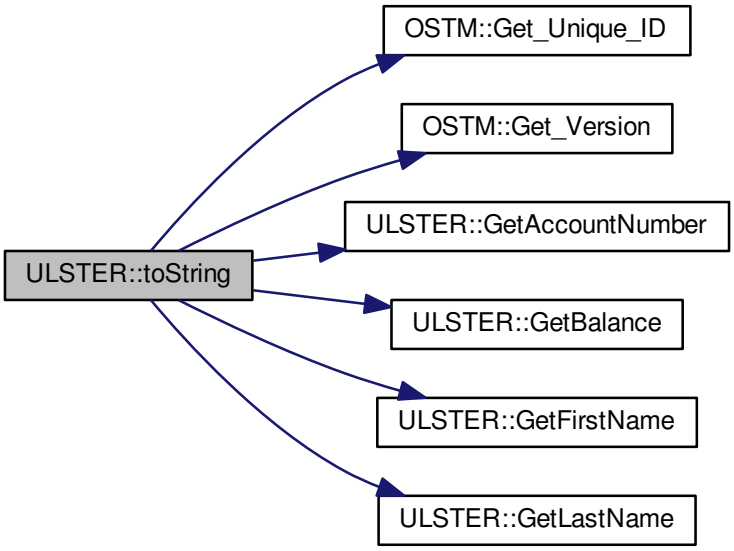
Definition at line 58 of file ULSTER.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00059 {
00060     std::cout << "\nULSTER BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account
      : " << this->GetAccountNumber() << "\nDouble value : " << this->
     GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
     this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00061 }
```

Here is the call graph for this function:



5.15.4 Member Data Documentation

5.15.4.1 int ULSTER::accountNumber [private]

Definition at line 95 of file ULSTER.h.

Referenced by GetAccountNumber(), operator=(), SetAccountNumber(), and ULSTER().

5.15.4.2 std::string ULSTER::address [private]

Definition at line 97 of file ULSTER.h.

Referenced by GetAddress(), operator=(), SetAddress(), and ULSTER().

5.15.4.3 double ULSTER::balance [private]

Definition at line 96 of file ULSTER.h.

Referenced by GetBalance(), operator=(), SetBalance(), and ULSTER().

5.15.4.4 std::string ULSTER::firstName [private]

Definition at line 93 of file ULSTER.h.

Referenced by GetFirstName(), operator=(), SetFirstName(), and ULSTER().

5.15.4.5 std::string ULSTER::fullname [private]

Definition at line 92 of file ULSTER.h.

Referenced by GetFullname(), operator=(), SetFullname(), and ULSTER().

5.15.4.6 std::string ULSTER::lastName [private]

Definition at line 94 of file ULSTER.h.

Referenced by GetLastName(), operator=(), SetLastName(), and ULSTER().

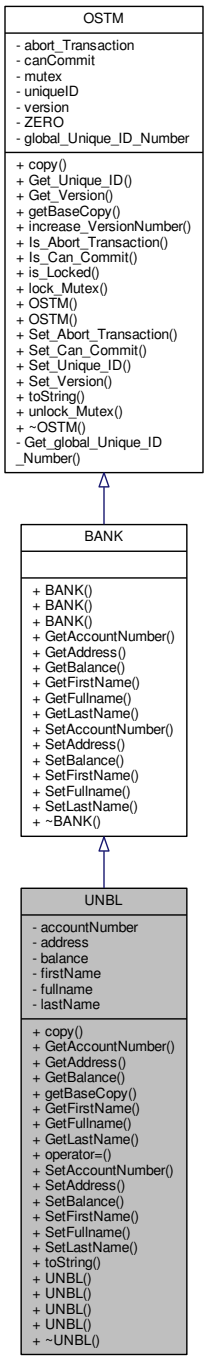
The documentation for this class was generated from the following files:

- ULSTER.h
- ULSTER.cpp

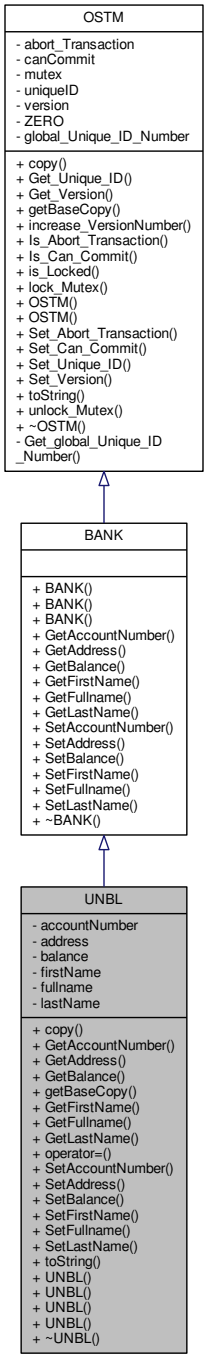
5.16 UNBL Class Reference

```
#include <UNBL.h>
```

Inheritance diagram for UNBL:



Collaboration diagram for UNBL:



Public Member Functions

- virtual void copy (std::shared_ptr< OSTM > to, std::shared_ptr< OSTM > from)

  copy function, make deep copy of the object/pointer
- virtual int GetAccountNumber () const
- virtual std::string GetAddress () const
- virtual double GetBalance () const

- virtual std::shared_ptr< OSTM > getBaseCopy (std::shared_ptr< OSTM > object)

  getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object
- virtual std::string GetFirstName () const
- virtual std::string GetFullname () const
- virtual std::string GetLastName () const
- UNBL operator= (const UNBL &orig)
- virtual void SetAccountNumber (int accountNumber)
- virtual void SetAddress (std::string address)
- virtual void SetBalance (double balance)
- virtual void SetFirstName (std::string firstName)
- virtual void SetFullname (std::string fullname)
- virtual void SetLastName (std::string lastName)
- virtual void toString ()

  _cast, is use to cast bak the std::shared_ptr<OSTM> to the required type
- UNBL ()
- UNBL (int accountNumber, double balance, std::string firstName, std::string lastName, std::string address)
- UNBL (std::shared_ptr< BANK > obj, int _version, int _unique_id)
- UNBL (const UNBL &orig)
- virtual ~UNBL ()

Private Attributes

- int accountNumber
- std::string address
- double balance
- std::string firstName
- std::string fullname
- std::string lastName

5.16.1 Detailed Description

Inherit from BANK

Definition at line 19 of file UNBL.h.

5.16.2 Constructor & Destructor Documentation

5.16.2.1 UNBL::UNBL ( ) [inline]

Constructor

Definition at line 24 of file UNBL.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

Referenced by getBaseCopy(), and UNBL().

```
00024           : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
```

5.16.2.2 UNBL::UNBL (int *accountNumber,* double *balance,* std::string *firstName,* std::string *lastName,* std::string *address*) [inline]

Custom constructor

Definition at line 35 of file UNBL.h.

References accountNumber, address, balance, firstName, fullname, and lastName.

```
00035                                                                                                               :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
```

5.16.2.3 UNBL::UNBL (std::shared_ptr< BANK > *obj,* int *_version,* int *_unique_id*) [inline]

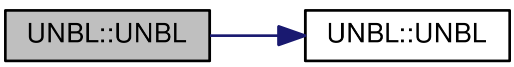
Custom constructor, used by the library for deep copying

Definition at line 46 of file UNBL.h.

References accountNumber, address, balance, firstName, fullname, lastName, and UNBL().

```
00046                                                                 : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
```

Here is the call graph for this function:



5.16.2.4 UNBL::UNBL (const UNBL & *orig*)

Copy constructor

Definition at line 11 of file UNBL.cpp.

```
00011                            {
00012 }
```

5.16.2.5 UNBL::~UNBL ( ) [virtual]

de-constructor

Definition at line 14 of file UNBL.cpp.

Referenced by operator=().

```
00014             {
00015 }
```

5.16.3 Member Function Documentation

5.16.3.1 void UNBL::copy (std::shared_ptr< OSTM > *to*, std::shared_ptr< OSTM > *from*) [virtual]

copy function, make deep copy of the object/pointer

Parameters

objTO	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>
objFROM	is a std::shared_ptr<BANK> type object casted back from std::shared_ptr<OSTM>

Reimplemented from OSTM.

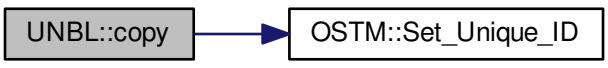
Definition at line 33 of file UNBL.cpp.

References OSTM::Set_Unique_ID().

Referenced by operator=().

```
00033                                                                {
00034
00035     std::shared_ptr<UNBL> objTO = std::dynamic_pointer_cast<UNBL>(to);
00036     std::shared_ptr<UNBL> objFROM = std::dynamic_pointer_cast<UNBL>(from);
00037     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00038     objTO->Set_Version(objFROM->Get_Version());
00039     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00040     objTO->SetBalance(objFROM->GetBalance());
00041
00042 }
```

Here is the call graph for this function:



5.16.3.2 int UNBL::GetAccountNumber ( ) const [virtual]

Reimplemented from BANK.

Definition at line 78 of file UNBL.cpp.

References accountNumber.

Referenced by operator=(), and toString().

```
00078                                   {
00079     return accountNumber;
00080 }
```

5.16.3.3 std::string UNBL::GetAddress ( ) const [virtual]

Reimplemented from BANK.

Definition at line 62 of file UNBL.cpp.

References address.

Referenced by operator=().

```
00062                                   {
00063     return address;
00064 }
```

5.16.3.4 double UNBL::GetBalance ( ) const [virtual]

Reimplemented from BANK.

Definition at line 70 of file UNBL.cpp.

References balance.

Referenced by operator=(), and toString().

```
00070                                  {
00071     return balance;
00072 }
```

5.16.3.5 std::shared_ptr< OSTM > UNBL::getBaseCopy (std::shared_ptr< OSTM > *object*) [virtual]

getBaseCopy function, make deep copy of the object/pointer and Return a new std::shared_ptr<BANK> type object

Parameters

objTO	is a BANK type pointer for casting
obj	is a std::shared_ptr<BANK> return type

Reimplemented from OSTM.

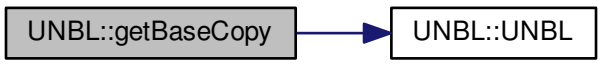
Definition at line 21 of file UNBL.cpp.

References UNBL().

Referenced by operator=().

```
00022 {
00023     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00024     std::shared_ptr<BANK> obj(new UNBL(objTO,object->Get_Version(),object->Get_Unique_ID()));
00025     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00026     return ostm_obj;
00027 }
```

Here is the call graph for this function:



5.16.3.6 std::string UNBL::GetFirstName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 94 of file UNBL.cpp.

References firstName.

Referenced by operator=(), and toString().

```
00094                                   {
00095     return firstName;
00096 }
```

5.16.3.7 std::string UNBL::GetFullname ( ) const [virtual]

Reimplemented from BANK.

Definition at line 102 of file UNBL.cpp.

References fullname.

Referenced by operator=().

```
00102                                   {
00103     return fullname;
00104 }
```

5.16.3.8 std::string UNBL::GetLastName ( ) const [virtual]

Reimplemented from BANK.

Definition at line 86 of file UNBL.cpp.

References lastName.

Referenced by operator=(), and toString().

```
00086                                   {
00087     return lastName;
00088 }
```

5.16.3.9 UNBL UNBL::operator= (const UNBL & *orig*) [inline]

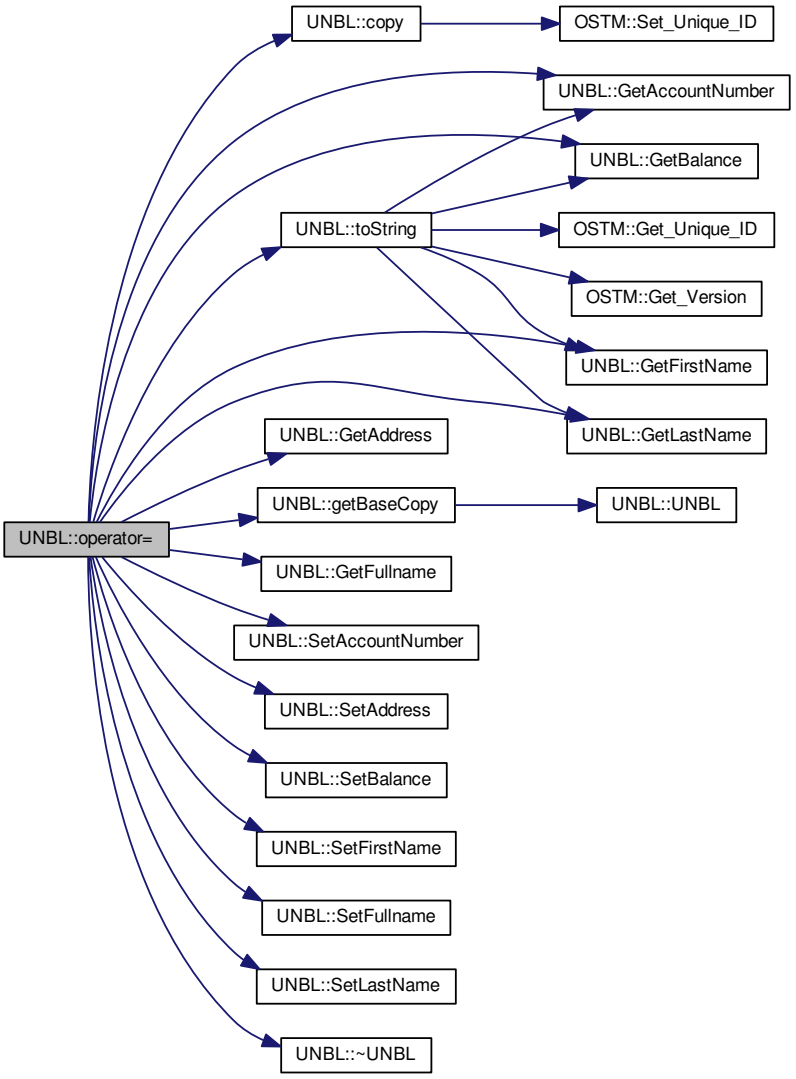
Operator

Definition at line 62 of file UNBL.h.

References accountNumber, address, balance, copy(), firstName, fullname, GetAccountNumber(), GetAddress(), GetBalance(), getBaseCopy(), GetFirstName(), GetFullname(), GetLastName(), lastName, SetAccountNumber(), SetAddress(), SetBalance(), SetFirstName(), SetFullname(), SetLastName(), toString(), and ~UNBL().

```
00062 {};
```

Here is the call graph for this function:



5.16.3.10 void UNBL::SetAccountNumber (int *accountNumber*) [virtual]

Reimplemented from BANK.

Definition at line 74 of file UNBL.cpp.

References accountNumber.

Referenced by operator=().

```
00074                                           {
00075     this->accountNumber = accountNumber;
00076 }
```

5.16.3.11 void UNBL::SetAddress (std::string *address*) [virtual]

Reimplemented from BANK.

Definition at line 58 of file UNBL.cpp.

References address.

Referenced by operator=().

```
00058                                       {
00059     this->address = address;
00060 }
```

5.16.3.12 void UNBL::SetBalance (double *balance*) [virtual]

Reimplemented from BANK.

Definition at line 66 of file UNBL.cpp.

References balance.

Referenced by operator=().

```
00066                                     {
00067     this->balance = balance;
00068 }
```

5.16.3.13 void UNBL::SetFirstName (std::string *firstName*) [virtual]

Reimplemented from BANK.

Definition at line 90 of file UNBL.cpp.

References firstName.

Referenced by operator=().

```
00090                                         {
00091     this->firstName = firstName;
00092 }
```

5.16.3.14 void UNBL::SetFullname (std::string *fullname*) [virtual]

Reimplemented from BANK.

Definition at line 98 of file UNBL.cpp.

References fullname.

Referenced by operator=().

```
00098                                       {
00099     this->fullname = fullname;
00100 }
```

5.16.3.15 void UNBL::SetLastName (std::string *lastName*) [virtual]

Reimplemented from BANK.

Definition at line 82 of file UNBL.cpp.

References lastName.

Referenced by operator=().

```
00082                                          {
00083     this->lastName = lastName;
00084 }
```

5.16.3.16 void UNBL::toString ( ) [virtual]

_cast, is use to cast bak the std::shared_ptr<OSTM> to the required type

toString function, displays the object values in formatted way

Reimplemented from OSTM.

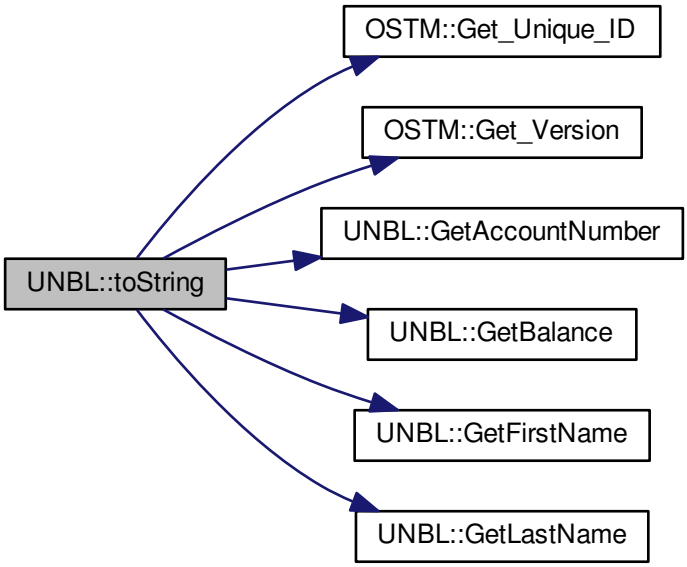
Definition at line 53 of file UNBL.cpp.

References OSTM::Get_Unique_ID(), OSTM::Get_Version(), GetAccountNumber(), GetBalance(), GetFirstName(), and GetLastName().

Referenced by operator=().

```
00054 {
00055     std::cout << "\nUNBL BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
       " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00056 }
```

Here is the call graph for this function:



5.16.4 Member Data Documentation

5.16.4.1 int UNBL::accountNumber [private]

Definition at line 95 of file UNBL.h.

Referenced by GetAccountNumber(), operator=(), SetAccountNumber(), and UNBL().

5.16.4.2 std::string UNBL::address [private]

Definition at line 97 of file UNBL.h.

Referenced by GetAddress(), operator=(), SetAddress(), and UNBL().

5.16.4.3 double UNBL::balance [private]

Definition at line 96 of file UNBL.h.

Referenced by GetBalance(), operator=(), SetBalance(), and UNBL().

5.16.4.4 std::string UNBL::firstName [private]

Definition at line 93 of file UNBL.h.

Referenced by GetFirstName(), operator=(), SetFirstName(), and UNBL().

5.16.4.5 std::string UNBL::fullname [private]

Definition at line 92 of file UNBL.h.

Referenced by GetFullname(), operator=(), SetFullname(), and UNBL().

5.16.4.6 std::string UNBL::lastName [private]

Definition at line 94 of file UNBL.h.

Referenced by GetLastName(), operator=(), SetLastName(), and UNBL().

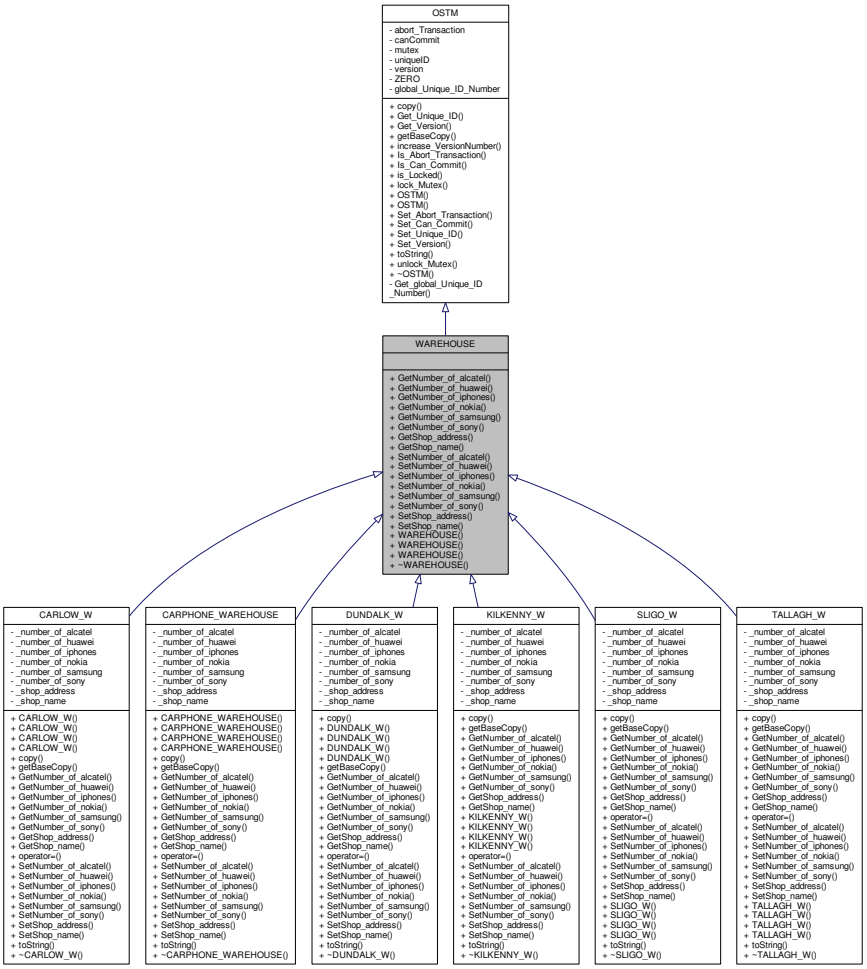
The documentation for this class was generated from the following files:

- UNBL.h
- UNBL.cpp

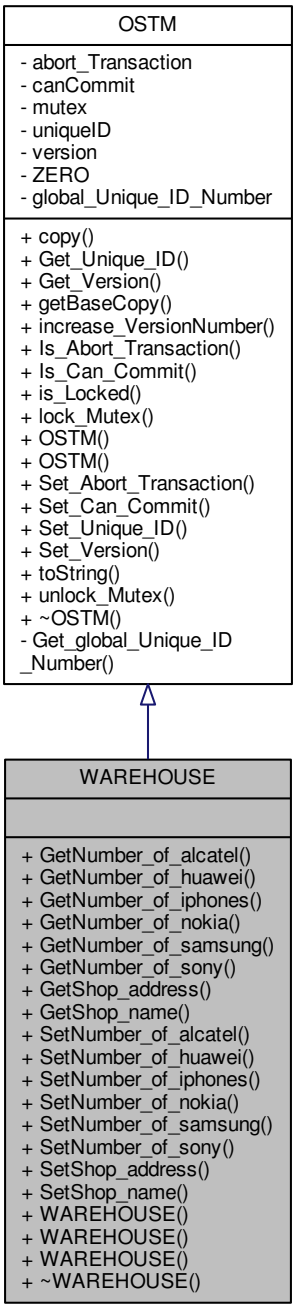
5.17 WAREHOUSE Class Reference

`#include <WAREHOUSE.h>`

Inheritance diagram for WAREHOUSE:



Collaboration diagram for WAREHOUSE:



Public Member Functions

- virtual int GetNumber_of_alcatel ()
- virtual int GetNumber_of_huawei ()
- virtual int GetNumber_of_iphones ()
- virtual int GetNumber_of_nokia ()
- virtual int GetNumber_of_samsung ()

- virtual int GetNumber_of_sony ()
- virtual std::string GetShop_address ()
- virtual std::string GetShop_name ()
- virtual void SetNumber_of_alcatel (int _number_of_alcatel)
- virtual void SetNumber_of_huawei (int _number_of_huawei)
- virtual void SetNumber_of_iphones (int _number_of_iphones)
- virtual void SetNumber_of_nokia (int _number_of_nokia)
- virtual void SetNumber_of_samsung (int _number_of_samsung)
- virtual void SetNumber_of_sony (int _number_of_sony)
- virtual void SetShop_address (std::string _shop_address)
- virtual void SetShop_name (std::string _shop_name)
- WAREHOUSE ()
- WAREHOUSE (int _version, int _unique_id)
- WAREHOUSE (const WAREHOUSE &orig)
- virtual ~WAREHOUSE ()

5.17.1 Detailed Description

WAREHOUSE inherit from OSTM library

Definition at line 16 of file WAREHOUSE.h.

5.17.2 Constructor & Destructor Documentation

5.17.2.1 WAREHOUSE::WAREHOUSE ( ) [inline]

Constructor

Definition at line 21 of file WAREHOUSE.h.

Referenced by WAREHOUSE().

```
00021                 :OSTM(){
00022
00023     };
```

5.17.2.2 WAREHOUSE::WAREHOUSE (int *_version*, int *_unique_id*) [inline]

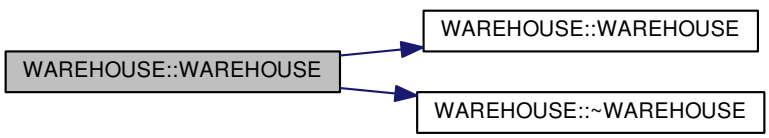
Custom Constructor

Definition at line 27 of file WAREHOUSE.h.

References WAREHOUSE(), and ~WAREHOUSE().

```
00027                                           : OSTM(_version, _unique_id){
00028
00029     };
```

Here is the call graph for this function:



5.17.2.3 WAREHOUSE::WAREHOUSE (const WAREHOUSE & *orig*)

Copy constructor

Definition at line 12 of file WAREHOUSE.cpp.

```
00012                                        {
00013 }
```

5.17.2.4 WAREHOUSE::~WAREHOUSE ( ) [virtual]

de-constructor

Definition at line 15 of file WAREHOUSE.cpp.

Referenced by WAREHOUSE().

```
00015                          {
00016 }
```

5.17.3 Member Function Documentation

5.17.3.1 virtual int WAREHOUSE::GetNumber_of_alcatel ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 44 of file WAREHOUSE.h.

```
00044 {};
```

5.17.3.2 virtual int WAREHOUSE::GetNumber_of_huawei ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 48 of file WAREHOUSE.h.

```
00048 {};
```

5.17.3.3 virtual int WAREHOUSE::GetNumber_of_iphones ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 54 of file WAREHOUSE.h.

```
00054 {};
```

5.17.3.4 virtual int WAREHOUSE::GetNumber_of_nokia ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 46 of file WAREHOUSE.h.

```
00046 {};
```

5.17.3.5 virtual int WAREHOUSE::GetNumber_of_samsung ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 52 of file WAREHOUSE.h.

```
00052 {};
```

5.17.3.6 virtual int WAREHOUSE::GetNumber_of_sony ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 50 of file WAREHOUSE.h.

```
00050 {};
```

5.17.3.7 virtual std::string WAREHOUSE::GetShop_address ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 58 of file WAREHOUSE.h.

```
00058 {};
```

5.17.3.8 virtual std::string WAREHOUSE::GetShop_name ( ) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 56 of file WAREHOUSE.h.

```
00056 {};
```

5.17.3.9 virtual void WAREHOUSE::SetNumber_of_alcatel (int *_number_of_alcatel*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 43 of file WAREHOUSE.h.

```
00043 {};
```

5.17.3.10 virtual void WAREHOUSE::SetNumber_of_huawei (int *_number_of_huawei*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 47 of file WAREHOUSE.h.

```
00047 {};
```

5.17.3.11 virtual void WAREHOUSE::SetNumber_of_iphones (int *_number_of_iphones*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 53 of file WAREHOUSE.h.

```
00053 {};
```

5.17.3.12 virtual void WAREHOUSE::SetNumber_of_nokia (int *_number_of_nokia*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 45 of file WAREHOUSE.h.

Referenced by _complex_warehouse_transfer_(), _nested_warehouse_transfer_(), and _warehouse_transfer_().

```
00045 {};
```

5.17.3.13 virtual void WAREHOUSE::SetNumber_of_samsung (int *_number_of_samsung*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 51 of file WAREHOUSE.h.

```
00051 {};
```

5.17.3.14 virtual void WAREHOUSE::SetNumber_of_sony (int *_number_of_sony*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 49 of file WAREHOUSE.h.

```
00049 {};
```

5.17.3.15 virtual void WAREHOUSE::SetShop_address (std::string *_shop_address*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 57 of file WAREHOUSE.h.

```
00057 {};
```

5.17.3.16 virtual void WAREHOUSE::SetShop_name (std::string *_shop_name*) [inline], [virtual]

Reimplemented in CARPHONE_WAREHOUSE, SLIGO_W, TALLAGH_W, CARLOW_W, DUNDALK_W, and KILKENNY_W.

Definition at line 55 of file WAREHOUSE.h.

