

CheapBFT

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Chapter 4

Namespace Documentation

4.1 Package eu

Packages

- package [tclouds](#)

4.2 Package eu.tclouds

Packages

- package [cheapbft](#)
- package [tubs](#)

4.3 Package eu.tclouds.cheapbft

Packages

- package [demo](#)
- package [system](#)
- package [util](#)

4.4 Package eu.tclouds.cheapbft.demo

Packages

- package [zk](#)

Classes

- class [CheapBenchmark](#)
- class [CheapBenchmarkClient](#)
- class [CheapIntervalStatistics](#)
- interface [CheapStatisticsListener](#)
- class [CheapThroughputLatencyClient](#)
- class [Configuration](#)

- class [MicroBenchClient](#)
- class [MicroBenchServer](#)
- class [ReplicaMonitor](#)
- class [ThroughputClientBase](#)

4.5 Package eu.tclouds.cheapbft.demo.zk

Classes

- class [MWDataNode](#)
- class [MWDataTree](#)
- class [MWStat](#)
- class [MWZooKeeper](#)
- class [MWZooKeeperClient](#)
- class [MWZooKeeperException](#)
- enum [MWZooKeeperOperation](#)
- class [MWZooKeeperRequest](#)
- class [MWZooKeeperResponse](#)
- class [MWZooKeeperServer](#)
- class [MWZooKeeperServerWorker](#)
- class [Serializer](#)

4.6 Package eu.tclouds.cheapbft.system

Packages

- package [certifier](#)
- package [checkpointer](#)
- package [core](#)
- package [messages](#)
- package [minbft](#)

Classes

- class [AbstractManager](#)
- class [CheapConsensus](#)
- interface [CheapMessageCertifier](#)
- interface [CheapMessageCertifierFactory](#)
- class [CheapMessageReceiver](#)
- class [CheapService](#)
- class [Checkpoint](#)
- class [CheckpointBuilder](#)
- interface [CommunicationLayer](#)
- class [CommunicationLayerImpl](#)
- enum [ConsensusAlgorithms](#)
- class [ConsensusManager](#)
- class [ConsensusProtocol](#)
- enum [ReplicaRole](#)
- class [SequenceValidator](#)

4.7 Package eu.tclouds.cheapbft.system.certifier

Classes

- class [DeviceCASHCertifier](#)
- class [DeviceCASHCertifierFactory](#)
- class [DummyCertifier](#)
- class [DummyCertifierFactory](#)
- class [SoftwareCertifier](#)
- class [SoftwareCertifierFactory](#)
- class [USIGCertifierBase](#)

4.8 Package eu.tclouds.cheapbft.system.checkpointer

Classes

- class [CheckpointCertificate](#)
- class [CheckPointer](#)
- class [LocalCheckpoint](#)

4.9 Package eu.tclouds.cheapbft.system.core

Classes

- class [CheapConsensusMgr](#)
- class [CheapServiceFactory](#)
- class [UpdateMgr](#)

4.10 Package eu.tclouds.cheapbft.system.messages

Classes

- class [CheapMessage](#)
- class [CheckpointMessage](#)
- class [CheckpointRequestMessage](#)
- class [CommitMessage](#)
- class [MessageCertificate](#)
- class [MessageHasher](#)
- class [MessagePart](#)
- class [MessagePartHasher](#)
- class [PrepareMessage](#)
- class [ReplicaStateUpdate](#)
- class [SimpleMessagePart](#)
- class [SwitchMessage](#)
- class [UpdateContainerMessage](#)
- class [UpdateMessage](#)

4.11 Package eu.tclouds.cheapbft.system.minbft

Classes

- class [MinBFT](#)
- class [MinBFTConsensusMngr](#)
- class [MINServiceFactory](#)

4.12 Package eu.tclouds.cheapbft.util

Classes

- class [AbstractQueueMap< K, E >](#)
- class [ArraysHelper](#)
- class [QueueMap< K, E >](#)

