# Simple TDMA implementation for OMNeT++

Generated by Doxygen 1.8.19

# Chapter 1

# Hierarchical Index

## 1.1 Class Hierarchy

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

# Chapter 2

# Class Index

## 2.1 Class List

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

# Chapter 3

# Class Documentation

## 3.1 AbstractFrame Struct Reference

The AbstractFrame is a data structure to decouple packet representation from the internal OMNeT++/INET data structure.

`#include <RlcCore.h>`

### Public Attributes

- int size
- int seqNum
- bool isEnd
- bool isStart
- double ts

### 3.1.1 Detailed Description

The AbstractFrame is a data structure to decouple packet representation from the internal OMNeT++/INET data structure.

### 3.1.2 Member Data Documentation

#### 3.1.2.1 isEnd

`bool AbstractFrame::isEnd`

indicates whether a packets ends with this frame

#### 3.1.2.2 isStart

```
bool AbstractFrame::isStart
```

indicates whether a new packet starts with this frame

#### 3.1.2.3 seqNum

```
int AbstractFrame::seqNum
```

sequence number

#### 3.1.2.4 size

```
int AbstractFrame::size
```

size of the frame

#### 3.1.2.5 ts

```
double AbstractFrame::ts
```

timestamp to be used to discard very old frames which could not be reassembled

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

- src/rlc/RlcCore.h

## 3.2 AbstractPacket Struct Reference

The AbstractPacket is a data structure to decouple packet representation from the internal OMNeT++/INET data structure.

```
#include <RlcCore.h>
```

### Public Attributes

- int size

### 3.2.1 Detailed Description

The AbstractPacket is a data structure to decouple packet representation from the internal OMNeT++/INET data structure.

### 3.2.2 Member Data Documentation

#### 3.2.2.1 size

```
int AbstractPacket::size
```

size of the packet

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

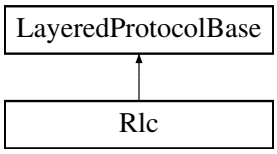
- src/rlc/RlcCore.h

## 3.3 Rlc Class Reference

Rlc is the OMNeT++ wrapper implemenatation of the RLC layer. It borrows its functionality from the RlcCore class.

```
#include <Rlc.h>
```

Inheritance diagram for Rlc:




### Public Member Functions

- int getBufferStatus ()
- void requestFrame (int size)

### Protected Member Functions

- ~Rlc ()
- virtual void **initialize** (int stage) override
- virtual void **sendUp** (cMessage *message)
- virtual void **sendDown** (cMessage *message)
- virtual void **handleMessageWhenDown** (cMessage *msg) override
- virtual void **handleStartOperation** (LifecycleOperation *operation) override
- virtual void **handleStopOperation** (LifecycleOperation *operation) override
- virtual void **handleCrashOperation** (LifecycleOperation *operation) override
- virtual bool **isInitializeStage** (int stage) override
- virtual bool **isModuleStartStage** (int stage) override
- virtual bool **isModuleStopStage** (int stage) override
- virtual bool **isUpperMessage** (cMessage *message) override
- virtual bool **isLowerMessage** (cMessage *message) override
- virtual void **handleUpperPacket** (Packet *packet) override
- virtual void **handleLowerPacket** (Packet *packet) override
- virtual void **handleSelfMessage** (cMessage *message) override

## Protected Attributes

- RlcCore * rlcCore = nullptr
- int **upperLayerInGateId** = -1
- int **upperLayerOutGateId** = -1
- int **lowerLayerInGateId** = -1
- int **lowerLayerOutGateId** = -1

### 3.3.1 Detailed Description

Rlc is the OMNeT++ wrapper implemenatation of the RLC layer. It borrows its functionality from the RlcCore class.

### 3.3.2 Constructor & Destructor Documentation

#### 3.3.2.1 ~Rlc()

```
Rlc::~Rlc ( )  [protected]
```

Standard destructor

### 3.3.3 Member Function Documentation

#### 3.3.3.1 getBufferStatus()

```
int Rlc::getBufferStatus ( )
```

This function returns the current buffer status in bytes

**Returns**

buffer fill level in bytes

#### 3.3.3.2 requestFrame()

```
void Rlc::requestFrame (
            int size )
```

Called from the MAC layer to instruct the RLC layer to send down a frame in the required size

**Parameters**

| | |
|---|---|
| *size* | of the frame in bytes |

### 3.3.4 Member Data Documentation

#### 3.3.4.1 rlcCore

```
RlcCore* Rlc::rlcCore = nullptr  [protected]
```

Reference to the RlcCore instance

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

- src/rlc/Rlc.h
- src/rlc/Rlc.cc

## 3.4 RlcCore Class Reference

RlcCore is a pure C++ implementation of the fragmentation/reassembly logic.

```
#include <RlcCore.h>
```

### Public Member Functions

- RlcCore ()
- ~RlcCore ()
- void addFrame (AbstractFrame frame)
- void addPacket (AbstractPacket packet)
- bool hasFrame ()
- AbstractFrame getFrame (int size)
- vector< AbstractPacket > getCompletePackets ()

### Protected Attributes

- vector< AbstractFrame > receivedFrames
- vector< AbstractPacket > packetQueue

### 3.4.1 Detailed Description

RlcCore is a pure C++ implementation of the fragmentation/reassembly logic.