```
00055 {};
```

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

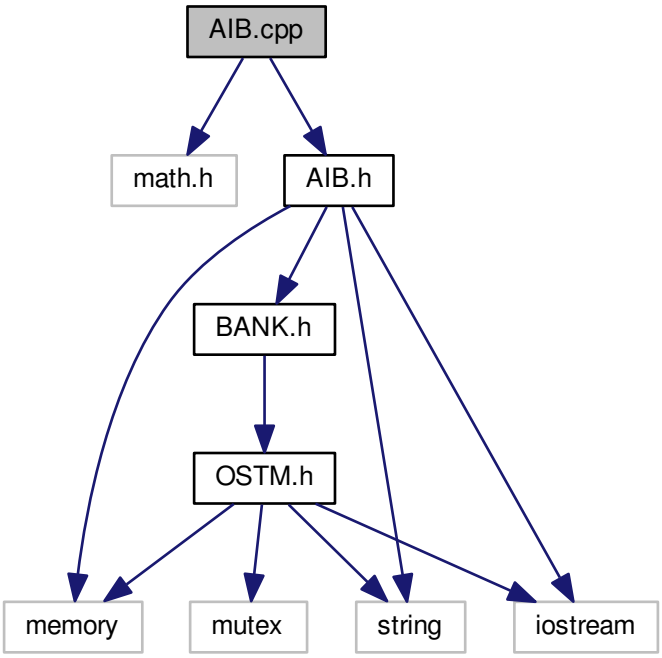
- WAREHOUSE.h
- WAREHOUSE.cpp

6 File Documentation

6.1 AIB.cpp File Reference

```
#include <math.h>
#include "AIB.h"
```

Include dependency graph for AIB.cpp:



6.2 AIB.cpp

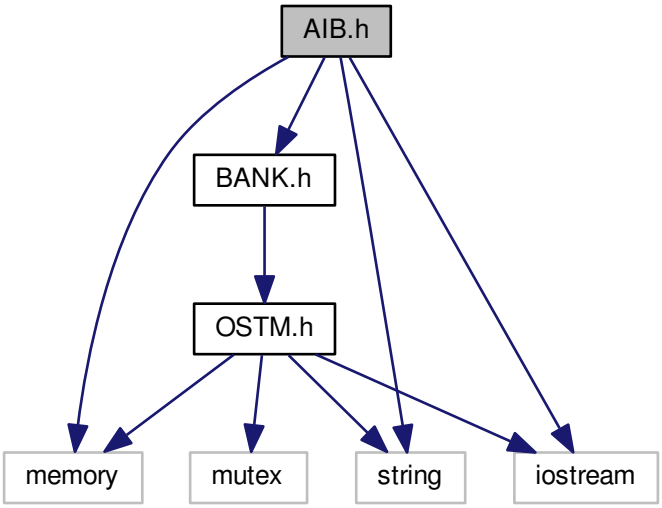
```
00001 /*
00002  * File:   AIB.cpp
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #include <math.h>
00010
00011 #include "AIB.h"
00012
00013
00014 AIB::AIB(const AIB& orig) {
00015 }
00016
00017 AIB::~AIB() {
00018 }
00024 std::shared_ptr<OSTM> AIB::getBaseCopy(std::shared_ptr<OSTM> object)
00025 {
00026
00027     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00028     std::shared_ptr<BANK> obj(new AIB(objTO, object->Get_Version(),object->Get_Unique_ID()));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00030     return ostm_obj;
00031 }
00037 void AIB::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00038
00039     std::shared_ptr<AIB> objTO = std::dynamic_pointer_cast<AIB>(to);
00040     std::shared_ptr<AIB> objFROM = std::dynamic_pointer_cast<AIB>(from);
00041     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00042     objTO->Set_Version(objFROM->Get_Version());
00043     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00044     objTO->SetBalance(objFROM->GetBalance());
00045 }
```

```
00049 //std::shared_ptr<AIB> AIB::_cast(std::shared_ptr<OSTM> _object){
00050 //
00051 //    return std::static_pointer_cast<AIB>(_object);
00052 //}
00056 void AIB::toString()
00057 {
00058     std::cout << "\nAIB BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
       " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00059 }
00060
00061 void AIB::SetAddress(std::string address) {
00062     this->address = address;
00063 }
00064
00065 std::string AIB::GetAddress() const {
00066     return address;
00067 }
00068
00069 void AIB::SetBalance(double balance) {
00070     this->balance = balance;
00071 }
00072
00073 double AIB::GetBalance() const {
00074     return balance;
00075 }
00076
00077 void AIB::SetAccountNumber(int accountNumber) {
00078     this->accountNumber = accountNumber;
00079 }
00080
00081 int AIB::GetAccountNumber() const {
00082     return accountNumber;
00083 }
00084
00085 void AIB::SetLastName(std::string lastName) {
00086     this->lastName = lastName;
00087 }
00088
00089 std::string AIB::GetLastName() const {
00090     return lastName;
00091 }
00092
00093 void AIB::SetFirstName(std::string firstName) {
00094     this->firstName = firstName;
00095 }
00096
00097 std::string AIB::GetFirstName() const {
00098     return firstName;
00099 }
00100
00101 void AIB::SetFullname(std::string fullname) {
00102     this->fullname = fullname;
00103 }
00104
00105 std::string AIB::GetFullname() const {
00106     return fullname;
00107 }
```

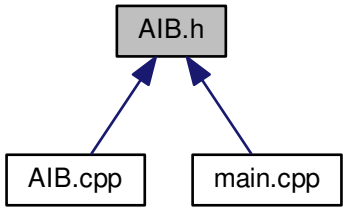
6.3 AIB.h File Reference

```
#include "BANK.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for AIB.h:



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



Classes

- class AIB

6.4 AIB.h

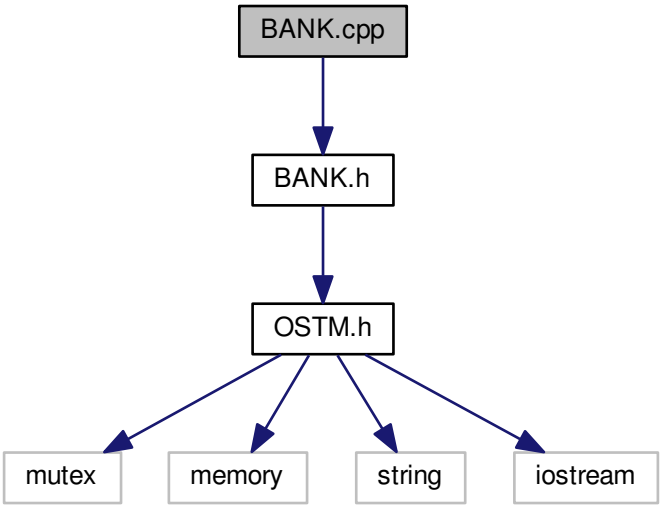
```
00001 /*
00002  * File:   AIB.h
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
```

```
00008
00009 #ifndef AIB_H
00010 #define AIB_H
00011 #include "BANK.h"
00012 #include <string>
00013 #include <memory>
00014 #include <iostream>
00018 class AIB : public BANK {
00019 public:
00023     AIB(): BANK()
00024     {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031
00032     };
00036     AIB(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address):
      BANK()
00037     {
00038         this->accountNumber = accountNumber;
00039         this->balance = balance;
00040         this->firstName = firstName;
00041         this->lastName = lastName;
00042         this->address = address;
00043         this->fullname = firstName + " " + lastName;
00044     };
00048     AIB(std::shared_ptr<BANK> obj, int _version, int _unique_id): BANK(_version, _unique_id)
00049     {
00050
00051         this->accountNumber = obj->GetAccountNumber();
00052         this->balance = obj->GetBalance();
00053         this->firstName = obj->GetFirstName();
00054         this->lastName = obj->GetLastName();
00055         this->address = obj->GetAddress();
00056         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00057
00058     };
00062     AIB(const AIB& orig);
00066     AIB operator=(const AIB& orig){};
00070     virtual ~AIB();
00071
00072     /*
00073      * Implement OSTM virtual methods
00074      */
00075    // virtual std::shared_ptr<AIB> _cast(std::shared_ptr<OSTM> _object);
00076     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00077     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00078     virtual void toString();
00079
00080     /*
00081      * Implement BANK virtual methods
00082      */
00083     virtual void SetAddress(std::string address);
00084     virtual std::string GetAddress() const;
00085     virtual void SetBalance(double balance);
00086     virtual double GetBalance() const;
00087     virtual void SetAccountNumber(int accountNumber);
00088     virtual int GetAccountNumber() const;
00089     virtual void SetLastName(std::string lastName);
00090     virtual std::string GetLastName() const;
00091     virtual void SetFirstName(std::string firstName);
00092     virtual std::string GetFirstName() const;
00093     virtual void SetFullname(std::string fullname);
00094     virtual std::string GetFullname() const;
00095
00096 private:
00097     std::string fullname;
00098     std::string firstName;
00099     std::string lastName;
00100     int accountNumber;
00101     double balance;
00102     std::string address;
00103
00104
00105 };
00106
00107 #endif /* AIB_H */
```

6.5 BANK.cpp File Reference

```
#include "BANK.h"
```

Include dependency graph for BANK.cpp:



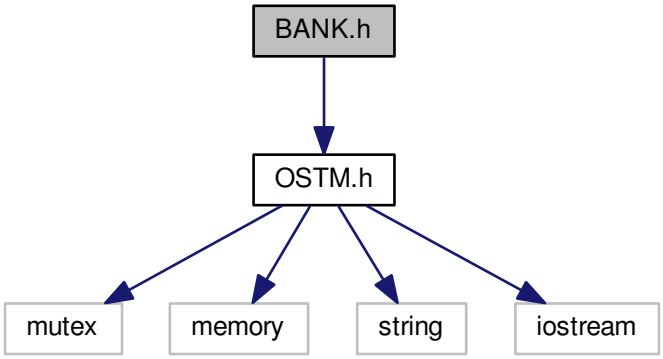
6.6 BANK.cpp

```
00001 /*
00002  * File:   BANK.cpp
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #include "BANK.h"
00010
00011 BANK::BANK(const BANK& orig) {
00012 }
00013
00014 BANK::~BANK() {
00015 }
00016
```

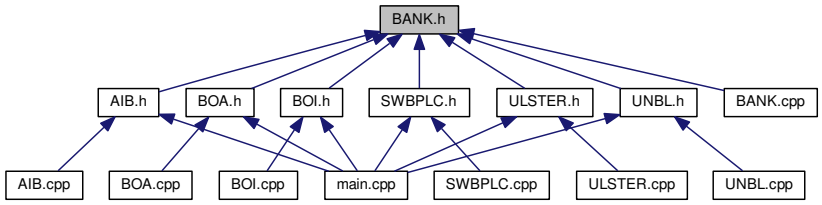
6.7 BANK.h File Reference

```
#include "OSTM.h"
```

Include dependency graph for BANK.h:



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



Classes

- class BANK

6.8 BANK.h

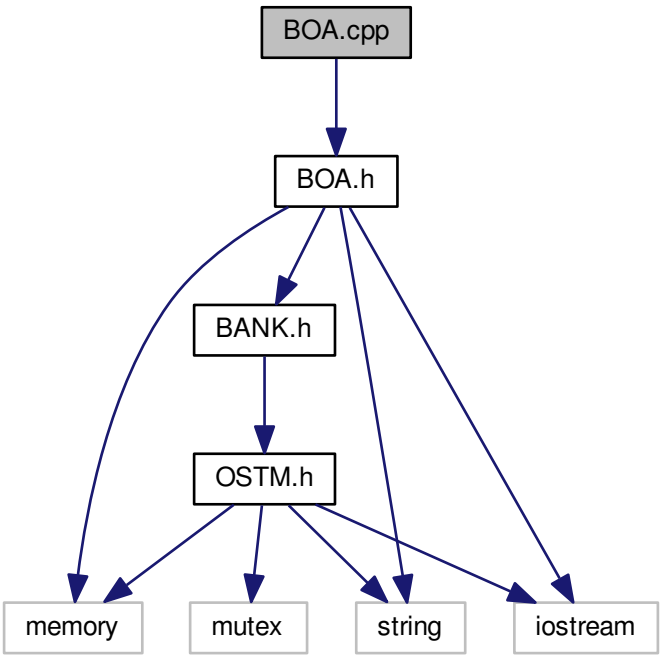
```
00001 /*
00002  * File:   BANK.h
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #ifndef BANK_H
00010 #define BANK_H
00011 #include "OSTM.h"
00016 class BANK : public OSTM {
00017
00018
00019 public:
00023     BANK(): OSTM(){
00024
00025     };
00029     BANK(int _version, int _unique_id) : OSTM(_version, _unique_id){
```

```
00030
00031     };
00035     BANK(const BANK& orig);
00039     virtual ~BANK();
00040
00041     /*
00042      * Bank specific virtual functions
00043      */
00044     virtual void SetAddress(std::string address){};
00045     virtual std::string GetAddress() const{};
00046     virtual void SetBalance(double balance){};
00047     virtual double GetBalance() const{};
00048     virtual void SetAccountNumber(int accountNumber){};
00049     virtual int GetAccountNumber() const{};
00050     virtual void SetLastName(std::string lastName){};
00051     virtual std::string GetLastName() const{};
00052     virtual void SetFirstName(std::string firstName){};
00053     virtual std::string GetFirstName() const{};
00054     virtual void SetFullname(std::string fullname){};
00055     virtual std::string GetFullname() const{};
00056
00057 private:
00058
00059 };
00060
00061 #endif /* BANK_H */
00062
```

6.9 BOA.cpp File Reference

`#include "BOA.h"`

Include dependency graph for BOA.cpp:



6.10 BOA.cpp

```
00001 /*
```

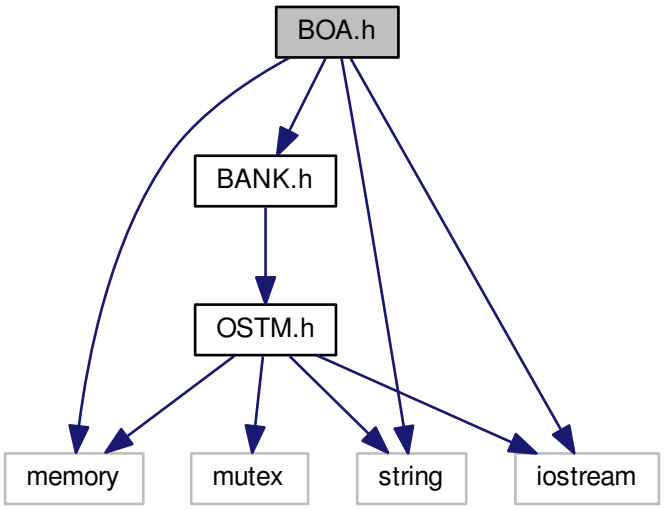
```
00002  * File:   BOA.cpp
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #include "BOA.h"
00010
00011
00012 BOA::BOA(const BOA& orig) {
00013 }
00014
00015 BOA::~BOA() {
00016 }
00022 std::shared_ptr<OSTM> BOA::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024         std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00025     std::shared_ptr<BANK> obj(new BOA(objTO,object->Get_Version(),object->Get_Unique_ID()));
00026         std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00027     return ostm_obj;
00028 }
00034 void BOA::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00035
00036     std::shared_ptr<BOA> objTO = std::dynamic_pointer_cast<BOA>(to);
00037     std::shared_ptr<BOA> objFROM = std::dynamic_pointer_cast<BOA>(from);
00038     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00039     objTO->Set_Version(objFROM->Get_Version());
00040     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00041     objTO->SetBalance(objFROM->GetBalance());
00042
00043 }
00047 //std::shared_ptr<BOA> BOA::_cast(std::shared_ptr<OSTM> _object){
00048 //
00049 //    return std::static_pointer_cast<BOA>(_object);
00050 //}
00054 void BOA::toString()
00055 {
00056    // std::cout << "\nUnique ID : " << this->GetUniqueID() << "\nInt value : " << this->GetV_int() <<
       "\nDouble value : " << this->GetV_double() << "\nFloat value : " << this->GetV_float() << "\nString value : " <<
       this->GetV_string()  << "\nVersion number : " << this->GetVersion() << "\nLoad Counter : "<<
       this->GetLoadCounter() << "\nWrite Counter : "<< this->GetWriteCounter() << std::endl;
00057      std::cout << "\nBOA BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account
       : " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00058 }
00059
00060 void BOA::SetAddress(std::string address) {
00061     this->address = address;
00062 }
00063
00064 std::string BOA::GetAddress() const {
00065     return address;
00066 }
00067
00068 void BOA::SetBalance(double balance) {
00069     this->balance = balance;
00070 }
00071
00072 double BOA::GetBalance() const {
00073     return balance;
00074 }
00075
00076 void BOA::SetAccountNumber(int accountNumber) {
00077     this->accountNumber = accountNumber;
00078 }
00079
00080 int BOA::GetAccountNumber() const {
00081     return accountNumber;
00082 }
00083
00084 void BOA::SetLastName(std::string lastName) {
00085     this->lastName = lastName;
00086 }
00087
00088 std::string BOA::GetLastName() const {
00089     return lastName;
00090 }
00091
00092 void BOA::SetFirstName(std::string firstName) {
00093     this->firstName = firstName;
00094 }
00095
00096 std::string BOA::GetFirstName() const {
00097     return firstName;
00098 }
```

```
00099
00100 void BOA::SetFullname(std::string fullname) {
00101     this->fullname = fullname;
00102 }
00103
00104 std::string BOA::GetFullname() const {
00105     return fullname;
00106 }
00107
```

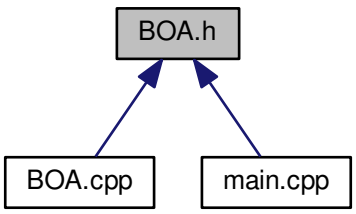
6.11 BOA.h File Reference

```
#include "BANK.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for BOA.h:



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



Classes

- class BOA

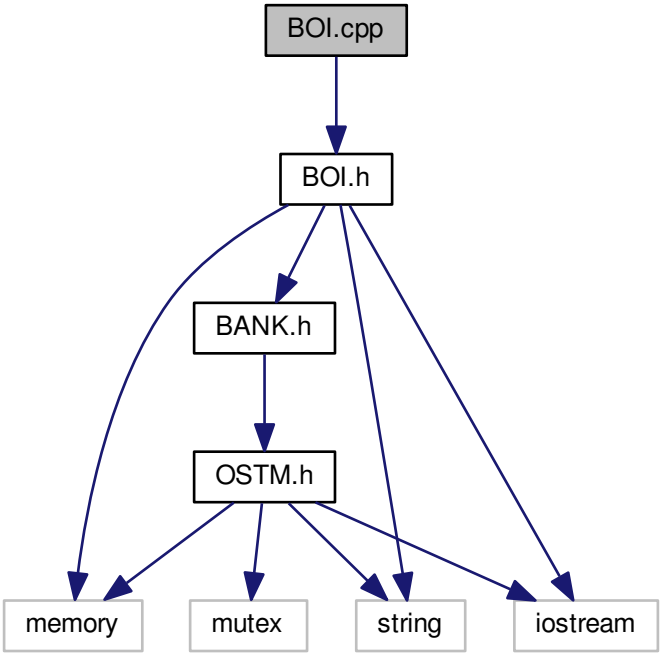
6.12 BOA.h

```
00001 /*
00002  * File:   BOA.h
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #ifndef BOA_H
00010 #define BOA_H
00011 #include "BANK.h"
00012 #include <string>
00013 #include <memory>
00014 #include <iostream>
00018 class BOA : public BANK {
00019 public:
00020
00024     BOA() : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
00035     BOA(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address) :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
00046     BOA(std::shared_ptr<BANK> obj, int _version, int _unique_id) : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
00055
00056
00060     BOA(const BOA& orig);
00064     BOA operator=(const BOA& orig) {
00065     };
00069     virtual ~BOA();
00070
00071     /*
00072      * Implement OSTM virtual methods
00073      */
00074     //virtual std::shared_ptr<BOA> _cast(std::shared_ptr<OSTM> _object);
00075     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00076     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00077     virtual void toString();
00078
00079     /*
00080      * Implement BANK virtual methods
00081      */
00082     virtual void SetAddress(std::string address);
00083     virtual std::string GetAddress() const;
00084     virtual void SetBalance(double balance);
00085     virtual double GetBalance() const;
00086     virtual void SetAccountNumber(int accountNumber);
00087     virtual int GetAccountNumber() const;
00088     virtual void SetLastName(std::string lastName);
00089     virtual std::string GetLastName() const;
00090     virtual void SetFirstName(std::string firstName);
00091     virtual std::string GetFirstName() const;
00092     virtual void SetFullname(std::string fullname);
00093     virtual std::string GetFullname() const;
00094 private:
00095     std::string fullname;
```

```
00096     std::string firstName;
00097     std::string lastName;
00098     int accountNumber;
00099     double balance;
00100     std::string address;
00101
00102 };
00103
00104 #endif /* BOA_H */
00105
```

6.13 BOI.cpp File Reference

`#include "BOI.h"`
Include dependency graph for BOI.cpp:



6.14 BOI.cpp

```
00001
00002 /*
00003  * File:   BOI.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "BOI.h"
00011
00012 BOI::~BOI() {
00013 }
00014
00015 BOI::BOI(const BOI& orig) {
00016 }
```

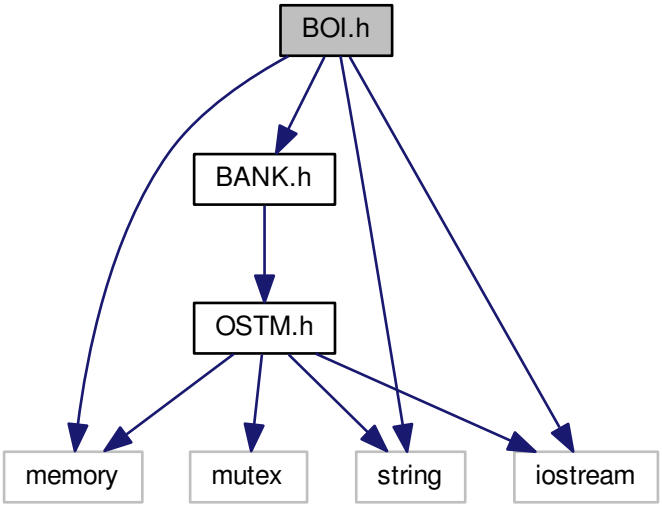
```
00022 std::shared_ptr<OSTM> BOI::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024
00025     std::shared_ptr<BOI> objTO = std::dynamic_pointer_cast<BOI>(object);
00026     std::shared_ptr<BOI> obj(new BOI(objTO,object->Get_Version(),object->Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
00035 void BOI::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00036
00037     std::shared_ptr<BOI> objTO = std::dynamic_pointer_cast<BOI>(to);
00038     std::shared_ptr<BOI> objFROM = std::dynamic_pointer_cast<BOI>(from);
00039     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00040     objTO->Set_Version(objFROM->Get_Version());
00041     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00042     objTO->SetBalance(objFROM->GetBalance());
00043 }
00047 //std::shared_ptr<BOI> BOI::_cast(std::shared_ptr<OSTM> _object){
00048 //
00049 //    return std::static_pointer_cast<BOI>(_object);
00050 //}
00054 void BOI::toString()
00055 {
00056    std::cout << "\nBOI BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
      " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00057 }
00058 void BOI::SetAddress(std::string address) {
00059     this->address = address;
00060 }
00061
00062 std::string BOI::GetAddress() const {
00063     return address;
00064 }
00065
00066 void BOI::SetBalance(double balance) {
00067     this->balance = balance;
00068 }
00069
00070 double BOI::GetBalance() const {
00071     return balance;
00072 }
00073
00074 void BOI::SetAccountNumber(int accountNumber) {
00075     this->accountNumber = accountNumber;
00076 }
00077
00078 int BOI::GetAccountNumber() const {
00079     return accountNumber;
00080 }
00081
00082 void BOI::SetLastName(std::string lastName) {
00083     this->lastName = lastName;
00084 }
00085
00086 std::string BOI::GetLastName() const {
00087     return lastName;
00088 }
00089
00090 void BOI::SetFirstName(std::string firstName) {
00091     this->firstName = firstName;
00092 }
00093
00094 std::string BOI::GetFirstName() const {
00095     return firstName;
00096 }
00097
00098 void BOI::SetFullname(std::string fullname) {
00099     this->fullname = fullname;
00100 }
00101
00102 std::string BOI::GetFullname() const {
00103     return fullname;
00104 }
00105
```

6.15 BOI.h File Reference

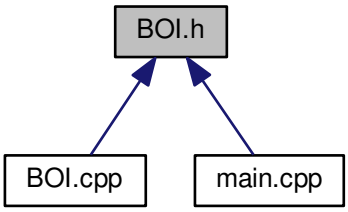
```
#include "BANK.h"
```

```
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for BOI.h:



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



Classes

- class BOI

6.16 BOI.h

```
00001
00002 /*
00003  * File:   BOI.h
```

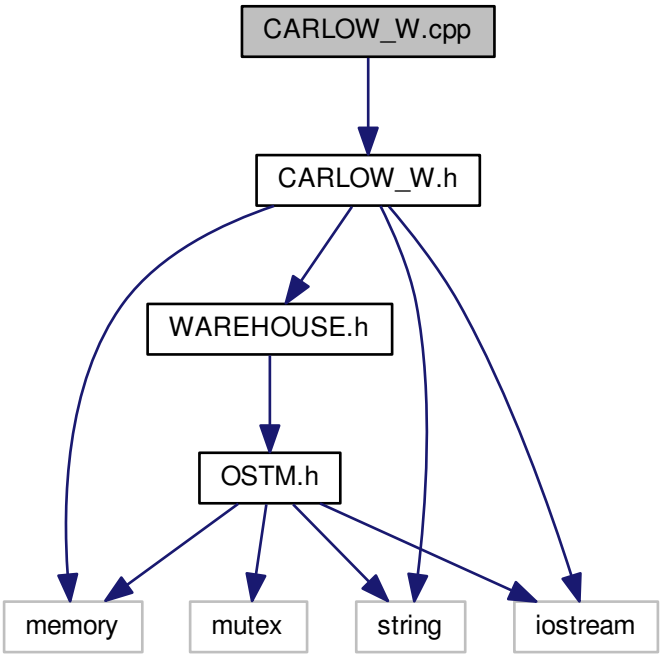
```
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef BOI_H
00011 #define BOI_H
00012 #include "BANK.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class BOI: public BANK {
00020 public:
00024     BOI(): BANK()
00025     {
00026         this->accountNumber = 0;
00027         this->balance = 50;
00028         this->firstName = "Joe";
00029         this->lastName = "Blog";
00030         this->address = "High street, Carlow";
00031         this->fullname = firstName + " " + lastName;
00032
00033     }
00037     BOI(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address):
      BANK()
00038     {
00039         this->accountNumber = accountNumber;
00040         this->balance = balance;
00041         this->firstName = firstName;
00042         this->lastName = lastName;
00043         this->address = address;
00044         this->fullname = firstName + " " + lastName;
00045     };
00049     BOI(std::shared_ptr<BOI> obj, int _version, int _unique_id): BANK(_version, _unique_id)
00050     {
00051         this->accountNumber = obj->GetAccountNumber();
00052         this->balance = obj->GetBalance();
00053         this->firstName = obj->GetFirstName();
00054         this->lastName = obj->GetLastName();
00055         this->address = obj->GetAddress();
00056         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00057     };
00061     BOI(const BOI& orig);
00065     BOI operator=(const BOI& orig){};
00069     virtual ~BOI();
00070
00071     /*
00072      * Implement OSTM virtual methods
00073      */
00074    // virtual std::shared_ptr<BOI> _cast(std::shared_ptr<OSTM> _object);
00075     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00076     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00077     virtual void toString();
00078
00079     /*
00080      * Implement BANK virtual methods
00081      */
00082     virtual void SetAddress(std::string address);
00083     virtual std::string GetAddress() const;
00084     virtual void SetBalance(double balance);
00085     virtual double GetBalance() const;
00086     virtual void SetAccountNumber(int accountNumber);
00087     virtual int GetAccountNumber() const;
00088     virtual void SetLastName(std::string lastName);
00089     virtual std::string GetLastName() const;
00090     virtual void SetFirstName(std::string firstName);
00091     virtual std::string GetFirstName() const;
00092     virtual void SetFullname(std::string fullname);
00093     virtual std::string GetFullname() const;
00094
00095 private:
00096     std::string fullname;
00097     std::string firstName;
00098     std::string lastName;
00099     int accountNumber;
00100     double balance;
00101     std::string address;
00102
00103 };
00104
00105 #endif /* BOI_H */
00106
00107
00108     //virtual std::string get_class();
00109
```

```
00110    //
00111     //virtual bool get(std::shared_ptr<OSTM> object);
00112
00114 // * To change this license header, choose License Headers in Project Properties.
00115 // * To change this template file, choose Tools | Templates
00116 // * and open the template in the editor.
00117 // */
00118 //
00120 // * File:   BOI.h
00121 // * Author: zoltan
00122 // *
00123 // * Created on January 19, 2018, 6:37 PM
00124 // */
00125 //
00126 //#ifndef BOI_H
00127 //#define BOI_H
00128 //#include "OSTM.h"
00129 //#include <string>
00130 //#include <memory>
00131 //#include <iostream>
00132 //
00133 //class BOI: public OSTM {
00134 //public:
00135 //    BOI(): OSTM()
00136 //    {
00137 //        this->accountNumber = 0;
00138 //        this->balance = 50;
00139 //        this->firstName = "Joe";
00140 //        this->lastName = "Blog";
00141 //        this->address = "High street, Carlow";
00142 //        this->fullname = firstName + " " + lastName;
00143 //
00144 //    }
00145 //    BOI(int accountNumber, double balance, std::string firstName, std::string lastName, std::string
       address): OSTM()
00146 //    {
00147 //        this->accountNumber = accountNumber;
00148 //        this->balance = balance;
00149 //        this->firstName = firstName;
00150 //        this->lastName = lastName;
00151 //        this->address = address;
00152 //        this->fullname = firstName + " " + lastName;
00153 //    };
00154 //
00155 //     BOI(OSTM& obj, int _version, int _unique_id): OSTM(_version, _unique_id)
00156 //    {
00163 //          this->accountNumber = obj.GetAccountNumber();
00164 //        this->balance = obj.GetBalance();
00165 //        this->firstName = obj.GetFirstName();
00166 //        this->lastName = obj.GetLastName();
00167 //        this->address = obj.GetAddress();
00168 //        this->fullname = obj.GetFirstName() + " " + obj.GetLastName();
00175 //    };
00176 //
00177 //     BOI(std::shared_ptr<OSTM> obj, int _version, int _unique_id): OSTM(_version, _unique_id)
00178 //    {
00179 //        this->accountNumber = obj->GetAccountNumber();
00180 //        this->balance = obj->GetBalance();
00181 //        this->firstName = obj->GetFirstName();
00182 //        this->lastName = obj->GetLastName();
00183 //        this->address = obj->GetAddress();
00184 //        this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00185 //    };
00186 //
00187 //
00188 //    BOI(const BOI& orig);
00189 //    BOI operator=(const BOI& orig){};
00190 //    virtual ~BOI();
00191 //
00192 //    virtual std::shared_ptr<BOI> _cast(std::shared_ptr<OSTM> _object);
00193 //    virtual std::shared_ptr<BOI> getBaseCopy(OSTM& object);
00194 //    virtual std::shared_ptr<BOI> getBaseCopy(std::shared_ptr<OSTM> object);
00195 //    virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00196 //    virtual void toString();
00197 //    virtual void SetAddress(std::string address);
00198 //    virtual std::string GetAddress() const;
00199 //    virtual void SetBalance(double balance);
00200 //    virtual double GetBalance() const;
00201 //    virtual void SetAccountNumber(int accountNumber);
00202 //    virtual int GetAccountNumber() const;
00203 //    virtual void SetLastName(std::string lastName);
00204 //    virtual std::string GetLastName() const;
00205 //    virtual void SetFirstName(std::string firstName);
00206 //    virtual std::string GetFirstName() const;
00207 //    virtual void SetFullname(std::string fullname);
00208 //    virtual std::string GetFullname() const;
00209 //
```

```
00210 //private:
00211 //    std::string fullname;
00212 //    std::string firstName;
00213 //    std::string lastName;
00214 //    int accountNumber;
00215 //    double balance;
00216 //    std::string address;
00217 //
00218 //};
00219 //
00220 //#endif /* BOI_H */
00221 //
00222 //
00223 //    //virtual std::string get_class();
00224 //
00225 //   //
00226 //    //virtual bool get(std::shared_ptr<OSTM> object);
00227 //
```