4.13 Package eu.tclouds.tubs

Packages

- package [util](#)

4.14 Package eu.tclouds.tubs.util

Packages

- package [hash](#)

Classes

- class [ArgumentNullException](#)
- class [Convert](#)
- class [DateHelper](#)
- class [ExceptionHandler](#)
- class [MeasurementResult](#)
- class [PerformanceCounter](#)
- class [PerformanceLogger](#)
- class [PlainFormatter](#)
- class [Profiler](#)
- class [StackTrace](#)

4.15 Package eu.tclouds.tubs.util.hash

Classes

- interface [Hashable](#)
- class [HashableBase](#)
- class [HashableHasherPool](#)
- class [HasherPool< T >](#)

4.16 Package navigators

Packages

- package [smart](#)

4.17 Package navigators.smart

Packages

- package [clientsmanagement](#)
- package [com](#)
- package [communication](#)
- package [consensus](#)
- package [demo](#)
- package [paxosatwar](#)
- package [service](#)
- package [statemanagement](#)
- package [tests](#)
- package [tom](#)
- package [util](#)

4.18 Package navigators.smart.clientsmanagement

Classes

- class [ClientData](#)
- interface [ClientRequestListener](#)
- class [ClientsManager](#)
- class [PendingRequests](#)

4.18.1 Detailed Description

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4.19 Package navigators.smart.com

Packages

- package [service](#)
- package [system](#)

Classes

- interface [ComConfiguration](#)
- interface [ComMessage](#)
- interface [ComMessageSender](#)

4.20 Package navigators.smart.com.service

Packages

- package [netty](#)

Classes

- interface [ReplyReceiver](#)
- interface [RequestReceiver](#)
- interface [ServiceCommunicationClient](#)
- class [ServiceCommunicationClientFactory](#)
- interface [ServiceCommunicationServer](#)
- class [ServiceCommunicationServerFactory](#)

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4.21 Package navigators.smart.com.service.netty

Classes

- class [NettyClientPipelineFactory](#)

- class [NettyClientServerSession](#)
- class [NettyServerPipelineFactory](#)
- class [NettyServiceCommunicationServer](#)
- class [NettyServiceCommunicationClient](#)
- class [NettyTOMMessageDecoder](#)
- class [NettyTOMMessageEncoder](#)

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4.22 Package navigators.smart.com.system

Classes

- class [ServerConnection](#)
- class [SystemCommunication](#)
- interface [SystemMessageReceiver](#)
- interface [SystemMessageReceiverFactory](#)

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4.23 Package navigators.smart.communication

Packages

- package [server](#)

4.24 Package navigators.smart.communication.server

Classes

- class [Test](#)
- class [TestSerialization](#)

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4.25 Package navigators.smart.consensus

Classes

- class [ComMessageHub< S extends ConsensusService >](#)
- class [Consensus< E >](#)
- interface [ConsensusService](#)
- interface [ConsensusServiceFactory](#)
- class [MeasuringConsensus< E >](#)

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4.26 Package navigators.smart.demo

Classes

- class [CounterClient](#)
- class [CounterClientExt](#)
- class [CounterServer](#)
- class [LatencyTestClient](#)
- class [LatencyTestServer](#)
- class [LatencyTestServerReplica0](#)
- class [RandomClient](#)
- class [RandomServer](#)
- class [ThroughputTestClient](#)
- class [ThroughputTestServer](#)

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4.27 Package navigators.smart.paxosatwar

Packages

- package [executionmanager](#)
- package [messages](#)
- package [requesthandler](#)
- package [roles](#)

Classes

- class [PaxosAtWarService](#)
- class [PaxosAtWarServiceFactory](#)

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4.28 Package `navigators.smart.paxosatwar.executionmanager`

Classes

- class [Execution](#)
- class [ExecutionManager](#)
- class [LeaderModule](#)
- class [ProofVerifier](#)
- class [Round](#)
- class [TimeoutTask](#)
- class [ExecutionManagerTest](#)