More to come...

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**Date**

August 2020

### 3.4.2 Constructor & Destructor Documentation

#### 3.4.2.1 RlcCore()

```
RlcCore::RlcCore ( )
```

Standard Constructor

#### 3.4.2.2 ~RlcCore()

```
RlcCore::~RlcCore ( )
```

Standard Destructor

### 3.4.3 Member Function Documentation

#### 3.4.3.1 addFrame()

```
void RlcCore::addFrame (
            AbstractFrame frame )
```

Adds a received frame to the

**Parameters**

| | |
|---|---|
| *AbstractFrame* | frame: The frame to be stored |

#### 3.4.3.2 addPacket()

```
void RlcCore::addPacket (
            AbstractPacket packet )
```

Adds a packet received from the network layer

**Parameters**

| | |
|---|---|
| *AbstractPacket* | packet: The packet received |

#### 3.4.3.3 getCompletePackets()

```
vector<AbstractPacket> RlcCore::getCompletePackets ( )
```

returns all complete packets

**Returns**

A list of all successfully reassembled packets

#### 3.4.3.4 getFrame()

```
AbstractFrame RlcCore::getFrame (
            int size )
```

returns a frame in the required size

**Parameters**

| | |
|---|---|
| *int* | size: Size of the required frame. |

#### 3.4.3.5 hasFrame()

```
bool RlcCore::hasFrame ( )
```

determines whether there is still a frame to send

**Returns**

decision whether there is a frame

### 3.4.4 Member Data Documentation

#### 3.4.4.1 packetQueue

```
vector<AbstractPacket> RlcCore::packetQueue  [protected]
```

Vector to hold all received packets not transmitted yet

#### 3.4.4.2 receivedFrames

```
vector<AbstractFrame> RlcCore::receivedFrames  [protected]
```

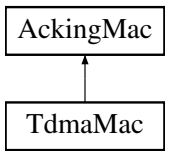
Vector to hold all received frames

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

- src/rlc/RlcCore.h
- src/rlc/RlcCore.cc

## 3.5 TdmaMac Class Reference

Inheritance diagram for TdmaMac:




### Public Member Functions

- void **setSchedule** (vector< int > newSchedule)

### Protected Member Functions

- void **initialize** (int stage) override
- virtual void **handleUpperPacket** (Packet *packet) override
- virtual void **handleSelfMessage** (cMessage *message) override
- virtual void **acked** (Packet *frame) override
- void **receiveSignal** (cComponent *source, simsignal_t signalID, intval_t value, cObject *details) override
- simtime_t **getNextTransmissionSlot** ()
- simtime_t **getFirstSlotInNextFrame** ()
- bool **hasGrant** ()
- bool **hasFutureGrant** ()

### Protected Attributes

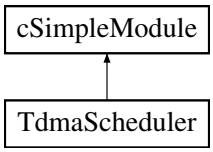
- TdmaScheduler * **scheduler** = nullptr
- vector< int > **schedule**
- int **nodeId**
- double **slotDuration**
- int **frameLength**
- int **currentTransmissionAttemps** = 0
- int **numRetries**
- cMessage * **transmissionSelfMessage** = nullptr

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

- src/mac/TdmaMac.h
- src/mac/TdmaMac.cc

## 3.6 TdmaScheduler Class Reference

Inheritance diagram for TdmaScheduler:




### Public Member Functions

- int **registerClient** (TdmaMac *mac, int bufferStatus)
- void **reportBufferStatus** (int nodeId, int bufferStatus)

### Protected Member Functions

- void **initialize** (int stage) override
- void **createSchedule** ()
- virtual void **handleMessage** (cMessage *message) override

### Protected Attributes

- int **numNodes** = 0
- map< int, TdmaMac * > **clients**
- map< int, int > **bufferStatus**
- vector< int > **schedule**
- double **frameDuration**
- double **slotDuration**
- int **frameLength**
- cMessage * **schedulingSelfMessage** = nullptr

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

- src/scheduler/TdmaScheduler.h
- src/scheduler/TdmaScheduler.cc

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