6.17 CARLOW_W.cpp File Reference

`#include "CARLOW_W.h"`
Include dependency graph for CARLOW_W.cpp:



6.18 CARLOW_W.cpp

```
00001
00002 /*
00003  * File:   CARLOW_W.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
```

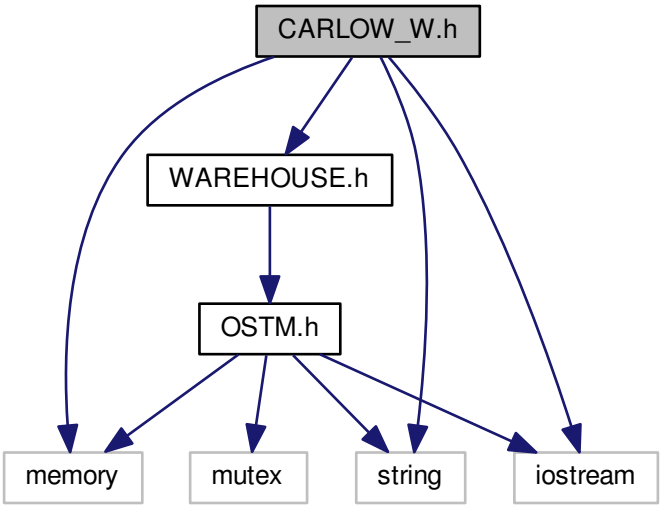
```
00009 #include "CARLOW_W.h"
00010
00011
00012 //CARLOW_W::CARLOW_W() {
00013 //}
00014 CARLOW_W::~CARLOW_W() {
00015 }
00016
00017 CARLOW_W::CARLOW_W(const CARLOW_W& orig) {
00018 }
00024 std::shared_ptr<OSTM> CARLOW_W::getBaseCopy(std::shared_ptr<OSTM> object)
00025 {
00026
00027     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00028     std::shared_ptr<WAREHOUSE> obj(new CARLOW_W(objTO, object->Get_Version(),object->Get_Unique_ID(
      )));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00030     return ostm_obj;
00031 }
00037 void CARLOW_W::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00038
00039     std::shared_ptr<CARLOW_W> objTO = std::dynamic_pointer_cast<CARLOW_W>(to);
00040     std::shared_ptr<CARLOW_W> objFROM = std::dynamic_pointer_cast<CARLOW_W>(from);
00041     objTO->_shop_address = objFROM->GetShop_address();
00042     objTO->_shop_name = objFROM->GetShop_name();
00043     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00044     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00045     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00046     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00047     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00048     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00049     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00050     objTO->Set_Version(objFROM->Get_Version());
00051
00052
00053 }
00057 //std::shared_ptr<CARLOW_W> CARLOW_W::_cast(std::shared_ptr<OSTM> _object){
00058 //
00059 //    return std::static_pointer_cast<CARLOW_W>(_object);
00060 //}
00064 void CARLOW_W::toString()
00065 {
00066    std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00067 }
00068
00069
00070
00071 void CARLOW_W::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00072     this->_number_of_alcatel = _number_of_alcatel;
00073 }
00074
00075 int CARLOW_W::GetNumber_of_alcatel(){
00076     return _number_of_alcatel;
00077 }
00078
00079 void CARLOW_W::SetNumber_of_nokia(int
      _number_of_nokia) {
00080     this->_number_of_nokia = _number_of_nokia;
00081 }
00082
00083 int CARLOW_W::GetNumber_of_nokia(){
00084     return _number_of_nokia;
00085 }
00086
00087 void CARLOW_W::SetNumber_of_huawei(int
      _number_of_huawei) {
00088     this->_number_of_huawei = _number_of_huawei;
00089 }
00090
00091 int CARLOW_W::GetNumber_of_huawei(){
00092     return _number_of_huawei;
00093 }
00094
00095 void CARLOW_W::SetNumber_of_sony(int _number_of_sony) {
00096     this->_number_of_sony = _number_of_sony;
00097 }
00098
```

```
00099 int CARLOW_W::GetNumber_of_sony(){
00100     return _number_of_sony;
00101 }
00102
00103 void CARLOW_W::SetNumber_of_samsung(int
      _number_of_samsung) {
00104     this->_number_of_samsung = _number_of_samsung;
00105 }
00106
00107 int CARLOW_W::GetNumber_of_samsung(){
00108     return _number_of_samsung;
00109 }
00110
00111 void CARLOW_W::SetNumber_of_iphones(int
      _number_of_iphones) {
00112     this->_number_of_iphones = _number_of_iphones;
00113 }
00114
00115 int CARLOW_W::GetNumber_of_iphones(){
00116     return _number_of_iphones;
00117 }
00118
00119 void CARLOW_W::SetShop_name(std::string _shop_name) {
00120     this->_shop_name = _shop_name;
00121 }
00122
00123 std::string CARLOW_W::GetShop_name(){
00124     return _shop_name;
00125 }
00126
00127 void CARLOW_W::SetShop_address(std::string
      _shop_address) {
00128     this->_shop_address = _shop_address;
00129 }
00130
00131 std::string CARLOW_W::GetShop_address(){
00132     return _shop_address;
00133 }
00134
00135
00136
```

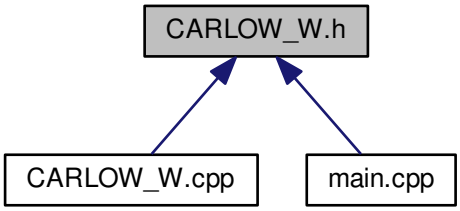
6.19 CARLOW_W.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for CARLOW_W.h:



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



Classes

- class CARLOW_W

6.20 CARLOW_W.h

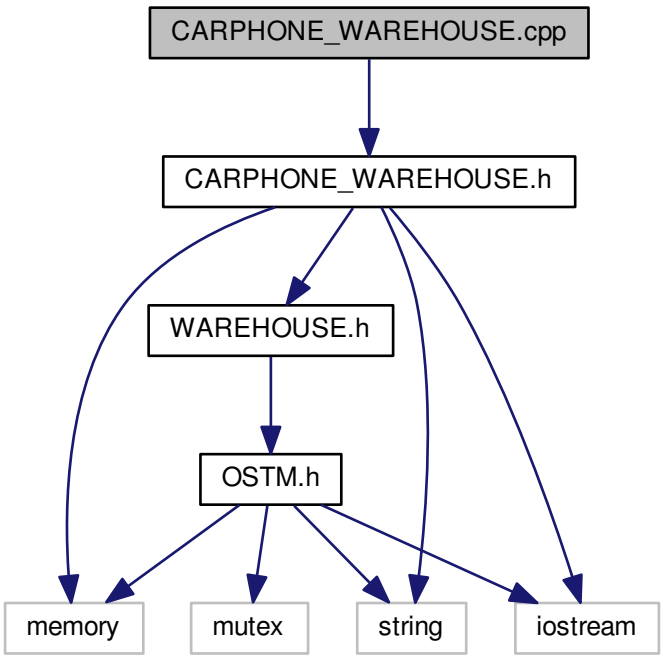
```
00001
00002 /*
00003  * File:   CARLOW_W.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
```

```
00008  */
00009
00010 #ifndef CARLOW_W_H
00011 #define CARLOW_W_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class CARLOW_W :public WAREHOUSE {
00020 public:
00024     CARLOW_W() : WAREHOUSE(){
00025
00026         this->_shop_address = "Carlow potato street";
00027         this->_shop_name = "CARLOW C_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
00038     CARLOW_W(std::string address, std::string shop_name, int iphone, int samsung, int sony, int
      huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     CARLOW_W(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     CARLOW_W(const CARLOW_W& orig);
00075     CARLOW_W operator=(const CARLOW_W& orig){};
00079     virtual ~CARLOW_W();
00080     /*
00081      * Implement OSTM virtual methods
00082      */
00083    // virtual std::shared_ptr<CARLOW_W> _cast(std::shared_ptr<OSTM> _object);
00084     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00085     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00086     virtual void toString();
00087     /*
00088      * Implement Warehouse methods
00089      */
00090     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00091     virtual int GetNumber_of_alcatel();
00092     virtual void SetNumber_of_nokia(int _number_of_nokia);
00093     virtual int GetNumber_of_nokia();
00094     virtual void SetNumber_of_huawei(int _number_of_huawei);
00095     virtual int GetNumber_of_huawei();
00096     virtual void SetNumber_of_sony(int _number_of_sony);
00097     virtual int GetNumber_of_sony();
00098     virtual void SetNumber_of_samsung(int _number_of_samsung);
00099     virtual int GetNumber_of_samsung();
00100     virtual void SetNumber_of_iphones(int _number_of_iphones);
00101     virtual int GetNumber_of_iphones();
00102     virtual void SetShop_name(std::string _shop_name);
00103     virtual std::string GetShop_name();
00104     virtual void SetShop_address(std::string _shop_address);
00105     virtual std::string GetShop_address();
00106
00107
00108 private:
00109     std::string _shop_address;
00110     std::string _shop_name;
00111     int _number_of_iphones;
00112     int _number_of_samsung;
00113     int _number_of_sony;
```

```
00114     int _number_of_huawei;
00115     int _number_of_nokia;
00116     int _number_of_alcatel;
00117
00118 };
00119
00120 #endif /* CARLOW_W_H */
00121
```

6.21 CARPHONE_WAREHOUSE.cpp File Reference

`#include "CARPHONE_WAREHOUSE.h"`
Include dependency graph for CARPHONE_WAREHOUSE.cpp:



6.22 CARPHONE_WAREHOUSE.cpp

```
00001
00002 /*
00003  * File:   CARPHONE_WAREHOUSE.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009 #include "CARPHONE_WAREHOUSE.h"
00010
00011 CARPHONE_WAREHOUSE::CARPHONE_WAREHOUSE(const
       CARPHONE_WAREHOUSE& orig) {
00012 }
00013
00014 CARPHONE_WAREHOUSE::~CARPHONE_WAREHOUSE() {
00015 }
00021 std::shared_ptr<OSTM> CARPHONE_WAREHOUSE::getBaseCopy(std::shared_ptr<OSTM>
       object)
```

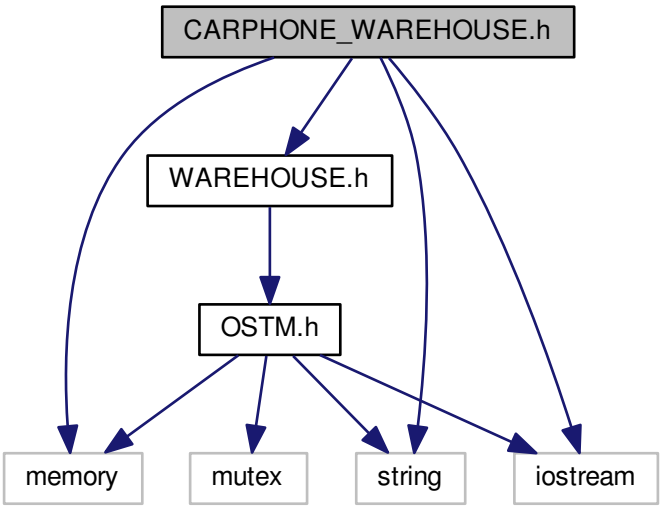
```
00022 {
00023
00024     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00025     std::shared_ptr<WAREHOUSE> obj(new CARPHONE_WAREHOUSE(objTO, object->Get_Version(),
      object->Get_Unique_ID()));
00026     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00027     return ostm_obj;
00028 }
00034 void CARPHONE_WAREHOUSE::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from)
      {
00035
00036     std::shared_ptr<CARPHONE_WAREHOUSE> objTO = std::dynamic_pointer_cast<
      CARPHONE_WAREHOUSE>(to);
00037     std::shared_ptr<CARPHONE_WAREHOUSE> objFROM = std::dynamic_pointer_cast<
      CARPHONE_WAREHOUSE>(from);
00038     objTO->_shop_address = objFROM->GetShop_address();
00039     objTO->_shop_name = objFROM->GetShop_name();
00040     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00041     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00042     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00043     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00044     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00045     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00046     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00047     objTO->Set_Version(objFROM->Get_Version());
00048
00049 }
00053 //std::shared_ptr<CARPHONE_WAREHOUSE> CARPHONE_WAREHOUSE::_cast(std::shared_ptr<OSTM> _object){
00054 //
00055 //    return std::static_pointer_cast<CARPHONE_WAREHOUSE>(_object);
00056 //}
00060 void CARPHONE_WAREHOUSE::toString()
00061 {
00062    std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00063 }
00064
00065
00066
00067 void CARPHONE_WAREHOUSE::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00068     this->_number_of_alcatel = _number_of_alcatel;
00069 }
00070
00071 int CARPHONE_WAREHOUSE::GetNumber_of_alcatel(){
00072     return _number_of_alcatel;
00073 }
00074
00075 void CARPHONE_WAREHOUSE::SetNumber_of_nokia(int
      _number_of_nokia) {
00076     this->_number_of_nokia = _number_of_nokia;
00077 }
00078
00079 int CARPHONE_WAREHOUSE::GetNumber_of_nokia(){
00080     return _number_of_nokia;
00081 }
00082
00083 void CARPHONE_WAREHOUSE::SetNumber_of_huawei(int
      _number_of_huawei) {
00084     this->_number_of_huawei = _number_of_huawei;
00085 }
00086
00087 int CARPHONE_WAREHOUSE::GetNumber_of_huawei(){
00088     return _number_of_huawei;
00089 }
00090
00091 void CARPHONE_WAREHOUSE::SetNumber_of_sony(int
      _number_of_sony) {
00092     this->_number_of_sony = _number_of_sony;
00093 }
00094
00095 int CARPHONE_WAREHOUSE::GetNumber_of_sony(){
00096     return _number_of_sony;
00097 }
00098
00099 void CARPHONE_WAREHOUSE::SetNumber_of_samsung(int
      _number_of_samsung) {
00100     this->_number_of_samsung = _number_of_samsung;
00101 }
```

```
00102
00103 int CARPHONE_WAREHOUSE::GetNumber_of_samsung(){
00104     return _number_of_samsung;
00105 }
00106
00107 void CARPHONE_WAREHOUSE::SetNumber_of_iphones(int
      _number_of_iphones) {
00108     this->_number_of_iphones = _number_of_iphones;
00109 }
00110
00111 int CARPHONE_WAREHOUSE::GetNumber_of_iphones(){
00112     return _number_of_iphones;
00113 }
00114
00115 void CARPHONE_WAREHOUSE::SetShop_name(std::string
      _shop_name) {
00116     this->_shop_name = _shop_name;
00117 }
00118
00119 std::string CARPHONE_WAREHOUSE::GetShop_name(){
00120     return _shop_name;
00121 }
00122
00123 void CARPHONE_WAREHOUSE::SetShop_address(std::string
      _shop_address) {
00124     this->_shop_address = _shop_address;
00125 }
00126
00127 std::string CARPHONE_WAREHOUSE::GetShop_address(){
00128     return _shop_address;
00129 }
00130
00131
00132
```

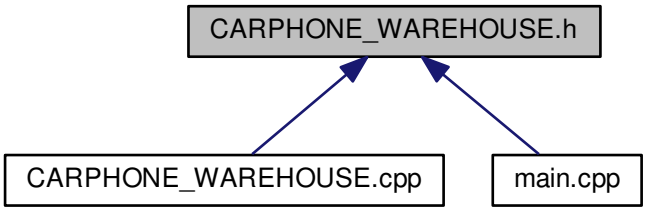
6.23 CARPHONE_WAREHOUSE.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for CARPHONE_WAREHOUSE.h:



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



Classes

- class CARPHONE_WAREHOUSE

6.24 CARPHONE_WAREHOUSE.h

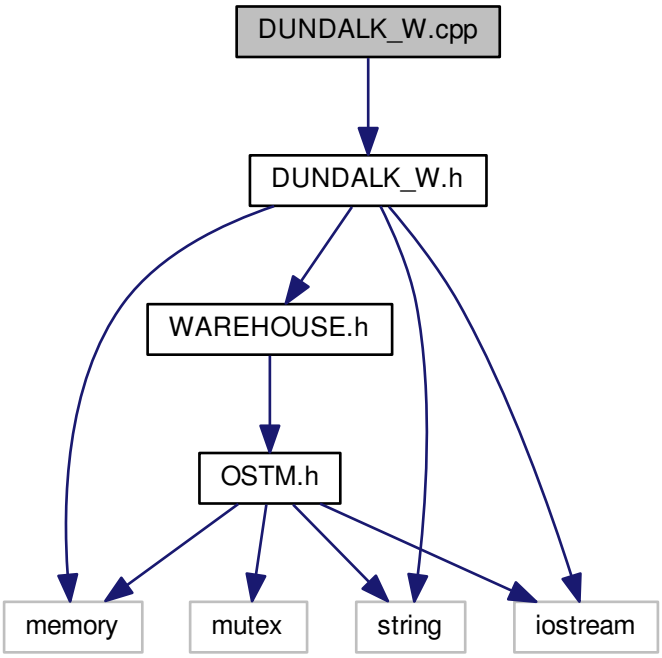
```
00001
00002 /*
00003  * File:   CARPHONE_WAREHOUSE.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef CARPHONE_WAREHOUSE_H
00011 #define CARPHONE_WAREHOUSE_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class CARPHONE_WAREHOUSE :public WAREHOUSE {
00020 public:
00024     CARPHONE_WAREHOUSE(): WAREHOUSE(){
00025
00026         this->_shop_address = "DUBLIN XII";
00027         this->_shop_name = "DISTRIBUTION CENTER";
00028         this->_number_of_iphones = 10000;
00029         this->_number_of_samsung = 10000;
00030         this->_number_of_sony = 10000;
00031         this->_number_of_huawei = 10000;
00032         this->_number_of_nokia = 10000;
00033         this->_number_of_alcatel = 10000;
00034     };
00038     CARPHONE_WAREHOUSE(std::string address, std::string shop_name, int iphone, int
      samsung, int sony, int huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     CARPHONE_WAREHOUSE(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
     WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
```

```
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     CARPHONE_WAREHOUSE(const CARPHONE_WAREHOUSE& orig);
00075     CARPHONE_WAREHOUSE operator=(const
      CARPHONE_WAREHOUSE& orig){};
00079     virtual ~CARPHONE_WAREHOUSE();
00080     /*
00081      * Implement OSTM virtual methods
00082      */
00083     //virtual std::shared_ptr<CARPHONE_WAREHOUSE> _cast(std::shared_ptr<OSTM> _object);
00084     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00085     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00086
00087
00088
00089     virtual void toString();
00090     /*
00091      * Implement Warehouse methods
00092      */
00093     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00094     virtual int GetNumber_of_alcatel();
00095     virtual void SetNumber_of_nokia(int _number_of_nokia);
00096     virtual int GetNumber_of_nokia();
00097     virtual void SetNumber_of_huawei(int _number_of_huawei);
00098     virtual int GetNumber_of_huawei();
00099     virtual void SetNumber_of_sony(int _number_of_sony);
00100     virtual int GetNumber_of_sony();
00101     virtual void SetNumber_of_samsung(int _number_of_samsung);
00102     virtual int GetNumber_of_samsung();
00103     virtual void SetNumber_of_iphones(int _number_of_iphones);
00104     virtual int GetNumber_of_iphones();
00105     virtual void SetShop_name(std::string _shop_name);
00106     virtual std::string GetShop_name();
00107     virtual void SetShop_address(std::string _shop_address);
00108     virtual std::string GetShop_address();
00109
00110 private:
00111     std::string _shop_address;
00112     std::string _shop_name;
00113     int _number_of_iphones;
00114     int _number_of_samsung;
00115     int _number_of_sony;
00116     int _number_of_huawei;
00117     int _number_of_nokia;
00118     int _number_of_alcatel;
00119
00120 };
00121
00122 #endif /* CARPHONE_WAREHOUSE_H */
00123
```

6.25 DUNDALK_W.cpp File Reference

```
#include "DUNDALK_W.h"
```

Include dependency graph for DUNDALK_W.cpp:



6.26 DUNDALK_W.cpp

```
00001
00002 /*
00003  * File:   DUNDALK_W.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "DUNDALK_W.h"
00011
00012 DUNDALK_W::~DUNDALK_W() {
00013 }
00014
00015 DUNDALK_W::DUNDALK_W(const DUNDALK_W& orig) {
00016 }
00022 std::shared_ptr<OSTM> DUNDALK_W::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new DUNDALK_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
00035 void DUNDALK_W::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00036
00037     std::shared_ptr<DUNDALK_W> objTO = std::dynamic_pointer_cast<DUNDALK_W>(to);
00038     std::shared_ptr<DUNDALK_W> objFROM = std::dynamic_pointer_cast<DUNDALK_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
```

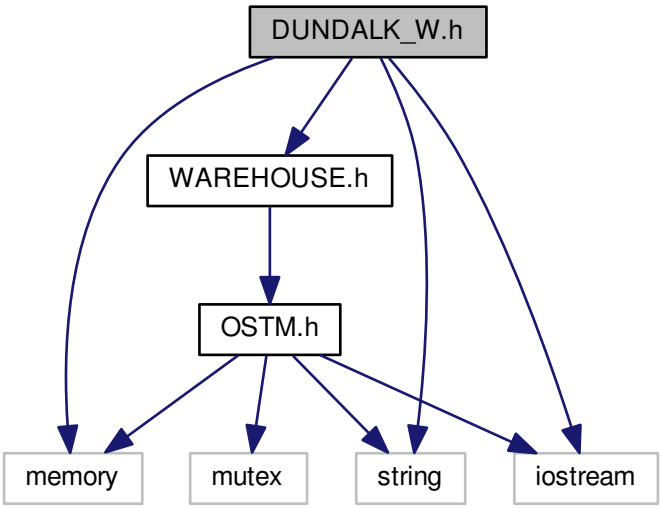
```
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
00055 //std::shared_ptr<DUNDALK_W> DUNDALK_W::_cast(std::shared_ptr<OSTM> _object){
00056 //
00057 //    return std::static_pointer_cast<DUNDALK_W>(_object);
00058 //}
00062 void DUNDALK_W::toString()
00063 {
00064    std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
00066
00067
00068
00069 void DUNDALK_W::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
00072
00073 int DUNDALK_W::GetNumber_of_alcatel(){
00074     return _number_of_alcatel;
00075 }
00076
00077 void DUNDALK_W::SetNumber_of_nokia(int
      _number_of_nokia) {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
00080
00081 int DUNDALK_W::GetNumber_of_nokia(){
00082     return _number_of_nokia;
00083 }
00084
00085 void DUNDALK_W::SetNumber_of_huawei(int
      _number_of_huawei) {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
00088
00089 int DUNDALK_W::GetNumber_of_huawei(){
00090     return _number_of_huawei;
00091 }
00092
00093 void DUNDALK_W::SetNumber_of_sony(int
      _number_of_sony) {
00094     this->_number_of_sony = _number_of_sony;
00095 }
00096
00097 int DUNDALK_W::GetNumber_of_sony(){
00098     return _number_of_sony;
00099 }
00100
00101 void DUNDALK_W::SetNumber_of_samsung(int
      _number_of_samsung) {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
00104
00105 int DUNDALK_W::GetNumber_of_samsung(){
00106     return _number_of_samsung;
00107 }
00108
00109 void DUNDALK_W::SetNumber_of_iphones(int
      _number_of_iphones) {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
00112
00113 int DUNDALK_W::GetNumber_of_iphones(){
00114     return _number_of_iphones;
00115 }
00116
00117 void DUNDALK_W::SetShop_name(std::string _shop_name) {
00118     this->_shop_name = _shop_name;
00119 }
00120
00121 std::string DUNDALK_W::GetShop_name(){
00122     return _shop_name;
```

```
00123 }
00124
00125 void DUNDALK_W::SetShop_address(std::string
      _shop_address) {
00126     this->_shop_address = _shop_address;
00127 }
00128
00129 std::string DUNDALK_W::GetShop_address(){
00130     return _shop_address;
00131 }
00132
00133
00134
```

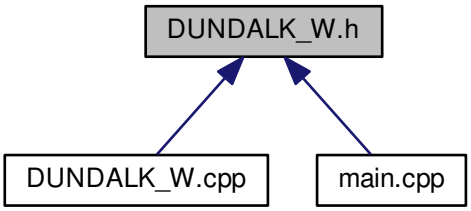
6.27 DUNDALK_W.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for DUNDALK_W.h:



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



Classes

- class DUNDALK_W

6.28 DUNDALK_W.h

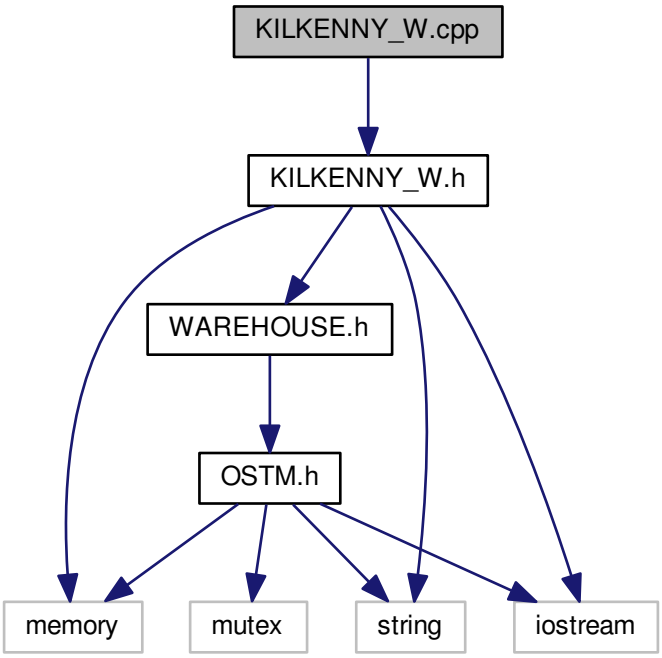
```
00001
00002 /*
00003  * File:   DUNDALK_W.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef DUNDALK_W_H
00011 #define DUNDALK_W_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class DUNDALK_W :public WAREHOUSE {
00020 public:
00024     DUNDALK_W() : WAREHOUSE(){
00025
00026         this->_shop_address = "Dundalk Busy Street";
00027         this->_shop_name = "DUNDALK D_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
00038     DUNDALK_W(std::string address, std::string shop_name, int iphone, int samsung, int sony, int
      huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     DUNDALK_W(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
```

```
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     DUNDALK_W(const DUNDALK_W& orig);
00075     DUNDALK_W operator=(const DUNDALK_W& orig){};
00079     virtual ~DUNDALK_W();
00080     /*
00081      * Implement OSTM virtual methods
00082      */
00083     //virtual std::shared_ptr<DUNDALK_W> _cast(std::shared_ptr<OSTM> _object);
00084     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00085     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00086     virtual void toString();
00087     /*
00088      * Implement Warehouse methods
00089      */
00090     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00091     virtual int GetNumber_of_alcatel();
00092     virtual void SetNumber_of_nokia(int _number_of_nokia);
00093     virtual int GetNumber_of_nokia();
00094     virtual void SetNumber_of_huawei(int _number_of_huawei);
00095     virtual int GetNumber_of_huawei();
00096     virtual void SetNumber_of_sony(int _number_of_sony);
00097     virtual int GetNumber_of_sony();
00098     virtual void SetNumber_of_samsung(int _number_of_samsung);
00099     virtual int GetNumber_of_samsung();
00100     virtual void SetNumber_of_iphones(int _number_of_iphones);
00101     virtual int GetNumber_of_iphones();
00102     virtual void SetShop_name(std::string _shop_name);
00103     virtual std::string GetShop_name();
00104     virtual void SetShop_address(std::string _shop_address);
00105     virtual std::string GetShop_address();
00106 
00107 
00108 private:
00109     std::string _shop_address;
00110     std::string _shop_name;
00111     int _number_of_iphones;
00112     int _number_of_samsung;
00113     int _number_of_sony;
00114     int _number_of_huawei;
00115     int _number_of_nokia;
00116     int _number_of_alcatel;
00117 
00118 };
00119 
00120 #endif /* DUNDALK_W_H */
00121 
```

6.29 KILKENNY_W.cpp File Reference

```
#include "KILKENNY_W.h"
```

Include dependency graph for KILKENNY_W.cpp:



6.30 KILKENNY_W.cpp

```
00001
00002 /*
00003  * File:   KILKENNY_W.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "KILKENNY_W.h"
00011
00012 KILKENNY_W::~KILKENNY_W() {
00013 }
00014
00015 KILKENNY_W::KILKENNY_W(const KILKENNY_W& orig) {
00016 }
00022 std::shared_ptr<OSTM> KILKENNY_W::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new KILKENNY_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);
00028     return ostm_obj;
00029 }
00035 void KILKENNY_W::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00036
00037     std::shared_ptr<KILKENNY_W> objTO = std::dynamic_pointer_cast<KILKENNY_W>(to);
00038     std::shared_ptr<KILKENNY_W> objFROM = std::dynamic_pointer_cast<KILKENNY_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
```