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4.29 Package navigators.smart.paxosatwar.messages

Classes

- class [Collect](#)
- class [CollectProof](#)
- class [FreezeProof](#)
- class [HMacVerifier](#)
- class [HMacVerifierFactory](#)
- class [MessageFactory](#)
- interface [MessageVerifier](#)
- interface [MessageVerifierFactory](#)
- class [PaWMessageHandler](#)
- class [PaxosMessage](#)
- class [Proof](#)
- class [Propose](#)
- class [VoteMessage](#)
- class [PaxosMessageTest](#)

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4.30 Package navigators.smart.paxosatwar.requesthandler

Packages

- package [timer](#)

Classes

- class [OutOfContextMessageThread](#)
- class [RequestHandler](#)

4.30.1 Detailed Description

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4.31 Package navigators.smart.paxosatwar.requesthandler.timer

Classes

- class [RequestsTimer](#)
- class [RTInfo](#)

4.31.1 Detailed Description

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4.32 Package navigators.smart.paxosatwar.roles

Classes

- class [Acceptor](#)
- class [Proposer](#)

4.32.1 Detailed Description

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4.33 Package navigators.smart.service

Classes

- interface [HashableData](#)
- interface [ServiceCheckpoint](#)
- interface [ServiceProxy](#)
- interface [ServiceReplica](#)
- interface [ServiceReply](#)
- interface [ServiceRequest](#)
- class [ServiceResult](#)
- interface [ServiceStateUpdate](#)
- class [SimpleServiceCheckpoint](#)
- class [SimpleServiceData](#)
- class [SimpleServiceReply](#)
- class [SimpleServiceStateUpdate](#)
- class [SingleThreadedServiceReplica](#)
- class [StandardServiceProxy](#)

4.33.1 Detailed Description

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4.34 Package navigators.smart.statemanagment

Classes

- class [ApplicationState](#)
- class [BatchInfo](#)
- class [SMMessage](#)
- class [StateLog](#)
- class [StateManager](#)
- class [TransferableState](#)

4.34.1 Detailed Description

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4.35 Package navigators.smart.tests

Packages

- package [util](#)

4.36 Package navigators.smart.tests.util

Classes

- class [TestHelper](#)

4.37 Package navigators.smart.tom

Packages

- package [core](#)
- package [demo](#)
- package [messages](#)
- package [timer](#)
- package [util](#)

Classes

- class [DeliveryThread](#)
- class [RequestRecover](#)
- class [TOMLayer](#)
- class [TOMMessageHandler](#)

4.37.1 Detailed Description

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4.38 Package navigators.smart.tom.core

Packages

- package [messages](#)

Classes

- class [TOMLayerTest](#)

4.39 Package navigators.smart.tom.core.messages

Classes

- class [TOMMessageTest](#)

4.40 Package navigators.smart.tom.demo

Classes

- class [AllinOneTest](#)
- class [ThroughputLatencyTestClient](#)
- class [ThroughputLatencyTestServer](#)

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4.41 Package navigators.smart.tom.messages

Classes

- class [BlobMessagePart](#)
- class [ByteBufferMessageSink](#)
- class [ExtMessageDigest](#)
- class [MessageBuilder](#)
- interface [MessagePart](#)
- interface [MessageSink](#)
- class [RequestRecoveryMessage](#)
- class [SmartMessage](#)
- class [TOMMessage](#)

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4.42 Package navigators.smart.tom.timer

Packages

- package [messages](#)

4.43 Package navigators.smart.tom.timer.messages

Classes

- class [ForwardedMessage](#)
- class [RTCollect](#)
- class [RTLeaderChange](#)
- class [RTMessage](#)

4.43.1 Detailed Description

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4.44 Package navigators.smart.tom.util