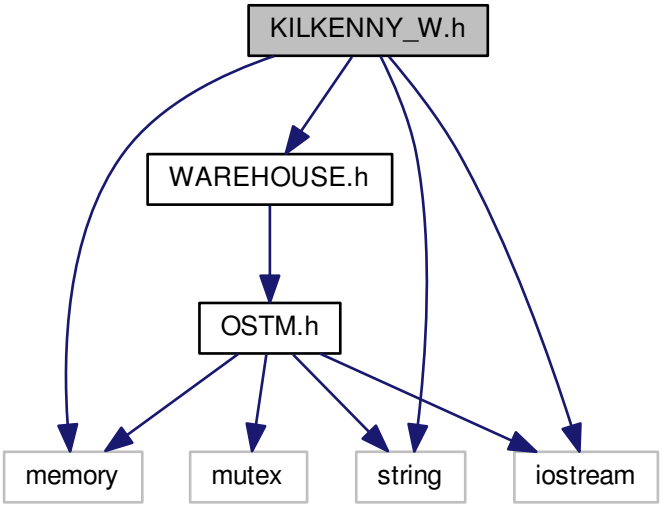
```
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
00055 //std::shared_ptr<KILKENNY_W> KILKENNY_W::_cast(std::shared_ptr<OSTM> _object){
00056 //
00057 //    return static_cast<std::shared_ptr<KILKENNY_W>>(_object);
00058 //}
00062 void KILKENNY_W::toString()
00063 {
00064    std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
00066
00067
00068
00069 void KILKENNY_W::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
00072
00073 int KILKENNY_W::GetNumber_of_alcatel(){
00074     return _number_of_alcatel;
00075 }
00076
00077 void KILKENNY_W::SetNumber_of_nokia(int
      _number_of_nokia) {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
00080
00081 int KILKENNY_W::GetNumber_of_nokia(){
00082     return _number_of_nokia;
00083 }
00084
00085 void KILKENNY_W::SetNumber_of_huawei(int
      _number_of_huawei) {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
00088
00089 int KILKENNY_W::GetNumber_of_huawei(){
00090     return _number_of_huawei;
00091 }
00092
00093 void KILKENNY_W::SetNumber_of_sony(int
      _number_of_sony) {
00094     this->_number_of_sony = _number_of_sony;
00095 }
00096
00097 int KILKENNY_W::GetNumber_of_sony(){
00098     return _number_of_sony;
00099 }
00100
00101 void KILKENNY_W::SetNumber_of_samsung(int
      _number_of_samsung) {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
00104
00105 int KILKENNY_W::GetNumber_of_samsung(){
00106     return _number_of_samsung;
00107 }
00108
00109 void KILKENNY_W::SetNumber_of_iphones(int
      _number_of_iphones) {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
00112
00113 int KILKENNY_W::GetNumber_of_iphones(){
00114     return _number_of_iphones;
00115 }
00116
00117 void KILKENNY_W::SetShop_name(std::string _shop_name) {
00118     this->_shop_name = _shop_name;
00119 }
00120
00121 std::string KILKENNY_W::GetShop_name(){
00122     return _shop_name;
```

```
00123 }
00124
00125 void KILKENNY_W::SetShop_address(std::string
      _shop_address) {
00126     this->_shop_address = _shop_address;
00127 }
00128
00129 std::string KILKENNY_W::GetShop_address(){
00130     return _shop_address;
00131 }
00132
```

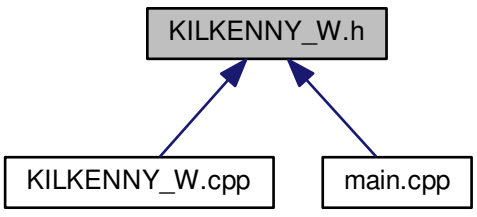
6.31 KILKENNY_W.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for KILKENNY_W.h:



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



Classes

- class KILKENNY_W

6.32 KILKENNY_W.h

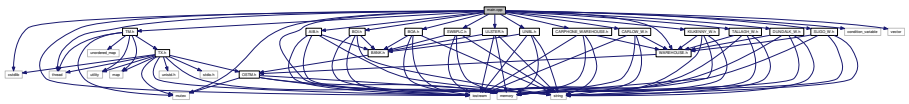
```
00001
00002 /*
00003  * File:   KILKENNY_W.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef KILKENNY_W_H
00011 #define KILKENNY_W_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class KILKENNY_W : public WAREHOUSE {
00020 public:
00024     KILKENNY_W(): WAREHOUSE(){
00025
00026         this->_shop_address = "Kilkenny High Street";
00027         this->_shop_name = "KILKENNY K_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
00038     KILKENNY_W(std::string address, std::string shop_name, int iphone, int samsung, int sony, int
       huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     KILKENNY_W(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     KILKENNY_W(const KILKENNY_W& orig);
00075     KILKENNY_W operator=(const KILKENNY_W& orig){};
00079     virtual ~KILKENNY_W();
00080     /*
00081      * Implement OSTM virtual methods
00082      */
00083     //virtual std::shared_ptr<KILKENNY_W> _cast(std::shared_ptr<OSTM> _object);
00084     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00085     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00086     virtual void toString();
00087     /*
00088      * Implement Warehouse methods
00089      */
00090     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00091     virtual int GetNumber_of_alcatel();
00092     virtual void SetNumber_of_nokia(int _number_of_nokia);
00093     virtual int GetNumber_of_nokia();
00094     virtual void SetNumber_of_huawei(int _number_of_huawei);
00095     virtual int GetNumber_of_huawei();
```

```
00096     virtual void SetNumber_of_sony(int _number_of_sony);
00097     virtual int GetNumber_of_sony();
00098     virtual void SetNumber_of_samsung(int _number_of_samsung);
00099     virtual int GetNumber_of_samsung();
00100     virtual void SetNumber_of_iphones(int _number_of_iphones);
00101     virtual int GetNumber_of_iphones();
00102     virtual void SetShop_name(std::string _shop_name);
00103     virtual std::string GetShop_name();
00104     virtual void SetShop_address(std::string _shop_address);
00105     virtual std::string GetShop_address();
00106
00107
00108 private:
00109     std::string _shop_address;
00110     std::string _shop_name;
00111     int _number_of_iphones;
00112     int _number_of_samsung;
00113     int _number_of_sony;
00114     int _number_of_huawei;
00115     int _number_of_nokia;
00116     int _number_of_alcatel;
00117
00118 };
00119
00120 #endif /* KILKENNY_W_H */
00121
```

6.33 main.cpp File Reference

```
#include <cstdlib>
#include <iostream>
#include <thread>
#include "TM.h"
#include "AIB.h"
#include "BOI.h"
#include "BOA.h"
#include "SWBPLC.h"
#include "ULSTER.h"
#include "UNBL.h"
#include "WAREHOUSE.h"
#include "CARPHONE_WAREHOUSE.h"
#include "CARLOW_W.h"
#include "KILKENNY_W.h"
#include "TALLAGH_W.h"
#include "DUNDALK_W.h"
#include "SLIGO_W.h"
#include <mutex>
#include <memory>
#include <condition_variable>
#include <vector>
```

Include dependency graph for main.cpp:



Functions

- void _complex_transfer_ (std::shared_ptr< OSTM > _from_, std::shared_ptr< OSTM > _from_two_, std::vector< std::shared_ptr< OSTM >> _customer_vec, TM &_tm, double _amount)

complex_transfer function, takes two std::shared_ptr<OSTM> pointer, a vector of std::shared_ptr<OSTM> pointers, the Transaction manager, and the amount to use in the transaction, and transfer the _amount value from booth single objects to the objects to the vector collection

- void _complex_warehouse_transfer_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _to_two, std::shared_ptr< OSTM > _to_three, std::vector< std::shared_ptr< OSTM >> _warehouse_vec, std::shared_ptr< OSTM > _from_, TM &_tm, double _amount)
- void _nested_warehouse_transfer_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _to_two, std::shared_ptr< OSTM > _to_three, std::shared_ptr< OSTM > _from_, TM &_tm, double _amount)

  nested_warehouse_transfer function, takes three std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account
- void _nesting_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _from_, TM &_tm, double _amount)

  nesting function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account This function create nested transactions inside the transaction, and call other function to nesting the transaction as well
- void _six_account_transfer_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _from_one_, std::shared_ptr< OSTM > _from_two_, std::shared_ptr< OSTM > _from_three_, std::shared_ptr< OSTM > _from_four_, std::shared_ptr< OSTM > _from_five_, TM &_tm, double _amount)

  six_account_transfer function, takes six std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from five account to one account
- void _two_account_transfer_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _from_, TM &_tm, double _amount)

  two_account_transfer function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account
- void _warehouse_transfer_ (std::shared_ptr< OSTM > _to_, std::shared_ptr< OSTM > _from_, TM &_tm, double _amount)

  warehouse_transfer function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account
- int main (void)

Variables

- static int vector_number = 600

6.33.1 Function Documentation

6.33.1.1 void _complex_transfer_ (std::shared_ptr< OSTM > *_from_*, std::shared_ptr< OSTM > *_from_two_*, std::vector< std::shared_ptr< OSTM >> *_customer_vec*, TM & *_tm*, double *_amount*)

complex_transfer function, takes two std::shared_ptr<OSTM> pointer, a vector of std::shared_ptr<OSTM> pointers, the Transaction manager, and the amount to use in the transaction, and transfer the _amount value from booth single objects to the objects to the vector collection

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<BANK>	type, *FROM* & *FROM_TWO* & *TO*
std::shared_ptr<OSTM>	type, *FROM_OSTM_ONE* & *FROM_OSTM_TWO* & *TO_OSTM*

Register the two single account

Declare required pointers

Register customers accounts from the collection (vector)

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

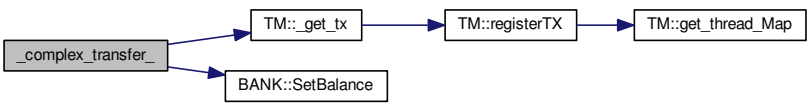
Commit changes

Definition at line 294 of file main.cpp.

References TM::_get_tx(), and BANK::SetBalance().

```
00294                                                   {
00295     std::shared_ptr<TX> tx = _tm._get_tx();
00299     tx->_register(_from_);
00300     tx->_register(_from_two_);
00304     std::shared_ptr<OSTM> _FROM_OSTM_ONE_, _FROM_OSTM_TWO_, _TO_OSTM_;
00305     std::shared_ptr<BANK> _FROM_, _FROM_TWO_, _TO_;
00306
00307     bool done = false;
00308     try {
00309         while (!done) {
00310             // for (int i = 0; i < vector_number; ++i) {
00311             for (auto&& obj : _customer_vec) {
00315                 // auto&& obj = _customer_vec.at(i);
00316                 tx->_register(obj);
00320                 _FROM_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00321                 _FROM_TWO_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_two_));
00322                 _TO_ = std::dynamic_pointer_cast<BANK> (tx->load(obj));
00326                 _FROM_->SetBalance(_FROM_->GetBalance() - _amount);
00327                 _FROM_TWO_->SetBalance(_FROM_TWO_->GetBalance() - _amount);
00328                 _TO_->SetBalance(_TO_->GetBalance() + (_amount * 2));
00332                 _FROM_OSTM_ONE_ = std::dynamic_pointer_cast<OSTM> (_FROM_);
00333                 _FROM_OSTM_TWO_ = std::dynamic_pointer_cast<OSTM> (_FROM_TWO_);
00334                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_);
00338                 tx->store(_FROM_OSTM_ONE_);
00339                 tx->store(_FROM_OSTM_TWO_);
00340                 tx->store(_TO_OSTM_);
00341             }
00345             done = tx->commit();
00346         }
00347     } catch (std::runtime_error& e) {
00348         std::cout << e.what() << std::endl;
00349     }
00350 }
```

Here is the call graph for this function:



6.33.1.2 void _complex_warehouse_transfer_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_to_two*, std::shared_ptr< OSTM > *_to_three*, std::vector< std::shared_ptr< OSTM >> *_warehouse_vec*, std::shared_ptr< OSTM > *_from_*, TM & *_tm*, double *_amount*)

Register the two single account

Declare required pointers

Register customers accounts from the collection (vector)

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<WAREHOUSE> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

NESTED WAREHOUSE TEST _to_two

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

Commit changes

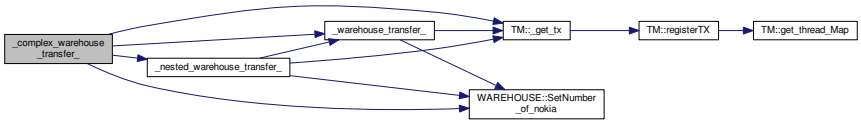
Definition at line 518 of file main.cpp.

References TM::_get_tx(), _nested_warehouse_transfer_(), _warehouse_transfer_(), and WAREHOUSE::Set↩Number_of_nokia().

```
00518
          {
00519     std::shared_ptr<TX> tx = _tm._get_tx();
00523     tx->_register(_to_);
00524     tx->_register(_to_two);
00525     tx->_register(_to_three);
00526     tx->_register(_from_);
00530     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _TO_SHOP_TWO, _TO_SHOP_VEC, _FROM_DIST_;
00531     std::shared_ptr<OSTM> _TO_OSTM_, _TO_OSTM_TWO, _TO_OSTM_VEC, _FROM_OSTM_;
00532
00533     bool done = false;
00534     try {
00535         while (!done) {
00536
00537             // for (int i = 0; i < vector_number; ++i) {
00538             for (auto&& obj : _warehouse_vec) {
00542                 //auto&& obj = _warehouse_vec.at(i);
00543                 tx->_register(obj);
00547                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00548                 _TO_SHOP_TWO = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_two));
00549                 _TO_SHOP_VEC = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(obj));
00550                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00551
00555                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00556                 _TO_SHOP_TWO->SetNumber_of_nokia(_TO_SHOP_TWO->GetNumber_of_nokia() + _amount);
00557                 _TO_SHOP_VEC->SetNumber_of_nokia(_TO_SHOP_VEC->GetNumber_of_nokia() + _amount);
00558                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - (_amount * 3));
00559
00560                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00561                 _TO_SHOP_TWO->SetNumber_of_samsung(_TO_SHOP_TWO->GetNumber_of_samsung() + _amount);
00562                 _TO_SHOP_VEC->SetNumber_of_samsung(_TO_SHOP_VEC->GetNumber_of_samsung() + _amount);
00563                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - (_amount * 3));
00564
00565                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00566                 _TO_SHOP_TWO->SetNumber_of_iphones(_TO_SHOP_TWO->GetNumber_of_iphones() + _amount);
00567                 _TO_SHOP_VEC->SetNumber_of_iphones(_TO_SHOP_VEC->GetNumber_of_iphones() + _amount);
```

```
00568                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - (_amount * 3));
00569
00570                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00571                 _TO_SHOP_TWO->SetNumber_of_sony(_TO_SHOP_TWO->GetNumber_of_sony() + _amount);
00572                 _TO_SHOP_VEC->SetNumber_of_sony(_TO_SHOP_VEC->GetNumber_of_sony() + _amount);
00573                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - (_amount * 3));
00574
00578                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00579                 _TO_OSTM_TWO = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_TWO);
00580                 _TO_OSTM_VEC = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_VEC);
00581                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00585                 tx->store(_TO_OSTM_);
00586                 tx->store(_TO_SHOP_TWO);
00587                 tx->store(_TO_SHOP_VEC);
00588                 tx->store(_FROM_OSTM_);
00589
00590
00591
00592             }
00596             std::shared_ptr<TX> txTwo = _tm._get_tx();
00597             bool nestedDone = false;
00598             while (!nestedDone) {
00599                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_to_two));
00600                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_from_));
00604                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00605                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00606
00607                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00608                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00609
00610                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00611                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00612
00613                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00614                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00618                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00619                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00623                 txTwo->store(_TO_OSTM_);
00624                 txTwo->store(_FROM_OSTM_);
00625
00626                 /*
00627                  * NESTED TRANSACTION TEST _to_three

00628                  */
00629                 _warehouse_transfer_(_to_three, _from_, _tm, _amount);
00630                 _nested_warehouse_transfer_(_to_, _to_two, _to_three, _from_,
      _tm, _amount);
00631
00632                 nestedDone = tx->commit();
00633             }
00634
00638             done = tx->commit();
00639
00640         }
00641     } catch (std::runtime_error& e) {
00642         std::cout << e.what() << std::endl;
00643     }
00644 }
```

Here is the call graph for this function:



6.33.1.3 void _nested_warehouse_transfer_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_to_two*, std::shared_ptr< OSTM > *_to_three*, std::shared_ptr< OSTM > *_from_*, TM & *_tm*, double *_amount*)

nested_warehouse_transfer function, takes three std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<WAREHOUSE>	type, *TO_SHOP* & *FROM_DIST*
std::shared_ptr<OSTM>	type, *TO_OSTM* & *FROM_OSTM*

Register the two single account

Declare required pointers

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

NESTED WAREHOUSE TEST _to_two

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

Commit changes

Definition at line 419 of file main.cpp.

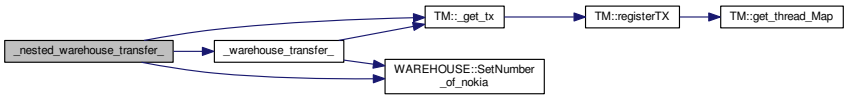
References TM::_get_tx(), _warehouse_transfer_(), and WAREHOUSE::SetNumber_of_nokia().

Referenced by _complex_warehouse_transfer_().

```
00419
                                                                          {
00420     std::shared_ptr<TX> tx = _tm._get_tx();
00424     tx->_register(_to_);
00425     tx->_register(_to_two);
00426     tx->_register(_to_three);
00427     tx->_register(_from_);
00431     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _FROM_DIST_;
00432     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00433
00434     bool done = false;
00435     try {
00436         while (!done) {
00440             _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00441             _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00445             _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00446             _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00447
00448             _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00449             _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00450
00451             _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00452             _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00453
00454             _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00455             _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00459             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00460             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00464             tx->store(_TO_OSTM_);
00465             tx->store(_FROM_OSTM_);
00466
00470             std::shared_ptr<TX> txTwo = _tm._get_tx();
00471             bool nestedDone = false;
00472             while (!nestedDone) {
```

```
00473                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_to_two));
00474                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_from_));
00478                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00479                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00480
00481                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00482                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00483
00484                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00485                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00486
00487                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00488                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00492                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00493                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00497                 txTwo->store(_TO_OSTM_);
00498                 txTwo->store(_FROM_OSTM_);
00499
00500                 /*
00501                  * NESTED TRANSACTION TEST _to_three

00502                  */
00503                 _warehouse_transfer_(_to_three, _from_, _tm, _amount);
00504
00505
00506                 nestedDone = tx->commit();
00507             }
00511             done = tx->commit();
00512         }
00513     } catch (std::runtime_error& e) {
00514         std::cout << e.what() << std::endl;
00515     }
00516 }
```

Here is the call graph for this function:



6.33.1.4 void _nesting_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_from_*, TM & *_tm*, double *_amount*)

nesting function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account This function create nested transactions inside the transaction, and call other function to nesting the transaction as well

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<BANK>	type, *TO_BANK* & *FROM_BANK*
std::shared_ptr<OSTM>	type, *TO_OSTM* & *FROM_OSTM*

Register the two single account

Declare required pointers

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

NESTED TRANSACTION

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

NESTED TRANSACTION IN THE NESTED TRANSACTION *two_account_transfer* function call

Commit changes

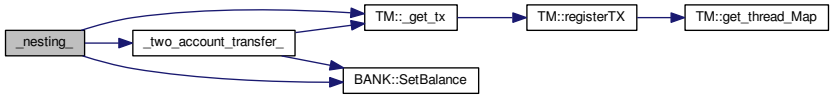
Definition at line 206 of file main.cpp.

References TM::_get_tx(), _two_account_transfer_(), and BANK::SetBalance().

Referenced by main().

```
00206                                                                                                                {
00207     std::shared_ptr<TX> tx = _tm._get_tx();
00211     tx->_register(_to_);
00212     tx->_register(_from_);
00216     std::shared_ptr<BANK> _TO_BANK_, _FROM_BANK_;
00217     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00218
00219
00220     bool done = false;
00221     try {
00222         while (!done) {
00226             _TO_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00227             _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00231             _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00232             _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00236             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00237             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00241             tx->store(_TO_OSTM_);
00242             tx->store(_FROM_OSTM_);
00243
00247             std::shared_ptr<TX> txTwo = _tm._get_tx();
00248
00249             bool nestedDone = false;
00250             while (!nestedDone) {
00251                 _TO_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_to_));
00252                 _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_from_));
00256                 _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00257                 _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00261                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00262                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00266                 txTwo->store(_TO_OSTM_);
00267                 txTwo->store(_FROM_OSTM_);
00272                 _two_account_transfer_(_to_, _from_, _tm, _amount);
00273
00274                 nestedDone = txTwo->commit();
00275             }
00276
00280             done = tx->commit();
00281         }
00282     } catch (std::runtime_error& e) {
00283         std::cout << e.what() << std::endl;
00284     }
00285 }
```

Here is the call graph for this function:



6.33.1.5 void _six_account_transfer_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_from_one_*, std::shared_ptr< OSTM > *_from_two_*, std::shared_ptr< OSTM > *_from_three_*, std::shared_ptr< OSTM > *_from_four_*, std::shared_ptr< OSTM > *_from_five_*, TM & *_tm*, double *_amount*)

six_account_transfer function, takes six std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from five account to one account

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<BANK>	type, *TO* & *FROM_ONE* & *FROM_TWO* & *FROM_THREE* & *FROM_FOUR* & *FROM_FIVE*
std::shared_ptr<OSTM>	type, _TO_OSTM & _FROM_ONE_OSTM & _FROM_TWO_OSTM & _FROM_THREE_OSTM & _FROM_FOUR_OSTM & _FROM_FIVE_OSTM

Register the two single account

Required pointers to use in transaction

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

Commit changes

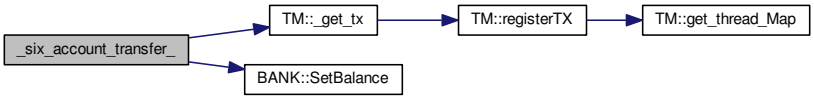
Definition at line 51 of file main.cpp.

References TM::_get_tx(), and BANK::SetBalance().

```
00051
                                  {
00052     std::shared_ptr<TX> tx = _tm._get_tx();
00056     tx->_register(_to_);
00057     tx->_register(_from_one_);
00058     tx->_register(_from_two_);
00059     tx->_register(_from_three_);
00060     tx->_register(_from_four_);
00061     tx->_register(_from_five_);
00062
00066     std::shared_ptr<OSTM> _TO_OSTM, _FROM_ONE_OSTM, _FROM_TWO_OSTM, _FROM_THREE_OSTM, _FROM_FOUR_OSTM,
    _FROM_FIVE_OSTM;
00067     std::shared_ptr<BANK> _TO_, _FROM_ONE_, _FROM_TWO_, _FROM_THREE_, _FROM_FOUR_, _FROM_FIVE_;
00068     try {
00069         bool done = false;
00070         while (!done) {
00074             _TO_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00075             _FROM_ONE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_one_));
00076             _FROM_TWO_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_two_));
00077             _FROM_THREE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_three_));
00078             _FROM_FOUR_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_four_));
00079             _FROM_FIVE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_five_));
00083             _TO_->SetBalance(_TO_->GetBalance() + (_amount * 5));
00084             _FROM_ONE_->SetBalance(_FROM_ONE_->GetBalance() - _amount);
00085             _FROM_TWO_->SetBalance(_FROM_TWO_->GetBalance() - _amount);
00086             _FROM_THREE_->SetBalance(_FROM_THREE_->GetBalance() - _amount);
00087             _FROM_FOUR_->SetBalance(_FROM_FOUR_->GetBalance() - _amount);
00088             _FROM_FIVE_->SetBalance(_FROM_FIVE_->GetBalance() - _amount);
00092             _TO_OSTM = std::dynamic_pointer_cast<OSTM> (_TO_);
00093             _FROM_ONE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_ONE_);
00094             _FROM_TWO_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_TWO_);
00095             _FROM_THREE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_THREE_);
00096             _FROM_FOUR_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_FOUR_);
00097             _FROM_FIVE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_FIVE_);
```

```
00101             tx->store(_TO_OSTM);
00102             tx->store(_FROM_ONE_OSTM);
00103             tx->store(_FROM_TWO_OSTM);
00104             tx->store(_FROM_THREE_OSTM);
00105             tx->store(_FROM_FOUR_OSTM);
00106             tx->store(_FROM_FIVE_OSTM);
00110             done = tx->commit();
00111         }
00112     } catch (std::runtime_error& e) {
00113         std::cout << e.what() << std::endl;
00114     }
00115 }
```

Here is the call graph for this function:



6.33.1.6 void _two_account_transfer_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_from_*, TM & *_tm*, double *_amount*)

two_account_transfer function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<BANK>	type, *TO_BANK* & *FROM_BANK*
std::shared_ptr<OSTM>	type, *TO_OSTM* & *FROM_OSTM*

Register the two single account

Declare required pointers

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

NESTED TRANSACTION

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

Commit changes

Commit changes

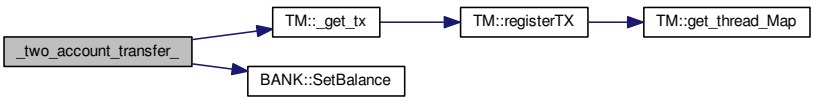
Definition at line 123 of file main.cpp.

References TM::_get_tx(), and BANK::SetBalance().

Referenced by _nesting_().

```
00123
    {
00124     std::shared_ptr<TX> tx = _tm._get_tx();
00128     tx->_register(_to_);
00129     tx->_register(_from_);
00133     std::shared_ptr<BANK> _TO_BANK_, _FROM_BANK_;
00134     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00135
00136     bool done = false;
00137     try {
00138         while (!done) {
00142             _TO_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00143             _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00147             _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00148             _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00152             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00153             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00157             tx->store(_TO_OSTM_);
00158             tx->store(_FROM_OSTM_);
00159
00163             std::shared_ptr<TX> txTwo = _tm._get_tx();
00164
00165             bool nestedDone = false;
00166             while (!nestedDone) {
00167                 _TO_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_to_));
00168                 _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_from_));
00172                 _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00173                 _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00177                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00178                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00182                 txTwo->store(_TO_OSTM_);
00183                 txTwo->store(_FROM_OSTM_);
00187                 nestedDone = txTwo->commit();
00188             }
00192             done = tx->commit();
00193         }
00194     } catch (std::runtime_error& e) {
00195         std::cout << e.what() << std::endl;
00196     }
00197 }
```

Here is the call graph for this function:



6.33.1.7 void _warehouse_transfer_ (std::shared_ptr< OSTM > *_to_*, std::shared_ptr< OSTM > *_from_*, TM & *_tm*, double *_amount*)

warehouse_transfer function, takes two std::shared_ptr<OSTM> pointer, the Transaction manager, and the amount to use in the transaction and transfer the _amount value from one account to the another account

Parameters

std::shared_ptr<TX>	tx, Transaction Object
std::shared_ptr<WAREHOUSE>	type, *TO_SHOP* & *FROM_DIST*
std::shared_ptr<OSTM>	type, *TO_OSTM* & *FROM_OSTM*

Register the two single account

Declare required pointers

From std::shared_ptr<OSTM> to std::shared_ptr<BANK> to access the virtual methods

Make changes with the objects

From std::shared_ptr<BANK> to std::shared_ptr<OSTM> to store the memory spaces

Store changes

Commit changes

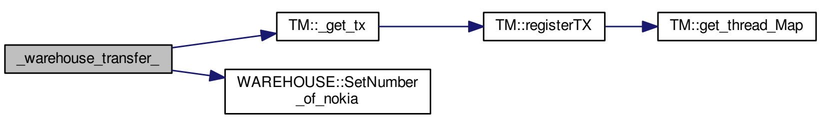
Definition at line 358 of file main.cpp.

References TM::_get_tx(), and WAREHOUSE::SetNumber_of_nokia().

Referenced by _complex_warehouse_transfer_(), and _nested_warehouse_transfer_().

```
00358                                                                                                  {
00359     std::shared_ptr<TX> tx = _tm._get_tx();
00363     tx->_register(_to_);
00364     tx->_register(_from_);
00368     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _FROM_DIST_;
00369     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00370 
00371     bool done = false;
00372     try {
00373         while (!done) {
00377             _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00378             _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00382             _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00383             _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00384 
00385             _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00386             _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00387 
00388             _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00389             _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00390 
00391             _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00392             _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00396             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00397             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00401             tx->store(_TO_OSTM_);
00402             tx->store(_FROM_OSTM_);
00406             done = tx->commit();
00407         }
00408     } catch (std::runtime_error& e) {
00409         std::cout << e.what() << std::endl;
00410     }
00411 }
```

Here is the call graph for this function:



6.33.1.8 int main (void)

main method to run test Get the Transaction Manager
TM& tm = TM::Instance();

Create vector to store std::shared_ptr<OSTM> pointers. All object will have unique ID by default
std::vector<std::shared_ptr<OSTM>> _customer_vec(vector_number);
std::vector<std::shared_ptr<OSTM>> _warehouse_vec(vector_number);

Create objects type of BANK. All object will have unique ID by default
std::shared_ptr<OSTM> aib_ptr = new AIB(100, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");
std::shared_ptr<OSTM> boi_ptr = new BOI(200, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");
std::shared_ptr<OSTM> boa_ptr = new BOA(300, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");
std::shared_ptr<OSTM> swplc_ptr = new SWBPLC(400, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");
std::shared_ptr<OSTM> ulster_ptr = new ULSTER(500, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");
std::shared_ptr<OSTM> unbl_ptr = new UNBL(600, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny");

Create objects type of WAREHOUSE. All object will have unique ID by default
std::shared_ptr<OSTM> w_dist = new CARPHONE_WAREHOUSE();
std::shared_ptr<OSTM> c_shop = new CARLOW_W();
std::shared_ptr<OSTM> k_shop = new KILKENNY_W();
std::shared_ptr<OSTM> t_shop = new TALLAGH_W();
std::shared_ptr<OSTM> d_shop = new DUNDALK_W();
std::shared_ptr<OSTM> s_shop = new SLIGO_W();

Create vector of std::shared_ptr<OSTM> BANK pointers
vector_number is 100 at the moment
for(int i=0;i<vector_number;++i)

Create vector of std::shared_ptr<OSTM> WAREHOUSE pointers
vector_number is 100 at the moment
for(int i=0;i<vector_number;++i)

Display WAREHOUSE objects before transaction
w_dist->toString();
c_shop->toString();
k_shop->toString();
t_shop->toString();
d_shop->toString();
s_shop->toString();

Display BANK objects before transaction
aib_ptr->toString();
boi_ptr->toString();
boa_ptr->toString();
swplc_ptr->toString();
ulster_ptr->toString();
unbl_ptr->toString();

Parameters

transferAmount	in the transaction, control the value in the transaction between objetcs

Parameters

threadArraySize	control number of threads The logic in the IF ELSE statement distribute the threads between three different thread creating option. If the threadArraySize is divisible with three, the threads will be distributed between function. However, you can creates any number of threads, but to follow the correct output should increase the IF ELSE statement to distribute the threads in equal number.

Creating threads^n -> threadArraySize
for (int i = 0; i < threadArraySize; ++i)

TEST 1 : Nested transaction Test
thArray[i] = std::thread(*nesting*, aib_ptr, boi_ptr, std::ref(tm), transferAmount);

TEST 2 :Three different type of function call where the objects are participating in multiple type of transactions
thArray[i] = std::thread(*two_account_transfer*, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
thArray[i] = std::thread(*six_account_transfer*, boi_ptr, boa_ptr, swplc_ptr, ulster_ptr, aib_ptr, unbl_ptr, std::ref(tm), transferAmount)
thArray[i] = std::thread(*complex_transfer*, aib_ptr, boi_ptr, std::ref(_customer_vec), std::ref(tm), transferAmount);

TEST 3 : Testing WAREHOUSE type pointers within transactions
thArray[i] = std::thread(*phone_transfer*, c_shop, w_dist, std::ref(tm), transferAmount);

TEST 4 : Testing WAREHOUSE type pointers within nested transactions
thArray[i] = std::thread(*nested_warehouse_transfer*, c_shop, d_shop, k_shop, w_dist, std::ref(tm), transferAmount);

TEST 5 : Testing WAREHOUSE type pointers within mixed and nested transactions
thArray[i] = std::thread(*warehouse_transfer*, c_shop, w_dist, std::ref(tm), transferAmount);
thArray[i] = std::thread(*nested_warehouse_transfer*, c_shop, d_shop, k_shop, w_dist, std::ref(tm), transferAmount);
thArray[i] = std::thread(*complex_warehouse_transfer*, d_shop, c_shop, std::ref(_warehouse_vec), w_dist, std↩
::ref(tm), transferAmount);

Display objects after all transactions are finished
Uncomment the required corresponding TEST to display results

Extra tx to call and display ROLLBACK value
std::shared_ptr<TX> tx = tm._get_tx();

Display the number of ROLLBACK by all the threads
std::cout << "Rollback counter is : " << tx->getTest_counter() << std::endl;

Display object from vector

Clean up Transaction Manager from all main process associated transactions
tm._TX_EXIT();

Display all Transactions associated with the main process. It should be empty after _TX_EXIT() function call!!!
tm.print_all();

Definition at line 649 of file main.cpp.

References TM::_get_tx(), _nesting_(), TM::_TX_EXIT(), TM::Instance(), TM::print_all(), and vector_number.

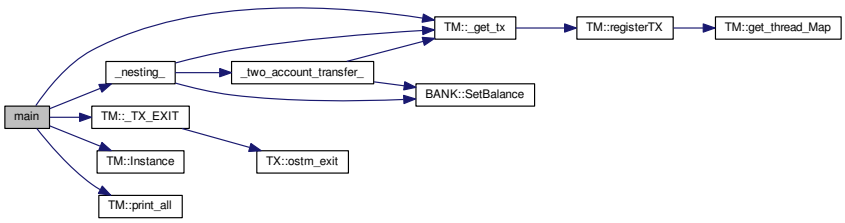
```
00649                {
00654     TM& tm = TM::Instance();
00655
00661
00662     std::vector<std::shared_ptr < OSTM>>_customer_vec; //(vector_number);
00663     std::vector<std::shared_ptr < OSTM>>_warehouse_vec; //(vector_number);
00664
00674     std::shared_ptr<OSTM> aib_ptr(new AIB(100, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00675     std::shared_ptr<OSTM> boi_ptr(new BOI(200, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00676     std::shared_ptr<OSTM> boa_ptr(new BOA(300, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00677     std::shared_ptr<OSTM> swplc_ptr(new SWBPLC(400, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00678     std::shared_ptr<OSTM> ulster_ptr(new ULSTER(500, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00679     std::shared_ptr<OSTM> unbl_ptr(new UNBL(600, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00680
00690
00691     std::shared_ptr<OSTM> w_dist(new CARPHONE_WAREHOUSE());
00692     std::shared_ptr<OSTM> c_shop(new CARLOW_W());
00693     std::shared_ptr<OSTM> k_shop(new KILKENNY_W());
00694     std::shared_ptr<OSTM> t_shop(new TALLAGH_W());
00695     std::shared_ptr<OSTM> d_shop(new DUNDALK_W());
00696     std::shared_ptr<OSTM> s_shop(new SLIGO_W());
00697
00703     for (int i = 0; i < vector_number; ++i) {
00704         if (i % 5 == 0) {
00705             std::shared_ptr<OSTM> sharedptr(new CARLOW_W());
00706             _warehouse_vec.push_back(std::move(sharedptr));
00707         } else if (i % 4 == 0) {
00708             std::shared_ptr<OSTM> sharedptr(new KILKENNY_W());
00709             _warehouse_vec.push_back(std::move(sharedptr));
00710         } else if (i % 3 == 0) {
00711             std::shared_ptr<OSTM> sharedptr(new TALLAGH_W());
00712             _warehouse_vec.push_back(std::move(sharedptr));
00713         } else if (i % 2 == 0) {
00714             std::shared_ptr<OSTM> sharedptr(new DUNDALK_W());
00715             _warehouse_vec.push_back(std::move(sharedptr));
00716         } else if (i % 1 == 0) {
00717             std::shared_ptr<OSTM> sharedptr(new SLIGO_W());
00718             _warehouse_vec.push_back(std::move(sharedptr));
00719         }
00720     }
00721
00727     for (int i = 0; i < vector_number; ++i) {
00728         if (i % 6 == 0) {
00729             std::shared_ptr<OSTM> sharedptr(new AIB(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00730             _customer_vec.push_back(std::move(sharedptr));
00731         } else if (i % 5 == 0) {
00732             std::shared_ptr<OSTM> sharedptr(new BOI(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00733             _customer_vec.push_back(std::move(sharedptr));
00734         } else if (i % 4 == 0) {
00735             std::shared_ptr<OSTM> sharedptr(new BOA(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00736             _customer_vec.push_back(std::move(sharedptr));
00737         } else if (i % 3 == 0) {
00738             std::shared_ptr<OSTM> sharedptr(new SWBPLC(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00739             _customer_vec.push_back(std::move(sharedptr));
00740         } else if (i % 2 == 0) {
00741             std::shared_ptr<OSTM> sharedptr(new ULSTER(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00742             _customer_vec.push_back(std::move(sharedptr));
00743         } else if (i % 1 == 0) {
00744             std::shared_ptr<OSTM> sharedptr(new UNBL(i, 50, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00745             _customer_vec.push_back(std::move(sharedptr));
00746         }
00747     }
00748
00758     //    w_dist->toString();
00759     //    c_shop->toString();
00760     //    k_shop->toString();
00761     //    t_shop->toString();
00762     //    d_shop->toString();
00763     //    s_shop->toString();
00764
00774
00775     /*
00776      * TEST 1 : object requirements

00777      */
```

```
00778     aib_ptr->toString();
00779     boi_ptr->toString();
00780
00781     /*
00782      * TEST 2 : object requirements

00783      */
00784     //    aib_ptr->toString();
00785     //    boi_ptr->toString();
00786     //    boa_ptr->toString();
00787     //    swplc_ptr->toString();
00788     //    ulster_ptr->toString();
00789     //    unbl_ptr->toString();
00790     //    for(int i=0; i<vector_number; ++i){
00791     //        _customer_vec[i]->toString();
00792     //    }
00793
00794     /*
00795      * TEST 3 : object requirements

00796      */
00797     //    w_dist->toString();
00798     //    c_shop->toString();
00799     //    k_shop->toString();
00800     //    t_shop->toString();
00801
00802     /*
00803      * TEST 4 : objects requirements

00804      */
00805     //        w_dist->toString();
00806     //        c_shop->toString();
00807     //        k_shop->toString();
00808     //        t_shop->toString();
00809     //        d_shop->toString();
00810     //        s_shop->toString();
00811
00812
00813     /*
00814      * TEST 5 : objects requirements

00815      */
00816     //        w_dist->toString();
00817     //        c_shop->toString();
00818     //        k_shop->toString();
00819     //        t_shop->toString();
00820     //        d_shop->toString();
00821     //        s_shop->toString();
00822
00823     //        for(auto&& elem: _warehouse_vec){
00824     //            elem->toString(); // virtual dispatch
00825     //
00826     //        }
00827
00828
00829
00833     int transferAmount = 1;
00840     int threadArraySize = 99;
00841     std::thread thArray[threadArraySize];
00842
00847     for (int i = 0; i < threadArraySize; ++i) {
00848
00853         if (i % 3 == 0)
00854             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00855         else if (i % 2 == 0)
00856             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00857         else if (i % 1 == 0)
00858             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00859
00866         //    if (i % 3 == 0)
00867         //        thArray[i] = std::thread(_two_account_transfer_, aib_ptr, boi_ptr, std::ref(tm),
      transferAmount);
00868         //    else if (i % 2 == 0)
00869         //        thArray[i] = std::thread(_six_account_transfer_, boi_ptr, boa_ptr, swplc_ptr, ulster_ptr,
      aib_ptr, unbl_ptr, std::ref(tm), transferAmount);
00870         //    else if (i % 1 == 0)
00871         //        thArray[i] = std::thread(_complex_transfer_, aib_ptr, boi_ptr, std::ref(_customer_vec),
      std::ref(tm), transferAmount);
00872
00873
00878         //        if (i % 3 == 0)
00879         //            thArray[i] = std::thread(_warehouse_transfer_, c_shop, w_dist, std::ref(tm),
      transferAmount);
00880         //        else if (i % 2 == 0)
00881         //            thArray[i] = std::thread(_warehouse_transfer_, k_shop, w_dist, std::ref(tm),
      transferAmount);
00882         //        else if (i % 1 == 0)
```

```
00883         //            thArray[i] = std::thread(_warehouse_transfer_, t_shop, w_dist, std::ref(tm),
      transferAmount);
00884
00889         //        if (i % 3 == 0)
00890         //            thArray[i] = std::thread(_nested_warehouse_transfer_, c_shop, d_shop, k_shop, w_dist,
      std::ref(tm), transferAmount);
00891         //        else if (i % 2 == 0)
00892         //            thArray[i] = std::thread(_nested_warehouse_transfer_, k_shop, s_shop, t_shop, w_dist,
      std::ref(tm), transferAmount);
00893         //        else if (i % 1 == 0)
00894         //            thArray[i] = std::thread(_nested_warehouse_transfer_, t_shop, c_shop, s_shop, w_dist,
      std::ref(tm), transferAmount);
00895
00903
00904         //        if (i % 3 == 0)
00905         //            thArray[i] = std::thread(_warehouse_transfer_, c_shop, w_dist, std::ref(tm),
      transferAmount);
00906         //        else if (i % 2 == 0)
00907         //            thArray[i] = std::thread(_nested_warehouse_transfer_, k_shop, s_shop, t_shop, w_dist,
      std::ref(tm), transferAmount);
00908         //        else if (i % 1 == 0)
00909         //            thArray[i] = std::thread(_complex_warehouse_transfer_, d_shop, s_shop, c_shop,
      std::ref(_warehouse_vec), w_dist, std::ref(tm), transferAmount);
00910
00911
00912     }
00913     /*
00914      * Join threads^n -> threadArraySize<br>

00915      * thArray[i].join();

00916      */
00917     for (int i = 0; i < threadArraySize; ++i) {
00918         thArray[i].join();
00919     }
00920
00921
00922     std::cout << "\nMain process print " << std::endl;
00927
00928     /*
00929      * TEST 1 : object requirements

00930      */
00931     aib_ptr->toString();
00932     boi_ptr->toString();
00933
00934     /*
00935      * TEST 2 : object requirements

00936      */
00937     //    aib_ptr->toString();
00938     //    boi_ptr->toString();
00939     //    boa_ptr->toString();
00940     //    swplc_ptr->toString();
00941     //    ulster_ptr->toString();
00942     //    unbl_ptr->toString();
00943     //    for(int i=0; i<vector_number; ++i){
00944     //        _customer_vec[i]->toString();
00945     //    }
00946
00947     /*
00948      * TEST 3 : object requirements

00949      */
00950     //            w_dist->toString();
00951     //            c_shop->toString();
00952     //            k_shop->toString();
00953     //            t_shop->toString();
00954
00955     /*
00956      * TEST 4 : objects requirements

00957      */
00958     //        w_dist->toString();
00959     //        c_shop->toString();
00960     //        k_shop->toString();
00961     //        t_shop->toString();
00962     //        d_shop->toString();
00963     //        s_shop->toString();
00964
00965     /*
00966      * TEST 5 : objects requirements

00967      */
00968     //        w_dist->toString();
00969     //        c_shop->toString();
00970     //        k_shop->toString();
```

```
00971     //        t_shop->toString();
00972     //        d_shop->toString();
00973     //        s_shop->toString();
00974
00975     //        for(auto&& elem: _warehouse_vec){
00976     //            elem->toString(); // virtual dispatch
00977     //
00978     //        }
00979
00980     /* TEST 5 FINISH */
00981
00982
00983     std::cout << "\nMAIN PROCESS EXIT !!!! " << std::endl;
00988     std::shared_ptr<TX> tx = tm._get_tx();
00989
00994     std::cout << "Rollback counter is : " << tx->getTest_counter() << std::endl;
00998     //    std::cout << "[vector_number]" << std::endl;
00999     //    for (int i = 0; i < vector_number; ++i) {
01000     //        //_customer_vec[i]->toString();
01001     //        auto&& os = _customer_vec.at(i);
01002     //        os->toString();
01003     //    }
01004     //    std::cout << "[_warehouse_vec]" << std::endl;
01005     //    for(auto&& elem: _warehouse_vec){
01006     //        elem->toString(); // virtual dispatch
01007     //
01008     //    }
01009     //_customer_vec[10]->toString();
01010
01015     tm._TX_EXIT();
01016     std::cout << "\nPRINT ALL FROM TM !!!! SHOULD BE EMPTY AFTER _TX_EXIT() !!" << std::endl;
01021     tm.print_all();
01022
01023     return 0;
01024 }
```

Here is the call graph for this function:



6.33.2 Variable Documentation

6.33.2.1 int vector_number = 600 [static]

Parameters

vector_number	control the size of the vector to store std::shared_ptr<OSTM> pointer

Definition at line 43 of file main.cpp.

Referenced by main().

6.34 main.cpp

```
00001 /*
```

```
00002  * To change this license header, choose License Headers in Project Properties.
00003  * To change this template file, choose Tools | Templates
00004  * and open the template in the editor.
00005  */
00006
00007 /*
00008  * File:   main.cpp
00009  * Author: zoltan
00010  *
00011  * Created on November 27, 2017, 9:26 PM
00012  */
00013
00014 #include <cstdlib>
00015 #include <iostream>
00016 #include <thread>
00017 //#include <unistd.h>//used for pid_t
00018
00019 //STM library requirement
00020 #include "TM.h"
00021 #include "AIB.h"     //Bank Account
00022 #include "BOI.h"     //Bank Account
00023 #include "BOA.h"     //Bank Account
00024 #include "SWBPLC.h" //Bank Account
00025 #include "ULSTER.h" //Bank Account
00026 #include "UNBL.h"    //Bank Account
00027 #include "WAREHOUSE.h"    //WAREHOUSE
00028 #include "CARPHONE_WAREHOUSE.h" //WAREHOUSE
00029 #include "CARLOW_W.h"     //WAREHOUSE
00030 #include "KILKENNY_W.h"  //WAREHOUSE
00031 #include "TALLAGH_W.h"    //WAREHOUSE
00032 #include "DUNDALK_W.h"    //WAREHOUSE
00033 #include "SLIGO_W.h"      //WAREHOUSE
00034 #include <mutex>
00035 #include <memory>
00036 #include <condition_variable>
00037 #include <vector>
00038
00039
00043 static int vector_number = 600;
00044
00051 void _six_account_transfer_(std::shared_ptr<OSTM> _to_, std::shared_ptr<OSTM>
      _from_one_, std::shared_ptr<OSTM> _from_two_, std::shared_ptr<OSTM> _from_three_, std::shared_ptr<OSTM> _from_four_
      , std::shared_ptr<OSTM> _from_five_, TM& _tm, double _amount) {
00052     std::shared_ptr<TX> tx = _tm._get_tx();
00056     tx->_register(_to_);
00057     tx->_register(_from_one_);
00058     tx->_register(_from_two_);
00059     tx->_register(_from_three_);
00060     tx->_register(_from_four_);
00061     tx->_register(_from_five_);
00062
00066     std::shared_ptr<OSTM> _TO_OSTM, _FROM_ONE_OSTM, _FROM_TWO_OSTM, _FROM_THREE_OSTM, _FROM_FOUR_OSTM,
      _FROM_FIVE_OSTM;
00067     std::shared_ptr<BANK> _TO_, _FROM_ONE_, _FROM_TWO_, _FROM_THREE_, _FROM_FOUR_, _FROM_FIVE_;
00068     try {
00069         bool done = false;
00070         while (!done) {
00074             _TO_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00075             _FROM_ONE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_one_));
00076             _FROM_TWO_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_two_));
00077             _FROM_THREE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_three_));
00078             _FROM_FOUR_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_four_));
00079             _FROM_FIVE_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_five_));
00083             _TO_->SetBalance(_TO_->GetBalance() + (_amount * 5));
00084             _FROM_ONE_->SetBalance(_FROM_ONE_->GetBalance() - _amount);
00085             _FROM_TWO_->SetBalance(_FROM_TWO_->GetBalance() - _amount);
00086             _FROM_THREE_->SetBalance(_FROM_THREE_->GetBalance() - _amount);
00087             _FROM_FOUR_->SetBalance(_FROM_FOUR_->GetBalance() - _amount);
00088             _FROM_FIVE_->SetBalance(_FROM_FIVE_->GetBalance() - _amount);
00092             _TO_OSTM = std::dynamic_pointer_cast<OSTM> (_TO_);
00093             _FROM_ONE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_ONE_);
00094             _FROM_TWO_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_TWO_);
00095             _FROM_THREE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_THREE_);
00096             _FROM_FOUR_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_FOUR_);
00097             _FROM_FIVE_OSTM = std::dynamic_pointer_cast<OSTM> (_FROM_FIVE_);
00101             tx->store(_TO_OSTM);
00102             tx->store(_FROM_ONE_OSTM);
00103             tx->store(_FROM_TWO_OSTM);
00104             tx->store(_FROM_THREE_OSTM);
00105             tx->store(_FROM_FOUR_OSTM);
00106             tx->store(_FROM_FIVE_OSTM);
00110             done = tx->commit();
00111         }
00112     } catch (std::runtime_error& e) {
00113         std::cout << e.what() << std::endl;
00114     }
00115 }
```

```
00116
00123 void _two_account_transfer_(std::shared_ptr<OSTM> _to_, std::shared_ptr<OSTM> _from_,
       TM& _tm, double _amount) {
00124     std::shared_ptr<TX> tx = _tm._get_tx();
00128     tx->_register(_to_);
00129     tx->_register(_from_);
00133     std::shared_ptr<BANK> _TO_BANK_, _FROM_BANK_;
00134     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00135
00136     bool done = false;
00137     try {
00138         while (!done) {
00142             _TO_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00143             _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00147             _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00148             _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00152             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00153             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00157             tx->store(_TO_OSTM_);
00158             tx->store(_FROM_OSTM_);
00159
00163             std::shared_ptr<TX> txTwo = _tm._get_tx();
00164
00165             bool nestedDone = false;
00166             while (!nestedDone) {
00167                 _TO_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_to_));
00168                 _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_from_));
00172                 _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00173                 _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00177                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00178                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00182                 txTwo->store(_TO_OSTM_);
00183                 txTwo->store(_FROM_OSTM_);
00187                 nestedDone = txTwo->commit();
00188             }
00192             done = tx->commit();
00193         }
00194     } catch (std::runtime_error& e) {
00195         std::cout << e.what() << std::endl;
00196     }
00197 }
00198
00206 void _nesting_(std::shared_ptr<OSTM> _to_, std::shared_ptr<OSTM> _from_,
      TM& _tm, double _amount) {
00207     std::shared_ptr<TX> tx = _tm._get_tx();
00211     tx->_register(_to_);
00212     tx->_register(_from_);
00216     std::shared_ptr<BANK> _TO_BANK_, _FROM_BANK_;
00217     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00218
00219
00220     bool done = false;
00221     try {
00222         while (!done) {
00226             _TO_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_to_));
00227             _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00231             _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00232             _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00236             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00237             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00241             tx->store(_TO_OSTM_);
00242             tx->store(_FROM_OSTM_);
00243
00247             std::shared_ptr<TX> txTwo = _tm._get_tx();
00248
00249             bool nestedDone = false;
00250             while (!nestedDone) {
00251                 _TO_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_to_));
00252                 _FROM_BANK_ = std::dynamic_pointer_cast<BANK> (txTwo->load(_from_));
00256                 _TO_BANK_->SetBalance(_TO_BANK_->GetBalance() + _amount);
00257                 _FROM_BANK_->SetBalance(_FROM_BANK_->GetBalance() - _amount);
00261                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_BANK_);
00262                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_BANK_);
00266                 txTwo->store(_TO_OSTM_);
00267                 txTwo->store(_FROM_OSTM_);
00272                 _two_account_transfer_(_to_, _from_, _tm, _amount);
00273
00274                 nestedDone = txTwo->commit();
00275             }
00276
00280             done = tx->commit();
00281         }
00282     } catch (std::runtime_error& e) {
00283         std::cout << e.what() << std::endl;
00284     }
00285 }
00286
```

```
00294 void _complex_transfer_(std::shared_ptr<OSTM> _from_, std::shared_ptr<OSTM> _from_two_,
      std::vector<std::shared_ptr<OSTM>> _customer_vec, TM& _tm, double _amount) {
00295     std::shared_ptr<TX> tx = _tm._get_tx();
00299     tx->_register(_from_);
00300     tx->_register(_from_two_);
00304     std::shared_ptr<OSTM> _FROM_OSTM_ONE_, _FROM_OSTM_TWO_, _TO_OSTM_;
00305     std::shared_ptr<BANK> _FROM_, _FROM_TWO_, _TO_;
00306
00307     bool done = false;
00308     try {
00309         while (!done) {
00310             // for (int i = 0; i < vector_number; ++i) {
00311             for (auto&& obj : _customer_vec) {
00315                 // auto&& obj = _customer_vec.at(i);
00316                 tx->_register(obj);
00320                 _FROM_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_));
00321                 _FROM_TWO_ = std::dynamic_pointer_cast<BANK> (tx->load(_from_two_));
00322                 _TO_ = std::dynamic_pointer_cast<BANK> (tx->load(obj));
00326                 _FROM_->SetBalance(_FROM_->GetBalance() - _amount);
00327                 _FROM_TWO_->SetBalance(_FROM_TWO_->GetBalance() - _amount);
00328                 _TO_->SetBalance(_TO_->GetBalance() + (_amount * 2));
00332                 _FROM_OSTM_ONE_ = std::dynamic_pointer_cast<OSTM> (_FROM_);
00333                 _FROM_OSTM_TWO_ = std::dynamic_pointer_cast<OSTM> (_FROM_TWO_);
00334                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_);
00338                 tx->store(_FROM_OSTM_ONE_);
00339                 tx->store(_FROM_OSTM_TWO_);
00340                 tx->store(_TO_OSTM_);
00341             }
00345             done = tx->commit();
00346         }
00347     } catch (std::runtime_error& e) {
00348         std::cout << e.what() << std::endl;
00349     }
00350 }
00351
00358 void _warehouse_transfer_(std::shared_ptr<OSTM> _to_, std::shared_ptr<OSTM> _from_,
      TM& _tm, double _amount) {
00359     std::shared_ptr<TX> tx = _tm._get_tx();
00363     tx->_register(_to_);
00364     tx->_register(_from_);
00368     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _FROM_DIST_;
00369     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00370
00371     bool done = false;
00372     try {
00373         while (!done) {
00377             _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00378             _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00382             _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00383             _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00384
00385             _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00386             _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00387
00388             _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00389             _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00390
00391             _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00392             _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00396             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00397             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00401             tx->store(_TO_OSTM_);
00402             tx->store(_FROM_OSTM_);
00406             done = tx->commit();
00407         }
00408     } catch (std::runtime_error& e) {
00409         std::cout << e.what() << std::endl;
00410     }
00411 }
00412
00419 void _nested_warehouse_transfer_(std::shared_ptr<OSTM> _to_,
      std::shared_ptr<OSTM> _to_two, std::shared_ptr<OSTM> _to_three, std::shared_ptr<OSTM> _from_, TM& _tm, double _amount)
00420     std::shared_ptr<TX> tx = _tm._get_tx();
00424     tx->_register(_to_);
00425     tx->_register(_to_two);
00426     tx->_register(_to_three);
00427     tx->_register(_from_);
00431     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _FROM_DIST_;
00432     std::shared_ptr<OSTM> _TO_OSTM_, _FROM_OSTM_;
00433
00434     bool done = false;
00435     try {
00436         while (!done) {
00440             _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00441             _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00445             _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00446             _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
```

```
00447
00448             _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00449             _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00450
00451             _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00452             _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00453
00454             _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00455             _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00459             _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00460             _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00464             tx->store(_TO_OSTM_);
00465             tx->store(_FROM_OSTM_);
00466
00470             std::shared_ptr<TX> txTwo = _tm._get_tx();
00471             bool nestedDone = false;
00472             while (!nestedDone) {
00473                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_to_two));
00474                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_from_));
00478                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00479                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00480
00481                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00482                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00483
00484                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00485                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00486
00487                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00488                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00492                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00493                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00497                 txTwo->store(_TO_OSTM_);
00498                 txTwo->store(_FROM_OSTM_);
00499
00500                 /*
00501                  * NESTED TRANSACTION TEST _to_three
00502                  */
00503                 _warehouse_transfer_(_to_three, _from_, _tm, _amount);
00504
00505
00506                 nestedDone = tx->commit();
00507             }
00511             done = tx->commit();
00512         }
00513     } catch (std::runtime_error& e) {
00514         std::cout << e.what() << std::endl;
00515     }
00516 }
00517
00518 void _complex_warehouse_transfer_(std::shared_ptr<OSTM> _to_,
      std::shared_ptr<OSTM> _to_two, std::shared_ptr<OSTM> _to_three, std::vector<std::shared_ptr<OSTM>> _warehouse_vec,
      std::shared_ptr<OSTM> _from_, TM& _tm, double _amount) {
00519     std::shared_ptr<TX> tx = _tm._get_tx();
00523     tx->_register(_to_);
00524     tx->_register(_to_two);
00525     tx->_register(_to_three);
00526     tx->_register(_from_);
00530     std::shared_ptr<WAREHOUSE> _TO_SHOP_, _TO_SHOP_TWO, _TO_SHOP_VEC, _FROM_DIST_;
00531     std::shared_ptr<OSTM> _TO_OSTM_, _TO_OSTM_TWO, _TO_OSTM_VEC, _FROM_OSTM_;
00532
00533     bool done = false;
00534     try {
00535         while (!done) {
00536
00537             // for (int i = 0; i < vector_number; ++i) {
00538             for (auto&& obj : _warehouse_vec) {
00542                 //auto&& obj = _warehouse_vec.at(i);
00543                 tx->_register(obj);
00547                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_));
00548                 _TO_SHOP_TWO = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_to_two));
00549                 _TO_SHOP_VEC = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(obj));
00550                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (tx->load(_from_));
00551
00555                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00556                 _TO_SHOP_TWO->SetNumber_of_nokia(_TO_SHOP_TWO->GetNumber_of_nokia() + _amount);
00557                 _TO_SHOP_VEC->SetNumber_of_nokia(_TO_SHOP_VEC->GetNumber_of_nokia() + _amount);
00558                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - (_amount * 3));
00559
00560                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00561                 _TO_SHOP_TWO->SetNumber_of_samsung(_TO_SHOP_TWO->GetNumber_of_samsung() + _amount);
00562                 _TO_SHOP_VEC->SetNumber_of_samsung(_TO_SHOP_VEC->GetNumber_of_samsung() + _amount);
00563                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - (_amount * 3));
00564
00565                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00566                 _TO_SHOP_TWO->SetNumber_of_iphones(_TO_SHOP_TWO->GetNumber_of_iphones() + _amount);
00567                 _TO_SHOP_VEC->SetNumber_of_iphones(_TO_SHOP_VEC->GetNumber_of_iphones() + _amount);
```

```
00568                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - (_amount * 3));
00569
00570                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00571                 _TO_SHOP_TWO->SetNumber_of_sony(_TO_SHOP_TWO->GetNumber_of_sony() + _amount);
00572                 _TO_SHOP_VEC->SetNumber_of_sony(_TO_SHOP_VEC->GetNumber_of_sony() + _amount);
00573                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - (_amount * 3));
00574
00578                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00579                 _TO_OSTM_TWO = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_TWO);
00580                 _TO_OSTM_VEC = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_VEC);
00581                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00585                 tx->store(_TO_OSTM_);
00586                 tx->store(_TO_SHOP_TWO);
00587                 tx->store(_TO_SHOP_VEC);
00588                 tx->store(_FROM_OSTM_);
00589
00590
00591
00592             }
00596             std::shared_ptr<TX> txTwo = _tm._get_tx();
00597             bool nestedDone = false;
00598             while (!nestedDone) {
00599                 _TO_SHOP_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_to_two));
00600                 _FROM_DIST_ = std::dynamic_pointer_cast<WAREHOUSE> (txTwo->load(_from_));
00604                 _TO_SHOP_->SetNumber_of_nokia(_TO_SHOP_->GetNumber_of_nokia() + _amount);
00605                 _FROM_DIST_->SetNumber_of_nokia(_FROM_DIST_->GetNumber_of_nokia() - _amount);
00606
00607                 _TO_SHOP_->SetNumber_of_samsung(_TO_SHOP_->GetNumber_of_samsung() + _amount);
00608                 _FROM_DIST_->SetNumber_of_samsung(_FROM_DIST_->GetNumber_of_samsung() - _amount);
00609
00610                 _TO_SHOP_->SetNumber_of_iphones(_TO_SHOP_->GetNumber_of_iphones() + _amount);
00611                 _FROM_DIST_->SetNumber_of_iphones(_FROM_DIST_->GetNumber_of_iphones() - _amount);
00612
00613                 _TO_SHOP_->SetNumber_of_sony(_TO_SHOP_->GetNumber_of_sony() + _amount);
00614                 _FROM_DIST_->SetNumber_of_sony(_FROM_DIST_->GetNumber_of_sony() - _amount);
00618                 _TO_OSTM_ = std::dynamic_pointer_cast<OSTM> (_TO_SHOP_);
00619                 _FROM_OSTM_ = std::dynamic_pointer_cast<OSTM> (_FROM_DIST_);
00623                 txTwo->store(_TO_OSTM_);
00624                 txTwo->store(_FROM_OSTM_);
00625
00626                 /*
00627                  * NESTED TRANSACTION TEST _to_three
00628                  */
00629                 _warehouse_transfer_(_to_three, _from_, _tm, _amount);
00630                 _nested_warehouse_transfer_(_to_, _to_two, _to_three, _from_,
      _tm, _amount);
00631
00632                 nestedDone = tx->commit();
00633             }
00634
00638             done = tx->commit();
00639
00640         }
00641     } catch (std::runtime_error& e) {
00642         std::cout << e.what() << std::endl;
00643     }
00644 }
00645
00649 int main(void) {
00654     TM& tm = TM::Instance();
00655
00662     std::vector<std::shared_ptr < OSTM>>_customer_vec; //(vector_number);
00663     std::vector<std::shared_ptr < OSTM>>_warehouse_vec; //(vector_number);
00664
00674     std::shared_ptr<OSTM> aib_ptr(new AIB(100, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00675     std::shared_ptr<OSTM> boi_ptr(new BOI(200, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00676     std::shared_ptr<OSTM> boa_ptr(new BOA(300, 500, "Joe", "Blog", "High street, Kilkenny, Co.Kilkenny")
      );
00677     std::shared_ptr<OSTM> swplc_ptr(new SWBPLC(400, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00678     std::shared_ptr<OSTM> ulster_ptr(new ULSTER(500, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00679     std::shared_ptr<OSTM> unbl_ptr(new UNBL(600, 500, "Joe", "Blog", "High street, Kilkenny,
       Co.Kilkenny"));
00680
00691     std::shared_ptr<OSTM> w_dist(new CARPHONE_WAREHOUSE());
00692     std::shared_ptr<OSTM> c_shop(new CARLOW_W());
00693     std::shared_ptr<OSTM> k_shop(new KILKENNY_W());
00694     std::shared_ptr<OSTM> t_shop(new TALLAGH_W());
00695     std::shared_ptr<OSTM> d_shop(new DUNDALK_W());
00696     std::shared_ptr<OSTM> s_shop(new SLIGO_W());
00697
00703     for (int i = 0; i < vector_number; ++i) {
00704         if (i % 5 == 0) {
00705             std::shared_ptr<OSTM> sharedptr(new CARLOW_W());
```

```
00706             _warehouse_vec.push_back(std::move(sharedptr));
00707         } else if (i % 4 == 0) {
00708             std::shared_ptr<OSTM> sharedptr(new KILKENNY_W());
00709             _warehouse_vec.push_back(std::move(sharedptr));
00710         } else if (i % 3 == 0) {
00711             std::shared_ptr<OSTM> sharedptr(new TALLAGH_W());
00712             _warehouse_vec.push_back(std::move(sharedptr));
00713         } else if (i % 2 == 0) {
00714             std::shared_ptr<OSTM> sharedptr(new DUNDALK_W());
00715             _warehouse_vec.push_back(std::move(sharedptr));
00716         } else if (i % 1 == 0) {
00717             std::shared_ptr<OSTM> sharedptr(new SLIGO_W());
00718             _warehouse_vec.push_back(std::move(sharedptr));
00719         }
00720     }
00721
00727     for (int i = 0; i < vector_number; ++i) {
00728         if (i % 6 == 0) {
00729             std::shared_ptr<OSTM> sharedptr(new AIB(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00730             _customer_vec.push_back(std::move(sharedptr));
00731         } else if (i % 5 == 0) {
00732             std::shared_ptr<OSTM> sharedptr(new BOI(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00733             _customer_vec.push_back(std::move(sharedptr));
00734         } else if (i % 4 == 0) {
00735             std::shared_ptr<OSTM> sharedptr(new BOA(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00736             _customer_vec.push_back(std::move(sharedptr));
00737         } else if (i % 3 == 0) {
00738             std::shared_ptr<OSTM> sharedptr(new SWBPLC(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00739             _customer_vec.push_back(std::move(sharedptr));
00740         } else if (i % 2 == 0) {
00741             std::shared_ptr<OSTM> sharedptr(new ULSTER(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00742             _customer_vec.push_back(std::move(sharedptr));
00743         } else if (i % 1 == 0) {
00744             std::shared_ptr<OSTM> sharedptr(new UNBL(i, 50, "Joe", "Blog", "High street, Kilkenny,
    Co.Kilkenny"));
00745             _customer_vec.push_back(std::move(sharedptr));
00746         }
00747     }
00748
00758     //    w_dist->toString();
00759     //    c_shop->toString();
00760     //    k_shop->toString();
00761     //    t_shop->toString();
00762     //    d_shop->toString();
00763     //    s_shop->toString();
00764
00775     /*
00776      * TEST 1 : object requirements
00777      */
00778     aib_ptr->toString();
00779     boi_ptr->toString();
00780
00781     /*
00782      * TEST 2 : object requirements
00783      */
00784     //    aib_ptr->toString();
00785     //    boi_ptr->toString();
00786     //    boa_ptr->toString();
00787     //    swplc_ptr->toString();
00788     //    ulster_ptr->toString();
00789     //    unbl_ptr->toString();
00790     //    for(int i=0; i<vector_number; ++i){
00791     //        _customer_vec[i]->toString();
00792     //    }
00793
00794     /*
00795      * TEST 3 : object requirements
00796      */
00797     //    w_dist->toString();
00798     //    c_shop->toString();
00799     //    k_shop->toString();
00800     //    t_shop->toString();
00801
00802     /*
00803      * TEST 4 : objects requirements
00804      */
00805     //        w_dist->toString();
00806     //        c_shop->toString();
00807     //        k_shop->toString();
00808     //        t_shop->toString();
00809     //        d_shop->toString();
00810     //        s_shop->toString();
```