Classes

- class [BatchBuilder](#)
- class [BatchReader](#)
- class [Configuration](#)
- class [DebugInfo](#)
- class [FileIO](#)
- class [FileLocker](#)
- class [HostsConfig](#)
- class [JavaSpin](#)
- class [Logger](#)
- class [ReceivedMessage](#)
- class [RSAKeyLoader](#)
- class [RSAKeyPairGenerator](#)
- class [SerialisationHelper](#)
- class [ShutdownThread](#)
- class [Storage](#)
- class [TOMConfiguration](#)
- class [TOMUtil](#)
- class [BatchBuilderReaderTest](#)

4.44.1 Detailed Description

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4.45 Package navigators.smart.util

Classes

- class [ConfigurationException](#)

4.46 Package tclouds

Packages

- package [pol](#)

4.47 Package tclouds.pol

Packages

- package [logservice](#)

4.48 Package tclouds.pol.logservice

Packages

- package [commons](#)
- package [demo](#)
- package [logstorage](#)

4.49 Package tclouds.pol.logservice.commons

Packages

- package [json](#)

Classes

- class [CheapBFT](#)
- class [JSONData](#)
- interface [StorageDriver](#)

4.50 Package tclouds.pol.logservice.common.json

Classes

- interface [JSONData](#)
- class [JSONList](#)
- class [JSONListResult](#)
- class [JSONRetrieve](#)
- class [JSONRetrieveResult](#)
- class [JSONStore](#)

4.51 Package tclouds.pol.logservice.demo

Classes

- class [LogClient](#)
- class [LogProxy](#)
- class [LogRequest](#)
- class [LogServer](#)

4.51.1 Detailed Description

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4.52 Package tclouds.pol.logservice.logstorage

Packages

- package [servlet](#)

4.53 Package tclouds.pol.logservice.logstorage.servlet

Classes

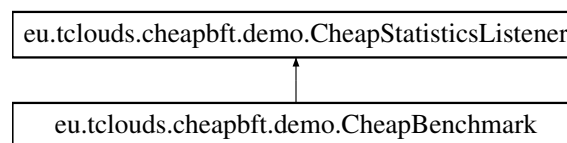
- class [LogStorage](#)

Chapter 5

Class Documentation

5.1 eu.tclouds.cheapbft.demo.CheapBenchmark Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.CheapBenchmark:



Public Member Functions

- [CheapBenchmark](#) ()
- void [runBenchmark](#) (long duration, int nrOfClients, Class<?extends [CheapBenchmarkClient](#) > benchmarkType, String[] args)
- void [statisticsIntervalResult](#) (int resultIndex, int eventCount, float eventValueAverage)
- void [statisticsProgressResult](#) (int eventCount)
- void [statisticsOverallResult](#) (int nrOfIntervalls, int eventCount, float eventCountAverage, float eventValueAverage)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Static Public Attributes

- static final boolean [ENABLE_WARMUP](#) = false
- static [CheapIntervalStatistics](#) statistics
- static Semaphore [startLock](#)

5.1.1 Constructor & Destructor Documentation

5.1.1.1 eu.tclouds.cheapbft.demo.CheapBenchmark.CheapBenchmark ()

5.1.2 Member Function Documentation

- 5.1.2.1 `static void eu.tclouds.cheapbft.demo.CheapBenchmark.main (String[] args) throws Exception` [static]
- 5.1.2.2 `void eu.tclouds.cheapbft.demo.CheapBenchmark.runBenchmark (long duration, int nrOfClients, Class<? extends CheapBenchmarkClient > benchmarkType, String[] args)`
- 5.1.2.3 `void eu.tclouds.cheapbft.demo.CheapBenchmark.statisticsIntervalResult (int resultIndex, int eventCount, float eventValueAverage)`

Implements [eu.tclouds.cheapbft.demo.CheapStatisticsListener](#).