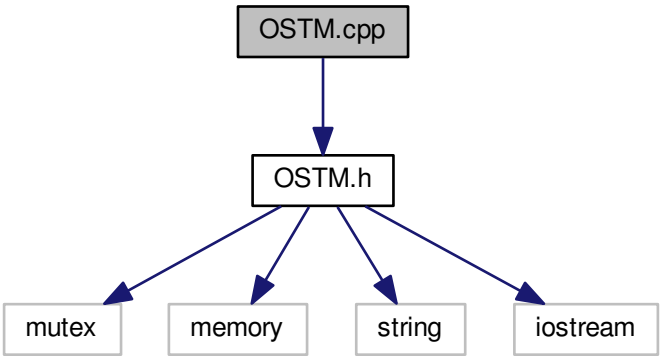
```
00811
00812
00813     /*
00814      * TEST 5 : objects requirements
00815      */
00816     //        w_dist->toString();
00817     //        c_shop->toString();
00818     //        k_shop->toString();
00819     //        t_shop->toString();
00820     //        d_shop->toString();
00821     //        s_shop->toString();
00822
00823     //        for(auto&& elem: _warehouse_vec){
00824     //            elem->toString(); // virtual dispatch
00825     //
00826     //        }
00827
00828
00829
00833     int transferAmount = 1;
00840     int threadArraySize = 99;
00841     std::thread thArray[threadArraySize];
00842
00847     for (int i = 0; i < threadArraySize; ++i) {
00848
00853         if (i % 3 == 0)
00854             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00855         else if (i % 2 == 0)
00856             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00857         else if (i % 1 == 0)
00858             thArray[i] = std::thread(_nesting_, aib_ptr, boi_ptr, std::ref(tm), transferAmount);
00859
00866         //    if (i % 3 == 0)
00867         //        thArray[i] = std::thread(_two_account_transfer_, aib_ptr, boi_ptr, std::ref(tm),
      transferAmount);
00868         //    else if (i % 2 == 0)
00869         //        thArray[i] = std::thread(_six_account_transfer_, boi_ptr, boa_ptr, swplc_ptr, ulster_ptr,
      aib_ptr, unbl_ptr, std::ref(tm), transferAmount);
00870         //    else if (i % 1 == 0)
00871         //        thArray[i] = std::thread(_complex_transfer_, aib_ptr, boi_ptr, std::ref(_customer_vec),
      std::ref(tm), transferAmount);
00872
00873
00878         //        if (i % 3 == 0)
00879         //            thArray[i] = std::thread(_warehouse_transfer_, c_shop, w_dist, std::ref(tm),
      transferAmount);
00880         //        else if (i % 2 == 0)
00881         //            thArray[i] = std::thread(_warehouse_transfer_, k_shop, w_dist, std::ref(tm),
      transferAmount);
00882         //        else if (i % 1 == 0)
00883         //            thArray[i] = std::thread(_warehouse_transfer_, t_shop, w_dist, std::ref(tm),
      transferAmount);
00884
00889         //        if (i % 3 == 0)
00890         //            thArray[i] = std::thread(_nested_warehouse_transfer_, c_shop, d_shop, k_shop, w_dist,
      std::ref(tm), transferAmount);
00891         //        else if (i % 2 == 0)
00892         //            thArray[i] = std::thread(_nested_warehouse_transfer_, k_shop, s_shop, t_shop, w_dist,
      std::ref(tm), transferAmount);
00893         //        else if (i % 1 == 0)
00894         //            thArray[i] = std::thread(_nested_warehouse_transfer_, t_shop, c_shop, s_shop, w_dist,
      std::ref(tm), transferAmount);
00895
00904         //        if (i % 3 == 0)
00905         //            thArray[i] = std::thread(_warehouse_transfer_, c_shop, w_dist, std::ref(tm),
      transferAmount);
00906         //        else if (i % 2 == 0)
00907         //            thArray[i] = std::thread(_nested_warehouse_transfer_, k_shop, s_shop, t_shop, w_dist,
      std::ref(tm), transferAmount);
00908         //        else if (i % 1 == 0)
00909         //            thArray[i] = std::thread(_complex_warehouse_transfer_, d_shop, s_shop, c_shop,
      std::ref(_warehouse_vec), w_dist, std::ref(tm), transferAmount);
00910
00911
00912     }
00913     /*
00914      * Join threads^n -> threadArraySize<br>
00915      * thArray[i].join();
00916      */
00917     for (int i = 0; i < threadArraySize; ++i) {
00918         thArray[i].join();
00919     }
00920
00921
00922     std::cout << "\nMain process print " << std::endl;
00928     /*
00929      * TEST 1 : object requirements
```

```
00930      */
00931     aib_ptr->toString();
00932     boi_ptr->toString();
00933
00934     /*
00935      * TEST 2 : object requirements
00936      */
00937     //    aib_ptr->toString();
00938     //    boi_ptr->toString();
00939     //    boa_ptr->toString();
00940     //    swplc_ptr->toString();
00941     //    ulster_ptr->toString();
00942     //    unbl_ptr->toString();
00943     //    for(int i=0; i<vector_number; ++i){
00944     //        _customer_vec[i]->toString();
00945     //    }
00946
00947     /*
00948      * TEST 3 : object requirements
00949      */
00950     //            w_dist->toString();
00951     //            c_shop->toString();
00952     //            k_shop->toString();
00953     //            t_shop->toString();
00954
00955     /*
00956      * TEST 4 : objects requirements
00957      */
00958     //        w_dist->toString();
00959     //        c_shop->toString();
00960     //        k_shop->toString();
00961     //        t_shop->toString();
00962     //        d_shop->toString();
00963     //        s_shop->toString();
00964
00965     /*
00966      * TEST 5 : objects requirements
00967      */
00968     //        w_dist->toString();
00969     //        c_shop->toString();
00970     //        k_shop->toString();
00971     //        t_shop->toString();
00972     //        d_shop->toString();
00973     //        s_shop->toString();
00974
00975     //        for(auto&& elem: _warehouse_vec){
00976     //            elem->toString(); // virtual dispatch
00977     //
00978     //        }
00979
00980     /* TEST 5 FINISH */
00981
00982
00983     std::cout << "\nMAIN PROCESS EXIT !!!! " << std::endl;
00988     std::shared_ptr<TX> tx = tm._get_tx();
00989
00994     std::cout << "Rollback counter is : " << tx->getTest_counter() << std::endl;
00998     //    std::cout << "[vector_number]" << std::endl;
00999     //    for (int i = 0; i < vector_number; ++i) {
01000     //        //_customer_vec[i]->toString();
01001     //        auto&& os = _customer_vec.at(i);
01002     //        os->toString();
01003     //    }
01004     //    std::cout << "[_warehouse_vec]" << std::endl;
01005     //    for(auto&& elem: _warehouse_vec){
01006     //        elem->toString(); // virtual dispatch
01007     //
01008     //    }
01009     //_customer_vec[10]->toString();
01010
01015     tm._TX_EXIT();
01016     std::cout << "\nPRINT ALL FROM TM !!!! SHOULD BE EMPTY AFTER _TX_EXIT() !!" << std::endl;
01021     tm.print_all();
01022
01023     return 0;
01024 }
```

6.35 OSTM.cpp File Reference

```
#include "OSTM.h"
```

Include dependency graph for OSTM.cpp:



6.36 OSTM.cpp

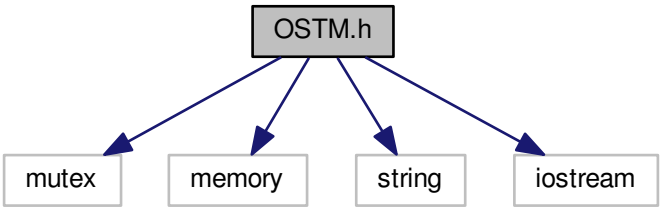
```
00001 /*
00002  * File:   OSTM.cpp
00003  * Author: Zoltan Fuzesi
00004  *
00005  * Created on December 18, 2017, 2:09 PM
00006  * OSTM cpp file methods implementations
00007  */
00008
00009 #include "OSTM.h"
00010
00011 int OSTM::global_Unique_ID_Number = 0;
00012
00020 OSTM::OSTM()
00021 {
00022     this->version = ZERO;
00023     this->uniqueID = Get_global_Unique_ID_Number(); //
      ++global_Unique_ID_Number;
00024     this->canCommit = true;
00025     this->abort_Transaction = false;
00026 }
00027
00028
00036 OSTM::OSTM(int _version_number_, int _unique_id_)
00037 {
00038    // std::cout << "OSTM COPY CONSTRUCTOR" << global_Unique_ID_Number << std::endl;
00039     this->uniqueID = _unique_id_;
00040     this->version = _version_number_;
00041     this->canCommit = true;
00042     this->abort_Transaction = false;
00043 }
00044
00048 OSTM::~OSTM() {
00049     //std::cout << "[OSTM DELETE]" << std::endl;
00050 }
00056 int OSTM::Get_global_Unique_ID_Number() {
00057     if(global_Unique_ID_Number > 10000000)
00058         global_Unique_ID_Number = 0;
00059     return ++global_Unique_ID_Number;
00060 }
00061
00066 void OSTM::Set_Unique_ID(int uniqueID) {
00067     this->uniqueID = uniqueID;
00068 }
00073 int OSTM::Get_Unique_ID() const
00074 {
00075     return uniqueID;
00076 }
00081 void OSTM::Set_Version(int version)
00082 {
```

```
00083     this->version = version;
00084 }
00089 int OSTM::Get_Version() const
00090 {
00091     return version;
00092 }
00097 void OSTM::increase_VersionNumber()
00098 {
00099     this->version += 1;
00100 }
00105 void OSTM::Set_Can_Commit(bool canCommit) {
00106     this->canCommit = canCommit;
00107 }
00112 bool OSTM::Is_Can_Commit() const {
00113     return canCommit;
00114 }
00119 void OSTM::Set_Abort_Transaction(bool abortTransaction) {
00120     this->abort_Transaction = abortTransaction;
00121 }
00126 bool OSTM::Is_Abort_Transaction() const {
00127     return abort_Transaction;
00128 }
00133 void OSTM::lock_Mutex() {
00134     this->mutex.lock();
00135 }
00140 void OSTM::unlock_Mutex() {
00141     this->mutex.unlock();
00142 }
00147 bool OSTM::is_Locked(){
00148     return this->mutex.try_lock();
00149 }
```

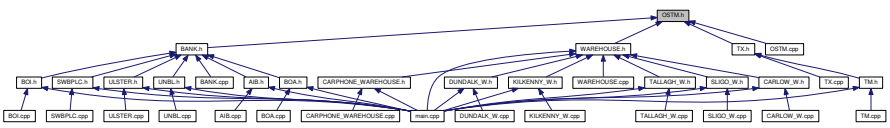
6.37 OSTM.h File Reference

```
#include <mutex>
#include <memory>
#include <string>
#include <iostream>
```

Include dependency graph for OSTM.h:



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



Classes

- class OSTM

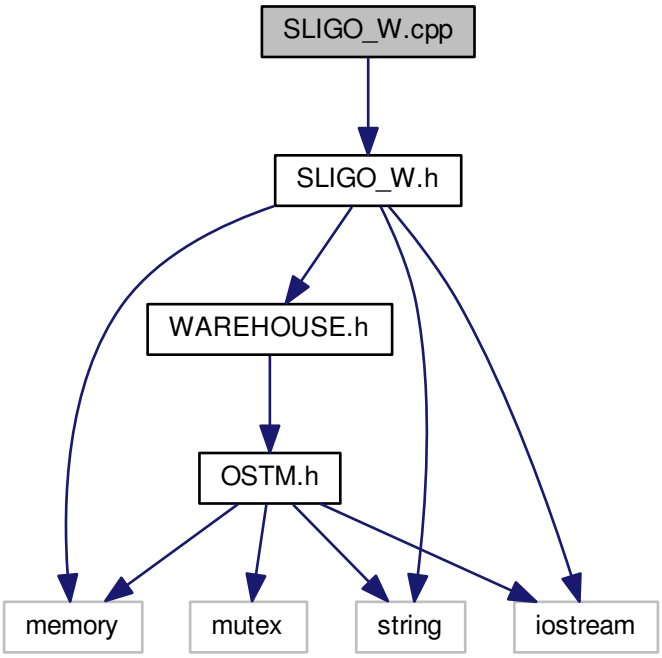
6.38 OSTM.h

```
00001 /*
00002  * File:   OSTM.h
00003  * Author: Zoltan FUzesi
00004  *
00005  * Created on December 18, 2017, 2:09 PM
00006  * OSTM header file fields and  methods declarations
00007  */
00008
00009 #ifndef OSTM_H
00010 #define OSTM_H
00011 #include <mutex>
00012 #include <memory>
00013 #include <string>
00014 #include <iostream>
00015 #include <string>
00016
00017 class OSTM {
00018 public:
00022     OSTM();
00026     OSTM(int _version_number_, int _unique_id_);
00030     virtual ~OSTM();
00034     virtual void copy(std::shared_ptr<OSTM> from, std::shared_ptr<OSTM> to){};
00038     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object){};//std::cout <<
       "[OSTM GETBASECOPY]" << std::endl;};
00042     virtual void toString(){};
00046     void Set_Unique_ID(int uniqueID);
00050     int Get_Unique_ID() const;
00054     void Set_Version(int version);
00058     int Get_Version() const;
00062     void increase_VersionNumber();
00066     bool Is_Can_Commit() const;
00070     void Set_Can_Commit(bool canCommit);
00074     void Set_Abort_Transaction(bool abortTransaction);
00078     bool Is_Abort_Transaction() const;
00082     void lock_Mutex();
00086     void unlock_Mutex();
00090     bool is_Locked();
00091
00092 private:
00093     /*
00094      * \brief Object version number
00095      */
00096     int version;
00097     /*
00098      * \brief Object unique identifier
00099      */
00100     int uniqueID;
00101     /*
00102      * \brief Boolean value to check any other thread failed to commit
00103      */
00104     bool canCommit;
00105     /*
00106      * \brief Abort the transaction
00107      */
00108     bool abort_Transaction;
00112     static int global_Unique_ID_Number;
00116     const int ZERO = 0;
00120     std::mutex mutex;
00124     int Get_global_Unique_ID_Number();
00125
00126 };
00127
00128 #endif /* OSTM_H */
```

6.39 SLIGO_W.cpp File Reference

```
#include "SLIGO_W.h"
```

Include dependency graph for SLIGO_W.cpp:



6.40 SLIGO_W.cpp

```
00001
00002 /*
00003  * File:   SLIGO_W.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "SLIGO_W.h"
00011
00012 SLIGO_W::~SLIGO_W() {
00013 }
00014
00015 SLIGO_W::SLIGO_W(const SLIGO_W& orig) {
00016 }
00022 std::shared_ptr<OSTM> SLIGO_W::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new SLIGO_W(objTO, object->Get_Version(),object->Get_Unique_ID())
      );
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00028     return ostm_obj;
00029 }
00035 void SLIGO_W::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00036
00037     std::shared_ptr<SLIGO_W> objTO = std::dynamic_pointer_cast<SLIGO_W>(to);
00038     std::shared_ptr<SLIGO_W> objFROM = std::dynamic_pointer_cast<SLIGO_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
```

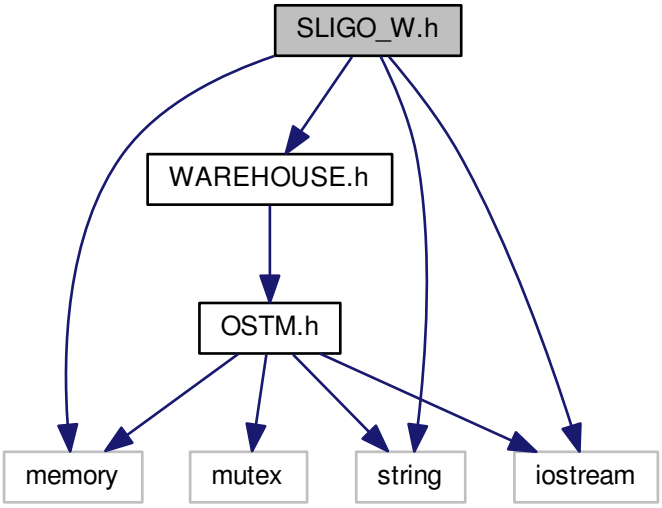
```
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
00055 //std::shared_ptr<SLIGO_W> SLIGO_W::_cast(std::shared_ptr<OSTM> _object){
00056 //
00057 //    return static_cast<std::shared_ptr<SLIGO_W>>(_object);
00058 //}
00062 void SLIGO_W::toString()
00063 {
00064     std::cout << "\n" <<  this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
00066
00067
00068
00069 void SLIGO_W::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00070     this->_number_of_alcatel = _number_of_alcatel;
00071 }
00072
00073 int SLIGO_W::GetNumber_of_alcatel(){
00074     return _number_of_alcatel;
00075 }
00076
00077 void SLIGO_W::SetNumber_of_nokia(int _number_of_nokia) {
00078     this->_number_of_nokia = _number_of_nokia;
00079 }
00080
00081 int SLIGO_W::GetNumber_of_nokia(){
00082     return _number_of_nokia;
00083 }
00084
00085 void SLIGO_W::SetNumber_of_huawei(int
      _number_of_huawei) {
00086     this->_number_of_huawei = _number_of_huawei;
00087 }
00088
00089 int SLIGO_W::GetNumber_of_huawei(){
00090     return _number_of_huawei;
00091 }
00092
00093 void SLIGO_W::SetNumber_of_sony(int _number_of_sony) {
00094     this->_number_of_sony = _number_of_sony;
00095 }
00096
00097 int SLIGO_W::GetNumber_of_sony(){
00098     return _number_of_sony;
00099 }
00100
00101 void SLIGO_W::SetNumber_of_samsung(int
      _number_of_samsung) {
00102     this->_number_of_samsung = _number_of_samsung;
00103 }
00104
00105 int SLIGO_W::GetNumber_of_samsung(){
00106     return _number_of_samsung;
00107 }
00108
00109 void SLIGO_W::SetNumber_of_iphones(int
      _number_of_iphones) {
00110     this->_number_of_iphones = _number_of_iphones;
00111 }
00112
00113 int SLIGO_W::GetNumber_of_iphones(){
00114     return _number_of_iphones;
00115 }
00116
00117 void SLIGO_W::SetShop_name(std::string _shop_name) {
00118     this->_shop_name = _shop_name;
00119 }
00120
00121 std::string SLIGO_W::GetShop_name(){
00122     return _shop_name;
00123 }
```

```
00124
00125 void SLIGO_W::SetShop_address(std::string _shop_address) {
00126     this->_shop_address = _shop_address;
00127 }
00128
00129 std::string SLIGO_W::GetShop_address(){
00130     return _shop_address;
00131 }
00132
00133
00134
```

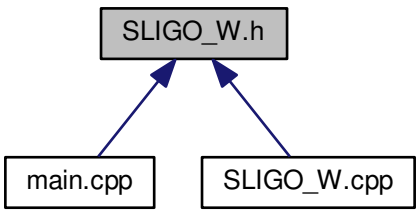
6.41 SLIGO_W.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for SLIGO_W.h:



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



Classes

- class SLIGO_W

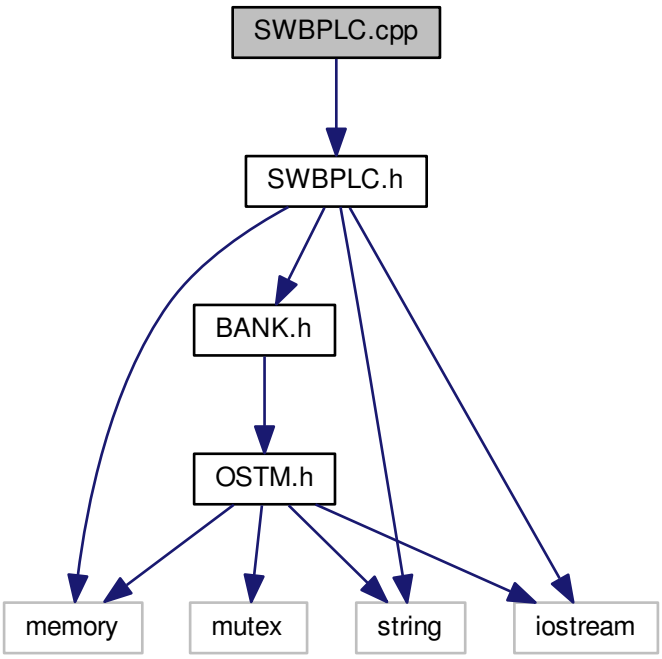
6.42 SLIGO_W.h

```
00001
00002 /*
00003  * File:   SLIGO_W.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef SLIGO_W_H
00011 #define SLIGO_W_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class SLIGO_W :public WAREHOUSE {
00020 public:
00024     SLIGO_W() : WAREHOUSE(){
00025
00026         this->_shop_address = "Sligo River Street";
00027         this->_shop_name = "SLIGO S_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
00038     SLIGO_W(std::string address, std::string shop_name, int iphone, int samsung, int sony, int
      huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     SLIGO_W(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     SLIGO_W(const SLIGO_W& orig);
00075     SLIGO_W operator=(const SLIGO_W& orig){};
00079     virtual ~SLIGO_W();
00080
00081     /*
00082      * Implement OSTM virtual methods
00083      */
00084    // virtual std::shared_ptr<SLIGO_W> _cast(std::shared_ptr<OSTM> _object);
00085     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00086     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00087     virtual void toString();
00088     /*
00089      * Implement Warehouse methods
00090      */
00091     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00092     virtual int GetNumber_of_alcatel();
00093     virtual void SetNumber_of_nokia(int _number_of_nokia);
00094     virtual int GetNumber_of_nokia();
00095     virtual void SetNumber_of_huawei(int _number_of_huawei);
```

```
00096     virtual int GetNumber_of_huawei();
00097     virtual void SetNumber_of_sony(int _number_of_sony);
00098     virtual int GetNumber_of_sony();
00099     virtual void SetNumber_of_samsung(int _number_of_samsung);
00100     virtual int GetNumber_of_samsung();
00101     virtual void SetNumber_of_iphones(int _number_of_iphones);
00102     virtual int GetNumber_of_iphones();
00103     virtual void SetShop_name(std::string _shop_name);
00104     virtual std::string GetShop_name();
00105     virtual void SetShop_address(std::string _shop_address);
00106     virtual std::string GetShop_address();
00107
00108
00109 private:
00110     std::string _shop_address;
00111     std::string _shop_name;
00112     int _number_of_iphones;
00113     int _number_of_samsung;
00114     int _number_of_sony;
00115     int _number_of_huawei;
00116     int _number_of_nokia;
00117     int _number_of_alcatel;
00118
00119 };
00120
00121 #endif /* SLIGO_W_H */
00122
```

6.43 SWBPLC.cpp File Reference

`#include "SWBPLC.h"`
Include dependency graph for SWBPLC.cpp:



6.44 SWBPLC.cpp

```
00001
```

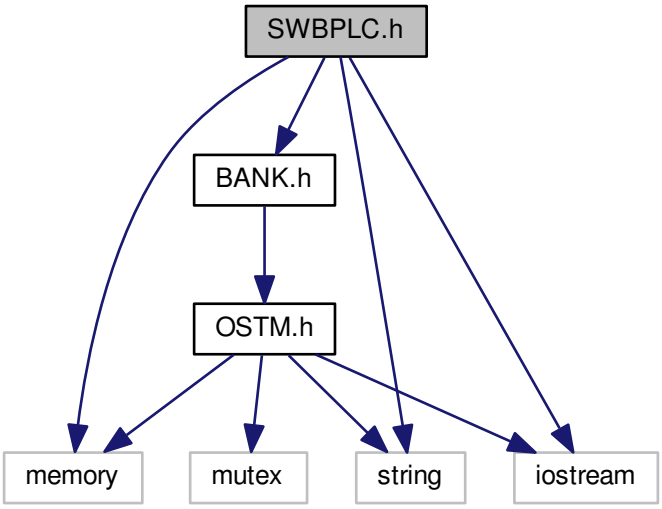
```
00002 /*
00003  * File:   SWBPLC.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "SWBPLC.h"
00011
00012 SWBPLC::SWBPLC(const SWBPLC& orig) {
00013 }
00014
00015 SWBPLC::~SWBPLC() {
00016 }
00022 std::shared_ptr<OSTM> SWBPLC::getBaseCopy(std::shared_ptr<OSTM> object)
00023 {
00024     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00025     std::shared_ptr<BANK> obj(new SWBPLC(objTO,object->Get_Version(),object->Get_Unique_ID()));
00026     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00027     return ostm_obj;
00028 }
00034 void SWBPLC::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00035
00036     std::shared_ptr<SWBPLC> objTO = std::dynamic_pointer_cast<SWBPLC>(to);
00037     std::shared_ptr<SWBPLC> objFROM = std::dynamic_pointer_cast<SWBPLC>(from);
00038     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00039     objTO->Set_Version(objFROM->Get_Version());
00040     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00041     objTO->SetBalance(objFROM->GetBalance());
00042
00043
00044 }
00048 //std::shared_ptr<SWBPLC> SWBPLC::_cast(std::shared_ptr<OSTM> _object){
00049 //
00050 //    return static_cast<std::shared_ptr<SWBPLC>>(_object);
00051 //}
00055 void SWBPLC::toString()
00056 {
00057      std::cout << "\nSWBPLC BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt
       account : " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00058 }
00059
00060 void SWBPLC::SetAddress(std::string address) {
00061     this->address = address;
00062 }
00063
00064 std::string SWBPLC::GetAddress() const {
00065     return address;
00066 }
00067
00068 void SWBPLC::SetBalance(double balance) {
00069     this->balance = balance;
00070 }
00071
00072 double SWBPLC::GetBalance() const {
00073     return balance;
00074 }
00075
00076 void SWBPLC::SetAccountNumber(int accountNumber) {
00077     this->accountNumber = accountNumber;
00078 }
00079
00080 int SWBPLC::GetAccountNumber() const {
00081     return accountNumber;
00082 }
00083
00084 void SWBPLC::SetLastName(std::string lastName) {
00085     this->lastName = lastName;
00086 }
00087
00088 std::string SWBPLC::GetLastName() const {
00089     return lastName;
00090 }
00091
00092 void SWBPLC::SetFirstName(std::string firstName) {
00093     this->firstName = firstName;
00094 }
00095
00096 std::string SWBPLC::GetFirstName() const {
00097     return firstName;
00098 }
00099
00100 void SWBPLC::SetFullname(std::string fullname) {
```

```
00101     this->fullname = fullname;
00102 }
00103
00104 std::string SWBPLC::GetFullname() const {
00105     return fullname;
00106 }
00107
```

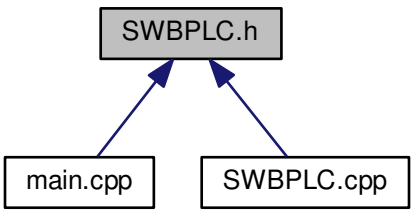
6.45 SWBPLC.h File Reference

```
#include "BANK.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for SWBPLC.h:



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



Classes

- class SWBPLC

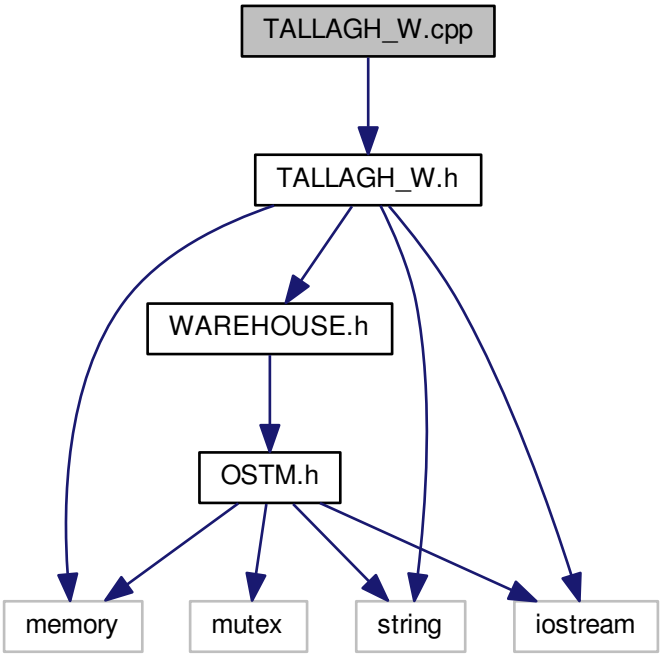
6.46 SWBPLC.h

```
00001
00002 /*
00003  * File:   SWBPLC.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef SWBPLC_H
00011 #define SWBPLC_H
00012 #include "BANK.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class SWBPLC : public BANK {
00020 public:
00024     SWBPLC() : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
00035     SWBPLC(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address) :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
00046     SWBPLC(std::shared_ptr<BANK> obj, int _version, int _unique_id) : BANK(_version, _unique_id)
      {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054
00055     };
00059     SWBPLC(const SWBPLC& orig);
00063     SWBPLC operator=(const SWBPLC& orig) {};
00067     virtual ~SWBPLC();
00068
00069     /*
00070      * Implement OSTM virtual methods
00071      */
00072     //virtual std::shared_ptr<SWBPLC> _cast(std::shared_ptr<OSTM> _object);
00073     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00074     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00075     virtual void toString();
00076
00077     /*
00078      * Implement BANK virtual methods
00079      */
00080     virtual void SetAddress(std::string address);
00081     virtual std::string GetAddress() const;
00082     virtual void SetBalance(double balance);
00083     virtual double GetBalance() const;
00084     virtual void SetAccountNumber(int accountNumber);
00085     virtual int GetAccountNumber() const;
00086     virtual void SetLastName(std::string lastName);
00087     virtual std::string GetLastName() const;
00088     virtual void SetFirstName(std::string firstName);
00089     virtual std::string GetFirstName() const;
00090     virtual void SetFullname(std::string fullname);
00091     virtual std::string GetFullname() const;
00092 private:
00093     std::string fullname;
00094     std::string firstName;
```

```
00095     std::string lastName;
00096     int accountNumber;
00097     double balance;
00098     std::string address;
00099
00100 };
00101
00102 #endif /* SWBPLC_H */
00103
```

6.47 TALLAGH_W.cpp File Reference

`#include "TALLAGH_W.h"`
Include dependency graph for TALLAGH_W.cpp:



6.48 TALLAGH_W.cpp

```
00001
00002 /*
00003  * File:   TALLAGH_W.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "TALLAGH_W.h"
00011
00012 TALLAGH_W::~TALLAGH_W() {
00013 }
00014
00015 TALLAGH_W::TALLAGH_W(const TALLAGH_W& orig) {
00016 }
00022 std::shared_ptr<OSTM> TALLAGH_W::getBaseCopy(std::shared_ptr<OSTM> object)
```

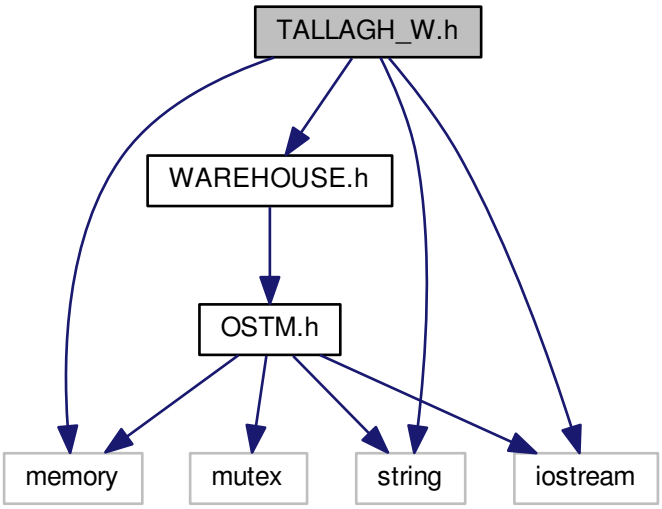
```
00023 {
00024
00025     std::shared_ptr<WAREHOUSE> objTO = std::dynamic_pointer_cast<WAREHOUSE>(object);
00026     std::shared_ptr<WAREHOUSE> obj(new TALLAGH_W(objTO, object->Get_Version(),object->
      Get_Unique_ID()));
00027     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00028     return ostm_obj;
00029 }
00035 void TALLAGH_W::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00036
00037     std::shared_ptr<TALLAGH_W> objTO = std::dynamic_pointer_cast<TALLAGH_W>(to);
00038     std::shared_ptr<TALLAGH_W> objFROM = std::dynamic_pointer_cast<TALLAGH_W>(from);
00039     objTO->_shop_address = objFROM->GetShop_address();
00040     objTO->_shop_name = objFROM->GetShop_name();
00041     objTO->_number_of_iphones = objFROM->GetNumber_of_iphones();
00042     objTO->_number_of_samsung = objFROM->GetNumber_of_samsung();
00043     objTO->_number_of_sony = objFROM->GetNumber_of_sony();
00044     objTO->_number_of_huawei = objFROM->GetNumber_of_huawei();
00045     objTO->_number_of_nokia = objFROM->GetNumber_of_nokia();
00046     objTO->_number_of_alcatel = objFROM->GetNumber_of_alcatel();
00047     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00048     objTO->Set_Version(objFROM->Get_Version());
00049
00050
00051 }
00055 //std::shared_ptr<TALLAGH_W> TALLAGH_W::_cast(std::shared_ptr<OSTM> _object){
00056 //
00057 //    return static_cast<std::shared_ptr<TALLAGH_W>>(_object);
00058 //}
00062 void TALLAGH_W::toString()
00063 {
00064     std::cout << "\n" << this->GetShop_name() << "\nUnique ID : " << this->
      Get_Unique_ID() << "\nShop Name : "  << this->GetShop_name() << "\nShop Address :
      " << this->GetShop_address() << "\nNo. Iphones : " << this->
      GetNumber_of_iphones() << "\nNo. Samsung : " << this->
      GetNumber_of_samsung() << "\nNo. Sony : " << this->
      GetNumber_of_sony() << "\nNo. Huawei : " << this->
      GetNumber_of_huawei() << "\nNo. Nokia : " << this->
      GetNumber_of_nokia() << "\nNo. Alcatel : " << this->
      GetNumber_of_alcatel() << "\nVersion number : " << this->
      Get_Version() << std::endl;
00065 }
00066
00067 void TALLAGH_W::SetNumber_of_alcatel(int
      _number_of_alcatel) {
00068     this->_number_of_alcatel = _number_of_alcatel;
00069 }
00070
00071 int TALLAGH_W::GetNumber_of_alcatel(){
00072     return _number_of_alcatel;
00073 }
00074
00075 void TALLAGH_W::SetNumber_of_nokia(int
      _number_of_nokia) {
00076     this->_number_of_nokia = _number_of_nokia;
00077 }
00078
00079 int TALLAGH_W::GetNumber_of_nokia(){
00080     return _number_of_nokia;
00081 }
00082
00083 void TALLAGH_W::SetNumber_of_huawei(int
      _number_of_huawei) {
00084     this->_number_of_huawei = _number_of_huawei;
00085 }
00086
00087 int TALLAGH_W::GetNumber_of_huawei(){
00088     return _number_of_huawei;
00089 }
00090
00091 void TALLAGH_W::SetNumber_of_sony(int
      _number_of_sony) {
00092     this->_number_of_sony = _number_of_sony;
00093 }
00094
00095 int TALLAGH_W::GetNumber_of_sony(){
00096     return _number_of_sony;
00097 }
00098
00099 void TALLAGH_W::SetNumber_of_samsung(int
      _number_of_samsung) {
00100     this->_number_of_samsung = _number_of_samsung;
00101 }
00102
00103 int TALLAGH_W::GetNumber_of_samsung(){
00104     return _number_of_samsung;
```

```
00105 }
00106
00107 void TALLAGH_W::SetNumber_of_iphones(int
      _number_of_iphones) {
00108     this->_number_of_iphones = _number_of_iphones;
00109 }
00110
00111 int TALLAGH_W::GetNumber_of_iphones(){
00112     return _number_of_iphones;
00113 }
00114
00115 void TALLAGH_W::SetShop_name(std::string _shop_name) {
00116     this->_shop_name = _shop_name;
00117 }
00118
00119 std::string TALLAGH_W::GetShop_name(){
00120     return _shop_name;
00121 }
00122
00123 void TALLAGH_W::SetShop_address(std::string
      _shop_address) {
00124     this->_shop_address = _shop_address;
00125 }
00126
00127 std::string TALLAGH_W::GetShop_address(){
00128     return _shop_address;
00129 }
```

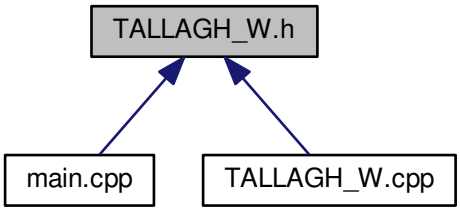
6.49 TALLAGH_W.h File Reference

```
#include "WAREHOUSE.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for TALLAGH_W.h:



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



Classes

- class TALLAGH_W

6.50 TALLAGH_W.h

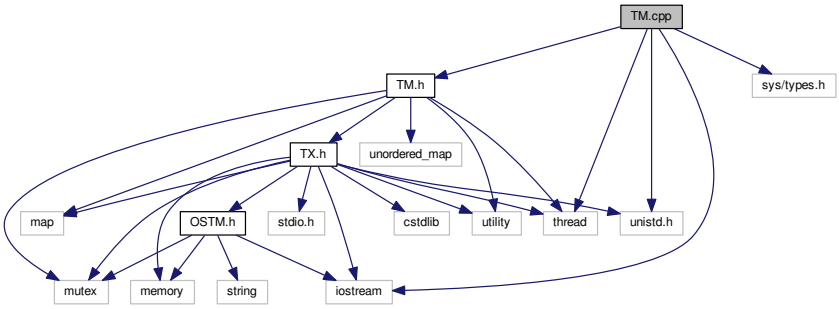
```
00001
00002 /*
00003  * File:   TALLAGH_W.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef TALLAGH_W_H
00011 #define TALLAGH_W_H
00012 #include "WAREHOUSE.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class TALLAGH_W :public WAREHOUSE {
00020 public:
00024     TALLAGH_W() : WAREHOUSE(){
00025
00026         this->_shop_address = "Tallagh Low street";
00027         this->_shop_name = "TALLAGH T_WAREHOUSE";
00028         this->_number_of_iphones = 200;
00029         this->_number_of_samsung = 200;
00030         this->_number_of_sony = 200;
00031         this->_number_of_huawei = 200;
00032         this->_number_of_nokia = 200;
00033         this->_number_of_alcatel = 200;
00034     };
00038     TALLAGH_W(std::string address, std::string shop_name, int iphone, int samsung, int sony, int
      huawei, int nokia, int alcatel): WAREHOUSE(){
00039         /*
00040          * copy over values
00041          */
00042         this->_shop_address = address;
00043         this->_shop_name = shop_name;
00044         this->_number_of_iphones = iphone;
00045         this->_number_of_samsung = samsung;
00046         this->_number_of_sony = sony;
00047         this->_number_of_huawei = huawei;
00048         this->_number_of_nokia = nokia;
00049         this->_number_of_alcatel = alcatel;
00050
00051     };
00055     TALLAGH_W(std::shared_ptr<WAREHOUSE> obj, int _version, int _unique_id):
      WAREHOUSE(_version, _unique_id){
00056         /*
00057          * copy over values
00058          */
```

```
00059         this->_shop_address = obj->GetShop_address();
00060         this->_shop_name = obj->GetShop_name();
00061         this->_number_of_iphones = obj->GetNumber_of_iphones();
00062         this->_number_of_samsung = obj->GetNumber_of_samsung();
00063         this->_number_of_sony = obj->GetNumber_of_sony();
00064         this->_number_of_huawei = obj->GetNumber_of_huawei();
00065         this->_number_of_nokia = obj->GetNumber_of_nokia();
00066         this->_number_of_alcatel = obj->GetNumber_of_alcatel();
00067     }
00071     TALLAGH_W(const TALLAGH_W& orig);
00075     TALLAGH_W operator=(const TALLAGH_W& orig){};
00079     virtual ~TALLAGH_W();
00080
00081     /*
00082      * Implement OSTM virtual methods
00083      */
00084     //virtual std::shared_ptr<TALLAGH_W> _cast(std::shared_ptr<OSTM> _object);
00085     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00086     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00087     virtual void toString();
00088     /*
00089      * Implement Warehouse methods
00090      */
00091     virtual void SetNumber_of_alcatel(int _number_of_alcatel);
00092     virtual int GetNumber_of_alcatel();
00093     virtual void SetNumber_of_nokia(int _number_of_nokia);
00094     virtual int GetNumber_of_nokia();
00095     virtual void SetNumber_of_huawei(int _number_of_huawei);
00096     virtual int GetNumber_of_huawei();
00097     virtual void SetNumber_of_sony(int _number_of_sony);
00098     virtual int GetNumber_of_sony();
00099     virtual void SetNumber_of_samsung(int _number_of_samsung);
00100     virtual int GetNumber_of_samsung();
00101     virtual void SetNumber_of_iphones(int _number_of_iphones);
00102     virtual int GetNumber_of_iphones();
00103     virtual void SetShop_name(std::string _shop_name);
00104     virtual std::string GetShop_name();
00105     virtual void SetShop_address(std::string _shop_address);
00106     virtual std::string GetShop_address();
00107
00108
00109 private:
00110     std::string _shop_address;
00111     std::string _shop_name;
00112     int _number_of_iphones;
00113     int _number_of_samsung;
00114     int _number_of_sony;
00115     int _number_of_huawei;
00116     int _number_of_nokia;
00117     int _number_of_alcatel;
00118
00119 };
00120
00121 #endif /* TALLAGH_W_H */
00122
```

6.51 TM.cpp File Reference

```
#include "TM.h"
#include <thread>
#include <unistd.h>
#include <sys/types.h>
#include <iostream>
```

Include dependency graph for TM.cpp:



6.52 TM.cpp

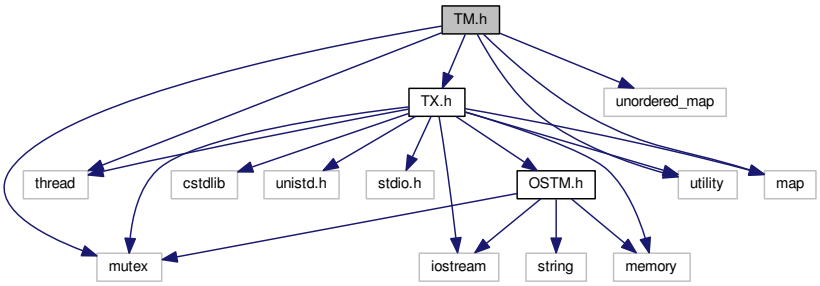
```
00001 /*
00002  * File:   TM.cpp
00003  * Author: Zoltan Fuzesi
00004  *
00005  * Created on December 18, 2017, 2:09 PM
00006  * Transaction Manager class methods implementation
00007  */
00008 #include "TM.h"
00009 #include <thread>
00010 #include <unistd.h>
00011 //#include <process.h>
00012 #include <sys/types.h>
00013 #include <iostream>
00014
00018 int TM::_tm_id;
00022 std::map<int, std::map< std::thread::id, int >> TM::process_map_collection;
00028 TM& TM::Instance() {
00029     static TM _instance;
00030     _instance._tm_id = getpid();
00031
00032     return _instance;
00033 }
00034
00035 //TM Transaction managger checking the Process ID existence in the map
00036 //If not in the map then register
00043 void TM::registerTX()
00044 {
00045     std::lock_guard<std::mutex> guard(register_Lock);
00046     int ppid = getpid();
00047     std::map<int, std::map< std::thread::id, int >>::iterator process_map_collection_Iterator =
    TM::process_map_collection.find(ppid);
00048     if (process_map_collection_Iterator == TM::process_map_collection.end()) {
00049         /*
00050          * Register main process/application to the global map
00051          */
00052         std::map< std::thread::id, int >map = get_thread_Map();
00053         TM::process_map_collection.insert({ppid, map});
00054
00055     }
00056     std::map<std::thread::id, std::shared_ptr < TX>>::iterator it = txMap.find(
    std::this_thread::get_id());
00057     if (it == txMap.end()) {
00058         std::shared_ptr<TX> _transaction_object(new TX(std::this_thread::get_id()));
00059         txMap.insert({std::this_thread::get_id(), _transaction_object});
00060         /*
00061          * Get the map if registered first time
00062          */
00063         process_map_collection_Iterator = TM::process_map_collection.find(ppid);
00064         /*
00065          * Insert to the GLOBAL MAP as a helper to clean up at end of main process
00066          */
00067         process_map_collection_Iterator->second.insert({std::this_thread::get_id(), 1});
00068
00069     }
00070
00071 }
00072
```

```
00078 std::shared_ptr<TX>const TM::_get_tx()
00079 {
00080     std::lock_guard<std::mutex> guard(get_Lock);
00081 
00082     std::map<std::thread::id, std::shared_ptr<TX>>::iterator it = txMap.find(std::this_thread::get_id(
      ));
00083     if(it == txMap.end())
00084     {
00085        registerTX();
00086        it = txMap.find(std::this_thread::get_id());
00087 
00088     } else {
00089         it->second->_increase_tx_nesting();
00090     }
00091     //it = txMap.find(std::this_thread::get_id());
00092 
00093 
00094     return it->second;
00095 
00096 }
00101 void TM::_TX_EXIT(){
00102     TX tx(std::this_thread::get_id());
00103     int ppid = getpid();
00104     std::map<int, std::map< std::thread::id, int >>::iterator process_map_collection_Iterator =
      TM::process_map_collection.find(ppid);
00105     if (process_map_collection_Iterator != TM::process_map_collection.end()) {
00106 
00107         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00108             /*
00109              * Delete all transaction associated with the actual main process
00110              */
00111             txMap.erase(current->first);
00112         }
00113         TM::process_map_collection.erase(ppid);
00114 
00115     }
00116     tx.ostm_exit();
00117 }
00121 void TM::print_all(){
00122     get_Lock.lock();
00123     for (auto current = txMap.begin(); current != txMap.end(); ++current) {
00124         std::cout << "KEY : " << current->first << std::endl;
00125     }
00126     get_Lock.unlock();
00127 }
00128 
00133 std::map< std::thread::id, int > TM::get_thread_Map() {
00134     std::map< std::thread::id, int > thread_Map;
00135     return thread_Map;
00136 }
```

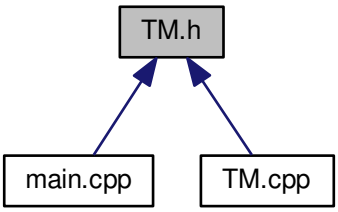
6.53 TM.h File Reference

```
#include <thread>
#include <mutex>
#include <unordered_map>
#include <utility>
#include <map>
#include "TX.h"
```

Include dependency graph for TM.h:



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



Classes

- class TM

6.54 TM.h

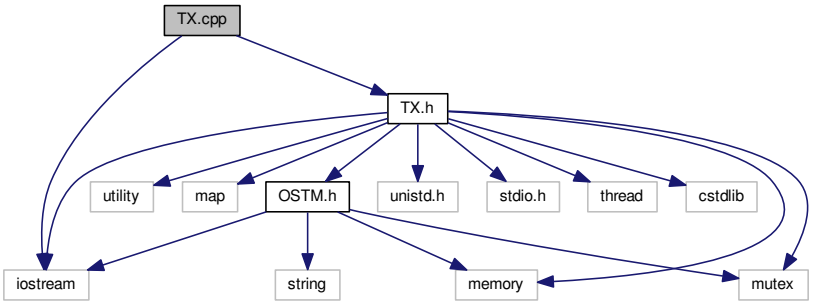
```
00001
00067 #ifndef TM_H
00068 #define TM_H
00069
00070 #include <thread>
00071 //#include <unistd.h>//used for pid_t
00072 //#include <io.h>
00073 #include <mutex>
00074 #include <unordered_map>
00075 #include <utility>
00076 //#include <process.h>
00077 #include <map>
00078 #include "TX.h"
00079
00080 class TM {
00081 private:
00085     TM() = default;
00089     ~TM() = default;
00093     TM(const TM&) = delete;
00097     TM& operator=(const TM&) = delete;
00101     std::map<std::thread::id, std::shared_ptr<TX>>txMap;
00106     static std::map<int, std::map< std::thread::id, int >>
```

```
    process_map_collection;
00110     std::map< std::thread::id, int > get_thread_Map();
00114     void registerTX();
00118     std::mutex register_Lock;
00122     std::mutex get_Lock;
00126     static int _tm_id;
00127
00128
00129 public:
00130
00134     static TM& Instance();
00138     std::shared_ptr<TX>const _get_tx();
00142     void _TX_EXIT();
00146     void print_all();
00147
00148
00149 };
00150
00151
00152 #endif // TM_H
```

6.55 TX.cpp File Reference

```
#include "TX.h"
#include <iostream>
```

Include dependency graph for TX.cpp:



6.56 TX.cpp

```
00001 /*
00002  * File:   TX.cpp
00003  * Author: Zoltan Fuzesi
00004  *
00005  * Created on December 18, 2017, 2:09 PM
00006  * TX cpp file methods implementations
00007  */
00008 #include "TX.h"
00009 #include <iostream>
00013 std::map<int, std::shared_ptr<OSTM> >TX::main_Process_Map_collection;
00017 std::map<int, std::map< int, int >> TX::process_map_collection;
00021 std::mutex TX::register_Lock;
00025 int TX::test_counter = 0;
00031 TX::TX(std::thread::id id) {
00032     this->transaction_Number = id;
00033     this->_tx_nesting_level = 0;
00034 }
00038 TX::~TX() {
00039
00040 }
00044 TX::TX(const TX& orig) {
00045
00046 }
00047
00052 void TX::th_exit() {
```

```
00053
00054     if (this->_tx_nesting_level > 0) {
00055         /*
00056          * Active nested transactions running in background, do not delete anything yet
00057          */
00058     } else {
00059         /*
00060          * Remove all elements map entries from transaction and clear the map
00061          */
00062         working_Map_collection.clear();
00063     }
00064 }
00065
00072 void TX::ostm_exit() {
00073     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00074
00075     int ppid = getpid();
00076     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00077     if (process_map_collection_Iterator != TX::process_map_collection.end()) {
00078
00079         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00080             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(current->first);
00081
00082             if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()){
00083                 /*
00084                  * Delete element from shared main_Process_Map_collection by object unique key value,
       shared_ptr will destroy automatically
00085                  */
00086                 TX::main_Process_Map_collection.erase(
      main_Process_Map_collection_Iterator->first);
00087             }
00088         }
00089         /*
00090          * Delete from Process_map_collection, Main process exits delete association with library
00091          */
00092         TX::process_map_collection.erase(process_map_collection_Iterator->first);
00093     }
00094 }
00095
00104 void TX::_register(std::shared_ptr<OSTM> object) {
00105     /*
00106      * MUST USE SHARED LOCK TO PROTECT SHARED GLOBAL MAP/COLLECTION
00107      */
00108     std::lock_guard<std::mutex> guard(TX::register_Lock);
00109
00110     /*
00111      * Check for null pointer !
00112      * Null pointer can cause segmentation fault!!!
00113      */
00114     if(object == nullptr){
00115         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN REGISTER FUNCTION]") );
00116     }
00117
00118     int ppid = getpid();
00119     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00120     if (process_map_collection_Iterator == TX::process_map_collection.end()) {
00121         /*
00122          * Register main process/application to the global map
00123          */
00124         std::map< int, int >map =  get_thread_Map();
00125         TX::process_map_collection.insert({ppid, map});
00126         /*
00127          * Get the map if registered first time
00128          */
00129         process_map_collection_Iterator = TX::process_map_collection.find(ppid);
00130     }
00131     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(object->Get_Unique_ID());
00132     if (main_Process_Map_collection_Iterator == TX::main_Process_Map_collection
      .end()) {
00133         /*
00134          * Insert to the GLOBAL MAP
00135          */
00136         TX::main_Process_Map_collection.insert({object->Get_Unique_ID(),
      object});
00137         /*
00138          * Insert to the GLOBAL MAP as a helper to clean up at end of main process
00139          */
00140         process_map_collection_Iterator->second.insert({object->Get_Unique_ID(), 1});
00141     }
00142
00143
```

```
00144     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator
      = working_Map_collection.find(object->Get_Unique_ID());
00145     if (working_Map_collection_Object_Shared_Pointer_Iterator ==
      working_Map_collection.end()) {
00146 
00147         working_Map_collection.insert({object->Get_Unique_ID(), object->getBaseCopy(
      object)});
00148     }
00149 
00150 }
00155 std::shared_ptr<OSTM> TX::load(std::shared_ptr<OSTM> object) {
00156 
00157     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00158     /*
00159      * Check for null pointer !
00160      * Null pointer can cause segmentation fault!!!
00161      */
00162     if(object == nullptr){
00163         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN LOAD FUNCTION]") );
00164     }
00165 
00166         working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.find(object->Get_Unique_ID());
00167 
00168     if (working_Map_collection_Object_Shared_Pointer_Iterator !=
      working_Map_collection.end()) {
00169 
00170         return working_Map_collection_Object_Shared_Pointer_Iterator->second->getBaseCopy(
      working_Map_collection_Object_Shared_Pointer_Iterator->second);
00171 
00172     } else { throw std::runtime_error(std::string("[RUNTIME ERROR : NO OBJECT FOUND LOAD FUNCTION]") );}
00173 }
00178 void TX::store(std::shared_ptr<OSTM> object) {
00179     /*
00180      * Check for null pointer !
00181      * Null pointer can cause segmentation fault!!!
00182      */
00183     if(object == nullptr){
00184         throw std::runtime_error(std::string("[RUNTIME ERROR : NULL POINTER IN STORE FUNCTION]") );
00185     }
00186 
00187     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00188 
00189     working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.find(object->Get_Unique_ID());
00190     if (working_Map_collection_Object_Shared_Pointer_Iterator !=
      working_Map_collection.end()) {
00191 
00192         working_Map_collection_Object_Shared_Pointer_Iterator->second = object;
00193 
00194     } else { std::cout << "[ERROR STORE]" << std::endl; }
00195 }
00202 bool TX::commit() {
00203 
00204     bool can_Commit = true;
00205 
00206     /*
00207      * Dealing with nested transactions first
00208      */
00209     if (this->_tx_nesting_level > 0) {
00210         _decrease_tx_nesting();
00211         return true;
00212     }
00213 
00214     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00215 
00216     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00217     for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00218 
00219             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find(
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Unique_ID());
00220             /*
00221              * Throws runtime error if object can not find
00222              */
00223             if(main_Process_Map_collection_Iterator ==
      TX::main_Process_Map_collection.end())
00224             {
00225                 throw std::runtime_error(std::string("[RUNTIME ERROR : CAN'T FIND OBJECT COMMIT FUNCTION]")
      );
00226             }
00227 
00228         /*
00229          * Busy wait WHILE object locked by other thread
```