- 5.1.2.4 `void eu.tclouds.cheapbft.demo.CheapBenchmark.statisticsOverallResult (int nrOfIntervals, int eventCount, float eventCountAverage, float eventValueAverage)`

Implements [eu.tclouds.cheapbft.demo.CheapStatisticsListener](#).

- 5.1.2.5 `void eu.tclouds.cheapbft.demo.CheapBenchmark.statisticsProgressResult (int eventCount)`

Implements [eu.tclouds.cheapbft.demo.CheapStatisticsListener](#).

5.1.3 Member Data Documentation

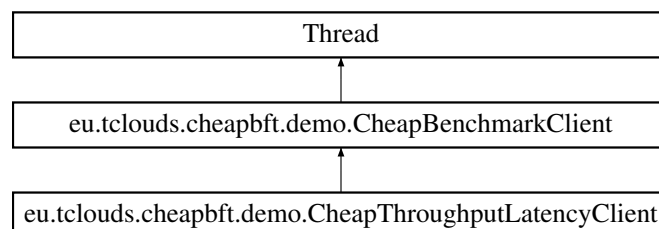
- 5.1.3.1 `final boolean eu.tclouds.cheapbft.demo.CheapBenchmark.ENABLE_WARMUP = false` [static]
- 5.1.3.2 `Semaphore eu.tclouds.cheapbft.demo.CheapBenchmark.startLock` [static]
- 5.1.3.3 `CheapIntervalStatistics eu.tclouds.cheapbft.demo.CheapBenchmark.statistics` [static]

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

- `cheap/src/eu/tclouds/cheapbft/demo/CheapBenchmark.java`

5.2 eu.tclouds.cheapbft.demo.CheapBenchmarkClient Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.CheapBenchmarkClient`:



Public Member Functions

- [CheapBenchmarkClient](#) (short id)
- `void run ()`

Protected Member Functions

- abstract void [work](#) () throws Exception
- void [cleanup](#) ()

Protected Attributes

- final short [id](#)

5.2.1 Constructor & Destructor Documentation

5.2.1.1 [eu.tclouds.cheapbft.demo.CheapBenchmarkClient.CheapBenchmarkClient](#) (short *id*)

5.2.2 Member Function Documentation

5.2.2.1 void [eu.tclouds.cheapbft.demo.CheapBenchmarkClient.cleanup](#) () [protected]

5.2.2.2 void [eu.tclouds.cheapbft.demo.CheapBenchmarkClient.run](#) ()

5.2.2.3 abstract void [eu.tclouds.cheapbft.demo.CheapBenchmarkClient.work](#) () throws Exception [protected],
[pure virtual]

Implemented in [eu.tclouds.cheapbft.demo.CheapThroughputLatencyClient](#).

5.2.3 Member Data Documentation

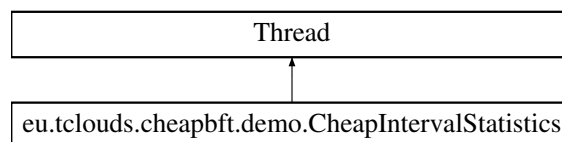
5.2.3.1 final short [eu.tclouds.cheapbft.demo.CheapBenchmarkClient.id](#) [protected]

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

- [cheap/src/eu/tclouds/cheapbft/demo/CheapBenchmarkClient.java](#)

5.3 eu.tclouds.cheapbft.demo.CheapIntervalStatistics Class Reference

Inheritance diagram for [eu.tclouds.cheapbft.demo.CheapIntervalStatistics](#):



Public Member Functions

- [CheapIntervalStatistics](#) (int interval, [CheapStatisticsListener](#) listener)
- void [reset](#) ()
- void [run](#) ()
- synchronized void [end](#) ()
- synchronized void [event](#) (long value)

5.3.1 Constructor & Destructor Documentation

5.3.1.1 `eu.tclouds.cheapbft.demo.CheapIntervalStatistics.CheapIntervalStatistics (int interval, CheapStatisticsListener listener)`