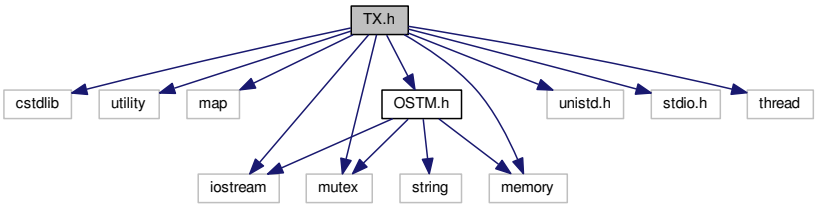
```
00230          */
00231         while(!(main_Process_Map_collection_Iterator->second)->is_Locked());
00232 
00233         if (main_Process_Map_collection_Iterator->second->Get_Version() >
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Version()) {
00234 
00235             working_Map_collection_Object_Shared_Pointer_Iterator->second->Set_Can_Commit(false);
00236             can_Commit = false;
00237             break;
00238         } else {
00239 
00240             working_Map_collection_Object_Shared_Pointer_Iterator->second->Set_Can_Commit(true);
00241         }
00242     }
00243     if (!can_Commit) {
00244         TX::test_counter += 1;
00245         for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00246 
00247             main_Process_Map_collection_Iterator  =
      TX::main_Process_Map_collection.find(
      working_Map_collection_Object_Shared_Pointer_Iterator->second->Get_Unique_ID());
00248             (working_Map_collection_Object_Shared_Pointer_Iterator->second)->copy(
      working_Map_collection_Object_Shared_Pointer_Iterator->second, main_Process_Map_collection_Iterator->second);
00249 
00250         }
00251 
00252         _release_object_lock();
00253 
00254         return false;
00255     } else {
00256         /*
00257          * Commit changes
00258          */
00259         for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00260 
00261                 main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find((
      working_Map_collection_Object_Shared_Pointer_Iterator->second)->Get_Unique_ID());
00262                 if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()) {
00263 
00264                     (main_Process_Map_collection_Iterator->second)->copy(
      main_Process_Map_collection_Iterator->second, working_Map_collection_Object_Shared_Pointer_Iterator->second);
00265                     main_Process_Map_collection_Iterator->second->increase_VersionNumber();
00266 
00267 
00268                 } else {
00269                     throw std::runtime_error(std::string("[RUNTIME ERROR : CAN'T FIND OBJECT COMMIT
       FUNCTION]"));
00270 
00271                 }
00272         }
00273 
00274 
00275         _release_object_lock();
00276         this->th_exit();
00277         return true;
00278     }
00279 }//Commit finish
00280 
00286 void TX::_release_object_lock(){
00287 
00288     std::map< int, std::shared_ptr<OSTM> >::iterator working_Map_collection_Object_Shared_Pointer_Iterator;
00289     std::map<int, std::shared_ptr<OSTM>>::iterator main_Process_Map_collection_Iterator;
00290     for (working_Map_collection_Object_Shared_Pointer_Iterator =
      working_Map_collection.begin(); working_Map_collection_Object_Shared_Pointer_Iterator
       != working_Map_collection.end();
      working_Map_collection_Object_Shared_Pointer_Iterator++) {
00291 
00292             main_Process_Map_collection_Iterator =
      TX::main_Process_Map_collection.find((
      working_Map_collection_Object_Shared_Pointer_Iterator->second)->Get_Unique_ID());
00293             if (main_Process_Map_collection_Iterator !=
      TX::main_Process_Map_collection.end()) {
00294                 /*
00295                  * Release object lock
00296                  */
00297                 (main_Process_Map_collection_Iterator)->second->unlock_Mutex();
00298 
00299             }
00300         }
```

```
00301 }
00302
00307 void TX::_increase_tx_nesting() {
00308
00309     this->_tx_nesting_level += 1;
00310     // std::cout << "[this->_tx_nesting_level] = " << this->_tx_nesting_level << std::endl;
00311 }
00316 void TX::_decrease_tx_nesting() {
00317    // std::cout << "[this->_tx_nesting_level] = " << this->_tx_nesting_level << std::endl;
00318     this->_tx_nesting_level -= 1;
00319 ;
00320 }
00324 int TX::getTest_counter() {
00325     return TX::test_counter;
00326 }
00331 const std::thread::id TX::_get_tx_number() const {
00332     return transaction_Number;
00333 }
00338 std::map< int, int > TX::get_thread_Map() {
00339     std::map< int, int > thread_Map;
00340     return thread_Map;
00341 }
00342
00346 void TX::_print_all_tx() {
00347
00348     std::cout << "[PRINTALLTHREAD]" << std::endl;
00349     std::map< int, std::shared_ptr<OSTM> >::iterator it;
00350     /*
00351      * All registered thread id in the TX global
00352      */
00353     int ppid = getpid();
00354     std::map<int, std::map< int, int >>::iterator process_map_collection_Iterator =
      TX::process_map_collection.find(ppid);
00355     if (process_map_collection_Iterator != TX::process_map_collection.end()) {
00356
00357         for (auto current = process_map_collection_Iterator->second.begin(); current !=
      process_map_collection_Iterator->second.end(); ++current) {
00358             it = working_Map_collection.find(current->first);
00359             if(it != working_Map_collection.end()){
00360                 std::cout << "[Unique number ] : " <<it->second->Get_Unique_ID() << std::endl;
00361             }
00362
00363
00364         }
00365
00366     }
00367 }
```

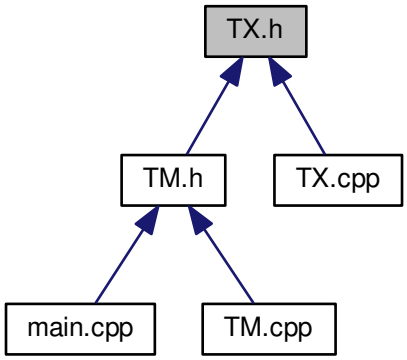
6.57 TX.h File Reference

```
#include <cstdlib>
#include <utility>
#include <map>
#include <iostream>
#include <mutex>
#include <unistd.h>
#include <memory>
#include <stdio.h>
#include <thread>
#include "OSTM.h"
```

Include dependency graph for TX.h:



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



Classes

- class TX

6.58 TX.h

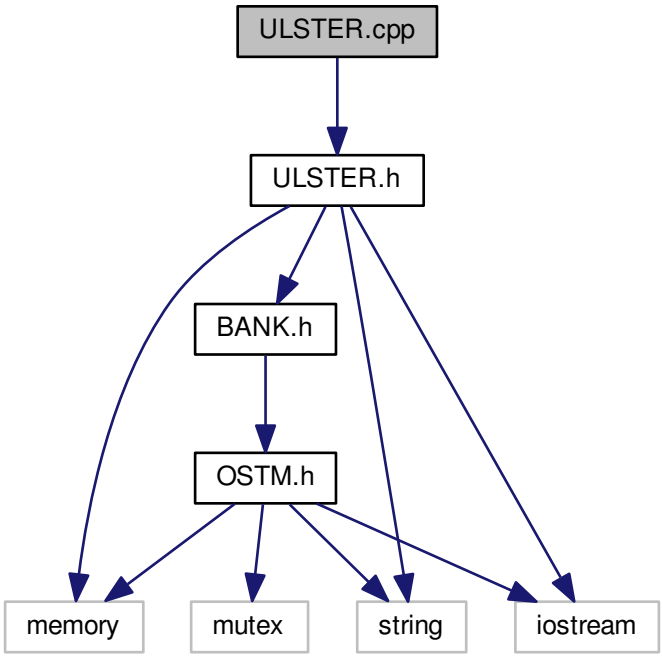
```
00001 /*
00002  * File:   TX.h
00003  * Author: Zoltan Fuzesi
00004  *
00005  * Created on December 18, 2017, 2:09 PM
00006  * Transaction class fields and methods declarations
00007  */
00008
00009 #ifndef TX_H
00010 #define TX_H
00011 #include <cstdlib>
00012 #include <utility>
00013 #include <map>
00014 #include <iostream>
00015 #include <mutex>
00016 #include <unistd.h>
00017 //#include <io.h>
00018 #include <memory>
00019 //#include <process.h>
00020 #include <stdio.h>
00021 #include <thread>
00022 #include "OSTM.h"
00023
00024 class TM;
00025
00026 class TX {
00027 public:
00031     TX(std::thread::id id);
00035     ~TX();
00039     TX(const TX& orig);
00043     void ostm_exit();
00044
00048     void _register(std::shared_ptr<OSTM>  object);
00052     std::shared_ptr<OSTM>  load(std::shared_ptr<OSTM>  object);
00056     void store(std::shared_ptr<OSTM>  object);
00060     bool commit();
00064     void _increase_tx_nesting();
00068     void _decrease_tx_nesting();
00072     friend class TM;
00073     /*
00074      * \brief ONLY FOR TESTING!!! returning the number of rollback happened during transactions
```

```
00075      */
00076     int getTest_counter();
00080     static int test_counter;
00081     /*
00082      * TESTING ONLY
00083      */
00084     void _print_all_tx() ;
00085
00086
00087 private:
00092     std::map< int, std::shared_ptr<OSTM>  > working_Map_collection;
00098     std::thread::id transaction_Number;
00102     int _tx_nesting_level;
00103
00108     static std::map<int, std::shared_ptr<OSTM>  >main_Process_Map_collection;
00113     static std::map<int, std::map< int, int >> process_map_collection;
00114     //static std::map<pid_t, std::map< int, std::pair<ppid, int>  >> process_map_collection;
00118     std::map< int , int > get_thread_Map();
00122     static std::mutex register_Lock;
00126     const std::thread::id _get_tx_number() const;
00127
00131     void _release_object_lock();
00135     void th_exit();
00136
00137
00138
00139 };
00140 #endif // _TX_H_
```

6.59 ULSTER.cpp File Reference

`#include "ULSTER.h"`

Include dependency graph for ULSTER.cpp:



6.60 ULSTER.cpp

```
00001
```

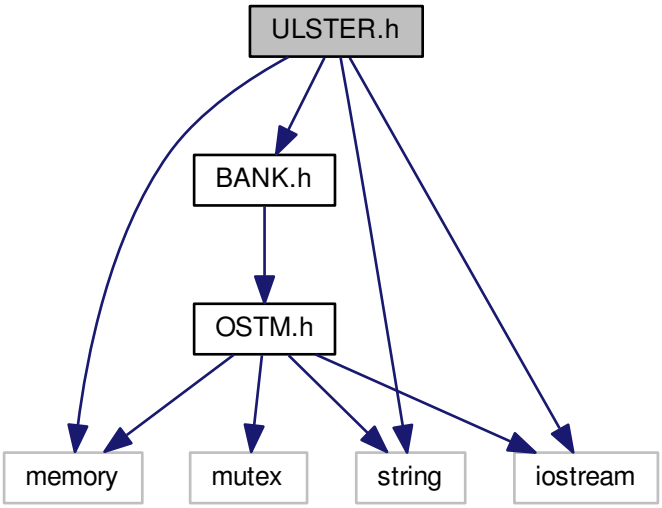
```
00002 /*
00003  * File:   ULSTER.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "ULSTER.h"
00011
00012 //ULSTER::ULSTER() {
00013 //}
00014
00015 ULSTER::ULSTER(const ULSTER& orig) {
00016 }
00017
00018 ULSTER::~ULSTER() {
00019 }
00025 std::shared_ptr<OSTM> ULSTER::getBaseCopy(std::shared_ptr<OSTM> object)
00026 {
00027     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
00028     std::shared_ptr<BANK> obj(new ULSTER(objTO,object->Get_Version(),object->Get_Unique_ID()));
00029     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00030     return ostm_obj;
00031 }
00037 void ULSTER::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00038
00039     std::shared_ptr<ULSTER> objTO = std::dynamic_pointer_cast<ULSTER>(to);
00040     std::shared_ptr<ULSTER> objFROM = std::dynamic_pointer_cast<ULSTER>(from);
00041     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00042     objTO->Set_Version(objFROM->Get_Version());
00043     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00044     objTO->SetBalance(objFROM->GetBalance());
00045
00046
00047 }
00051 //std::shared_ptr<ULSTER> ULSTER::_cast(std::shared_ptr<OSTM> _object){
00052 //
00053 //    return static_cast<std::shared_ptr<ULSTER>>(_object);
00054 //}
00058 void ULSTER::toString()
00059 {
00060    std::cout << "\nULSTER BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account
       : " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00061 }
00062
00063 void ULSTER::SetAddress(std::string address) {
00064     this->address = address;
00065 }
00066
00067 std::string ULSTER::GetAddress() const {
00068     return address;
00069 }
00070
00071 void ULSTER::SetBalance(double balance) {
00072     this->balance = balance;
00073 }
00074
00075 double ULSTER::GetBalance() const {
00076     return balance;
00077 }
00078
00079 void ULSTER::SetAccountNumber(int accountNumber) {
00080     this->accountNumber = accountNumber;
00081 }
00082
00083 int ULSTER::GetAccountNumber() const {
00084     return accountNumber;
00085 }
00086
00087 void ULSTER::SetLastName(std::string lastName) {
00088     this->lastName = lastName;
00089 }
00090
00091 std::string ULSTER::GetLastName() const {
00092     return lastName;
00093 }
00094
00095 void ULSTER::SetFirstName(std::string firstName) {
00096     this->firstName = firstName;
00097 }
00098
00099 std::string ULSTER::GetFirstName() const {
00100     return firstName;
```

```
00101 }
00102
00103 void ULSTER::SetFullname(std::string fullname) {
00104     this->fullname = fullname;
00105 }
00106
00107 std::string ULSTER::GetFullname() const {
00108     return fullname;
00109 }
00110
```

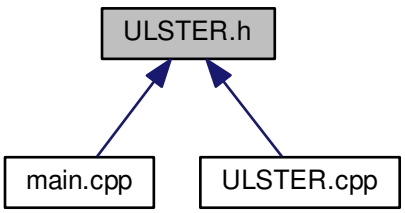
6.61 ULSTER.h File Reference

```
#include "BANK.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for ULSTER.h:



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



Classes

- class ULSTER

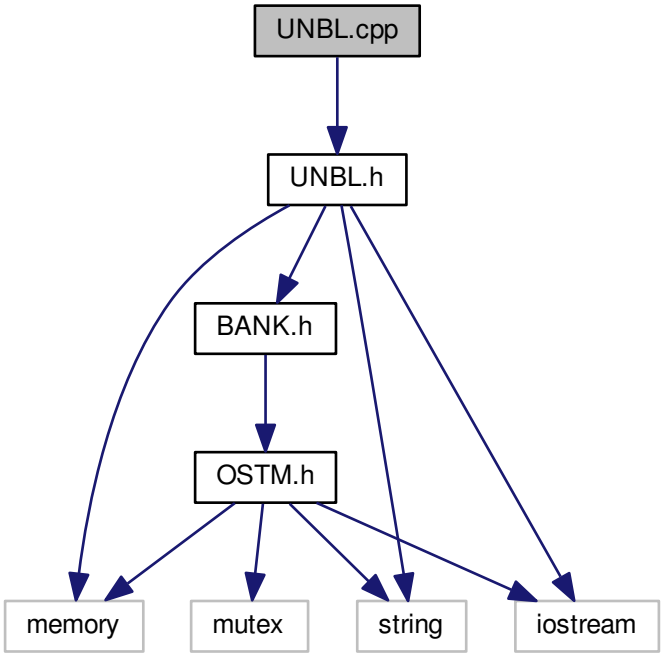
6.62 ULSTER.h

```
00001
00002 /*
00003  * File:   ULSTER.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef ULSTER_H
00011 #define ULSTER_H
00012 #include "BANK.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class ULSTER : public BANK {
00020 public:
00024     ULSTER() : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
00035     ULSTER(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address) :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
00046     ULSTER(std::shared_ptr<BANK> obj, int _version, int _unique_id) : BANK(_version, _unique_id)
      {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
00058     ULSTER(const ULSTER& orig);
00062     ULSTER operator=(const ULSTER& orig) {};
00066     virtual ~ULSTER();
00067
00068     /*
00069      * Implement OSTM virtual methods
00070      */
00071     //virtual std::shared_ptr<ULSTER> _cast(std::shared_ptr<OSTM> _object);
00072     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00073     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00074     virtual void toString();
00075
00076     /*
00077      * Implement BANK virtual methods
00078      */
00079     virtual void SetAddress(std::string address);
00080     virtual std::string GetAddress() const;
00081     virtual void SetBalance(double balance);
00082     virtual double GetBalance() const;
00083     virtual void SetAccountNumber(int accountNumber);
00084     virtual int GetAccountNumber() const;
00085     virtual void SetLastName(std::string lastName);
00086     virtual std::string GetLastName() const;
00087     virtual void SetFirstName(std::string firstName);
00088     virtual std::string GetFirstName() const;
00089     virtual void SetFullname(std::string fullname);
00090     virtual std::string GetFullname() const;
00091 private:
00092     std::string fullname;
00093     std::string firstName;
00094     std::string lastName;
```

```
00095     int accountNumber;
00096     double balance;
00097     std::string address;
00098
00099 };
00100
00101 #endif /* ULSTER_H */
00102
```

6.63 UNBL.cpp File Reference

`#include "UNBL.h"`
Include dependency graph for UNBL.cpp:



6.64 UNBL.cpp

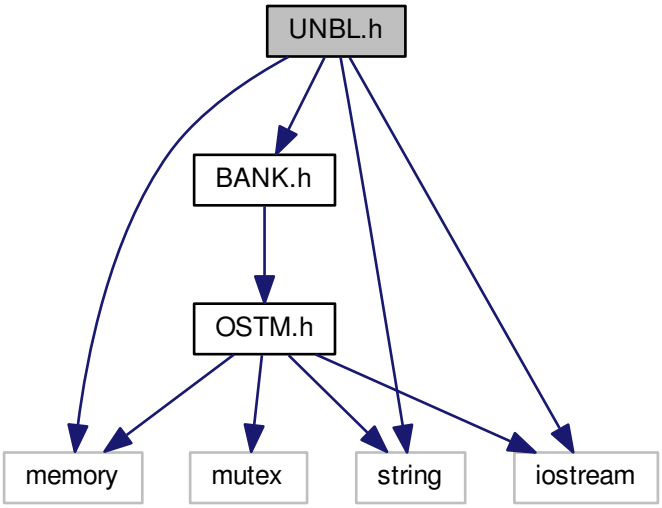
```
00001 /*
00002  * File:   UNBL.cpp
00003  * Author: Zoltan Fuzesi
00004  * IT Carlow : C00197361
00005  *
00006  * Created on January 17, 2018, 8:02 PM
00007  */
00008
00009 #include "UNBL.h"
00010
00011 UNBL::UNBL(const UNBL& orig) {
00012 }
00013
00014 UNBL::~UNBL() {
00015 }
00021 std::shared_ptr<OSTM> UNBL::getBaseCopy(std::shared_ptr<OSTM> object)
00022 {
00023     std::shared_ptr<BANK> objTO = std::dynamic_pointer_cast<BANK>(object);
```

```
00024     std::shared_ptr<BANK> obj(new UNBL(objTO,object->Get_Version(),object->Get_Unique_ID()));
00025     std::shared_ptr<OSTM> ostm_obj = std::dynamic_pointer_cast<OSTM>(obj);

00026     return ostm_obj;
00027 }
00033 void UNBL::copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from){
00034
00035     std::shared_ptr<UNBL> objTO = std::dynamic_pointer_cast<UNBL>(to);
00036     std::shared_ptr<UNBL> objFROM = std::dynamic_pointer_cast<UNBL>(from);
00037     objTO->Set_Unique_ID(objFROM->Get_Unique_ID());
00038     objTO->Set_Version(objFROM->Get_Version());
00039     objTO->SetAccountNumber(objFROM->GetAccountNumber());
00040     objTO->SetBalance(objFROM->GetBalance());
00041
00042 }
00046 //std::shared_ptr<UNBL> UNBL::_cast(std::shared_ptr<OSTM> _object){
00047 //
00048 //    return static_cast<std::shared_ptr<UNBL>>(_object);
00049 //}
00053 void UNBL::toString()
00054 {
00055    std::cout << "\nUNBL BANK" << "\nUnique ID : " << this->Get_Unique_ID() << "\nInt account :
       " << this->GetAccountNumber() << "\nDouble value : " << this->
      GetBalance() << "\nFirst name: " << this->GetFirstName() << "\nLast name : " <<
      this->GetLastName()  << "\nVersion number : " << this->Get_Version() << std::endl;
00056 }
00057
00058 void UNBL::SetAddress(std::string address) {
00059     this->address = address;
00060 }
00061
00062 std::string UNBL::GetAddress() const {
00063     return address;
00064 }
00065
00066 void UNBL::SetBalance(double balance) {
00067     this->balance = balance;
00068 }
00069
00070 double UNBL::GetBalance() const {
00071     return balance;
00072 }
00073
00074 void UNBL::SetAccountNumber(int accountNumber) {
00075     this->accountNumber = accountNumber;
00076 }
00077
00078 int UNBL::GetAccountNumber() const {
00079     return accountNumber;
00080 }
00081
00082 void UNBL::SetLastName(std::string lastName) {
00083     this->lastName = lastName;
00084 }
00085
00086 std::string UNBL::GetLastName() const {
00087     return lastName;
00088 }
00089
00090 void UNBL::SetFirstName(std::string firstName) {
00091     this->firstName = firstName;
00092 }
00093
00094 std::string UNBL::GetFirstName() const {
00095     return firstName;
00096 }
00097
00098 void UNBL::SetFullname(std::string fullname) {
00099     this->fullname = fullname;
00100 }
00101
00102 std::string UNBL::GetFullname() const {
00103     return fullname;
00104 }
00105
```

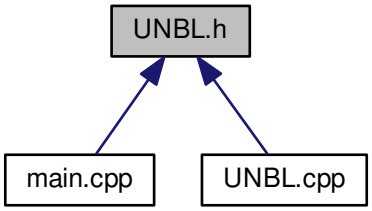
6.65 UNBL.h File Reference

```
#include "BANK.h"
#include <string>
#include <memory>
#include <iostream>
```

Include dependency graph for UNBL.h:



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



Classes

- class UNBL

6.66 UNBL.h

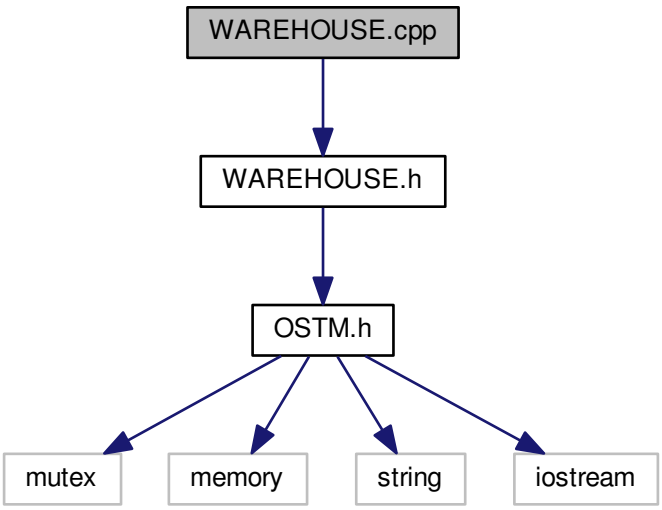
```
00001
00002 /*
00003  * File:   UNBL.h
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
```

```
00008  */
00009
00010 #ifndef UNBL_H
00011 #define UNBL_H
00012 #include "BANK.h"
00013 #include <string>
00014 #include <memory>
00015 #include <iostream>
00019 class UNBL : public BANK {
00020 public:
00024     UNBL() : BANK() {
00025         this->accountNumber = 0;
00026         this->balance = 50;
00027         this->firstName = "Joe";
00028         this->lastName = "Blog";
00029         this->address = "High street, Carlow";
00030         this->fullname = firstName + " " + lastName;
00031     };
00035     UNBL(int accountNumber, double balance, std::string
      firstName, std::string lastName, std::string address) :
      BANK() {
00036         this->accountNumber = accountNumber;
00037         this->balance = balance;
00038         this->firstName = firstName;
00039         this->lastName = lastName;
00040         this->address = address;
00041         this->fullname = firstName + " " + lastName;
00042     };
00046     UNBL(std::shared_ptr<BANK> obj, int _version, int _unique_id) : BANK(_version, _unique_id) {
00047
00048         this->accountNumber = obj->GetAccountNumber();
00049         this->balance = obj->GetBalance();
00050         this->firstName = obj->GetFirstName();
00051         this->lastName = obj->GetLastName();
00052         this->address = obj->GetAddress();
00053         this->fullname = obj->GetFirstName() + " " + obj->GetLastName();
00054     };
00058     UNBL(const UNBL& orig);
00062     UNBL operator=(const UNBL& orig) {};
00066     virtual ~UNBL();
00067
00068     /*
00069      * Implement OSTM virtual methods
00070      */
00071     //virtual std::shared_ptr<UNBL> _cast(std::shared_ptr<OSTM> _object);
00072     virtual void copy(std::shared_ptr<OSTM> to, std::shared_ptr<OSTM> from);
00073     virtual std::shared_ptr<OSTM> getBaseCopy(std::shared_ptr<OSTM> object);
00074     virtual void toString();
00075
00076     /*
00077      * Implement BANK virtual methods
00078      */
00079     virtual void SetAddress(std::string address);
00080     virtual std::string GetAddress() const;
00081     virtual void SetBalance(double balance);
00082     virtual double GetBalance() const;
00083     virtual void SetAccountNumber(int accountNumber);
00084     virtual int GetAccountNumber() const;
00085     virtual void SetLastName(std::string lastName);
00086     virtual std::string GetLastName() const;
00087     virtual void SetFirstName(std::string firstName);
00088     virtual std::string GetFirstName() const;
00089     virtual void SetFullname(std::string fullname);
00090     virtual std::string GetFullname() const;
00091 private:
00092     std::string fullname;
00093     std::string firstName;
00094     std::string lastName;
00095     int accountNumber;
00096     double balance;
00097     std::string address;
00098
00099 };
00100
00101 #endif /* UNBL_H */
00102
```

6.67 WAREHOUSE.cpp File Reference

```
#include "WAREHOUSE.h"
```

Include dependency graph for WAREHOUSE.cpp:



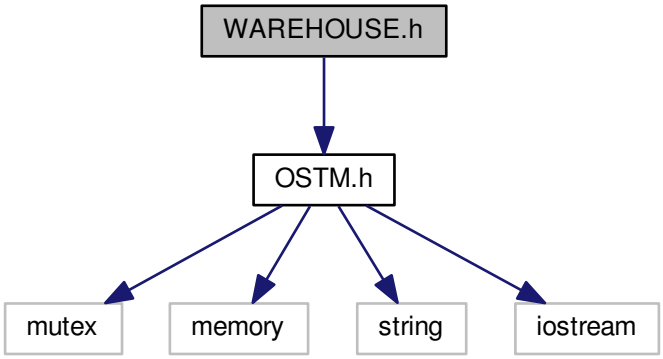
6.68 WAREHOUSE.cpp

```
00001
00002 /*
00003  * File:   WAREHOUSE.cpp
00004  * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #include "WAREHOUSE.h"
00011
00012 WAREHOUSE::WAREHOUSE(const WAREHOUSE& orig) {
00013 }
00014
00015 WAREHOUSE::~WAREHOUSE() {
00016 }
00017
```

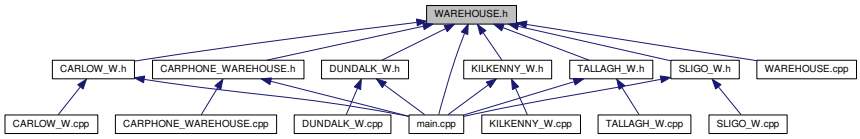
6.69 WAREHOUSE.h File Reference

```
#include "OSTM.h"
```

Include dependency graph for WAREHOUSE.h:



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



Classes

- class WAREHOUSE

6.70 WAREHOUSE.h

```
00001
00002 /*
00003  * File:   WAREHOUSE.h
00004 * Author: Zoltan Fuzesi
00005  * IT Carlow : C00197361
00006  *
00007  * Created on January 17, 2018, 8:02 PM
00008  */
00009
00010 #ifndef WAREHOUSE_H
00011 #define WAREHOUSE_H
00012 #include "OSTM.h"
00016 class WAREHOUSE : public OSTM {
00017 public:
00021     WAREHOUSE():OSTM(){
00022
00023     };
00027     WAREHOUSE(int _version, int _unique_id) : OSTM(_version, _unique_id){
00028
00029     };
00033     WAREHOUSE(const WAREHOUSE& orig);
00037     virtual ~WAREHOUSE();
00038
00039     /*
```

```
00040      * WAREHOUSE BASE METHODS
00041      */
00042
00043     virtual void SetNumber_of_alcatel(int _number_of_alcatel){};
00044     virtual int GetNumber_of_alcatel(){};
00045     virtual void SetNumber_of_nokia(int _number_of_nokia){};
00046     virtual int GetNumber_of_nokia(){};
00047     virtual void SetNumber_of_huawei(int _number_of_huawei){};
00048     virtual int GetNumber_of_huawei(){};
00049     virtual void SetNumber_of_sony(int _number_of_sony){};
00050     virtual int GetNumber_of_sony(){};
00051     virtual void SetNumber_of_samsung(int _number_of_samsung){};
00052     virtual int GetNumber_of_samsung(){};
00053     virtual void SetNumber_of_iphones(int _number_of_iphones){};
00054     virtual int GetNumber_of_iphones(){};
00055     virtual void SetShop_name(std::string _shop_name){};
00056     virtual std::string GetShop_name(){};
00057     virtual void SetShop_address(std::string _shop_address){};
00058     virtual std::string GetShop_address(){};
00059
00060 private:
00061
00062 };
00063
00064 #endif /* WAREHOUSE_H */
00065
```