5.3.2 Member Function Documentation

5.3.2.1 `synchronized void eu.tclouds.cheapbft.demo.CheapIntervalStatistics.end ()`

5.3.2.2 `synchronized void eu.tclouds.cheapbft.demo.CheapIntervalStatistics.event (long value)`

5.3.2.3 `void eu.tclouds.cheapbft.demo.CheapIntervalStatistics.reset ()`

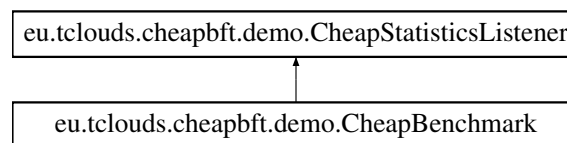
5.3.2.4 `void eu.tclouds.cheapbft.demo.CheapIntervalStatistics.run ()`

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

- `cheap/src/eu/tclouds/cheapbft/demo/CheapIntervalStatistics.java`

5.4 eu.tclouds.cheapbft.demo.CheapStatisticsListener Interface Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.CheapStatisticsListener`:



Public Member Functions

- void [statisticsIntervalResult](#) (int *resultIndex*, int *eventCount*, float *eventValueAverage*)
- void [statisticsProgressResult](#) (int *eventCount*)
- void [statisticsOverallResult](#) (int *nrOfIntervals*, int *eventCount*, float *eventCountAverage*, float *eventValueAverage*)

5.4.1 Member Function Documentation

5.4.1.1 `void eu.tclouds.cheapbft.demo.CheapStatisticsListener.statisticsIntervalResult (int resultIndex, int eventCount, float eventValueAverage)`

Implemented in [eu.tclouds.cheapbft.demo.CheapBenchmark](#).

5.4.1.2 `void eu.tclouds.cheapbft.demo.CheapStatisticsListener.statisticsOverallResult (int nrOfIntervals, int eventCount, float eventCountAverage, float eventValueAverage)`

Implemented in [eu.tclouds.cheapbft.demo.CheapBenchmark](#).

5.4.1.3 `void eu.tclouds.cheapbft.demo.CheapStatisticsListener.statisticsProgressResult (int eventCount)`

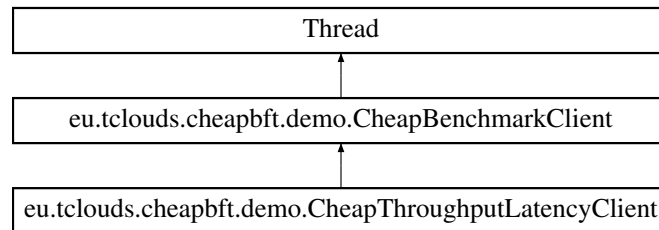
Implemented in [eu.tclouds.cheapbft.demo.CheapBenchmark](#).

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

- [cheap/src/eu/tclouds/cheapbft/demo/CheapStatisticsListener.java](#)

5.5 eu.tclouds.cheapbft.demo.CheapThroughputLatencyClient Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.CheapThroughputLatencyClient:



Public Member Functions

- [CheapThroughputLatencyClient](#) (short *id*, String[] args)

Protected Member Functions

- void [work](#) () throws Exception

Additional Inherited Members

5.5.1 Constructor & Destructor Documentation

5.5.1.1 eu.tclouds.cheapbft.demo.CheapThroughputLatencyClient.CheapThroughputLatencyClient (short *id*, String[] *args*)

5.5.2 Member Function Documentation

5.5.2.1 void eu.tclouds.cheapbft.demo.CheapThroughputLatencyClient.work () throws Exception [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.CheapBenchmarkClient](#).

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

- [cheap/src/eu/tclouds/cheapbft/demo/CheapThroughputLatencyClient.java](#)

5.6 eu.tclouds.cheapbft.demo.Configuration Class Reference

Static Public Member Functions

- static int [getInt](#) (String prop, int def) throws ConfigurationException

5.6.1 Member Function Documentation

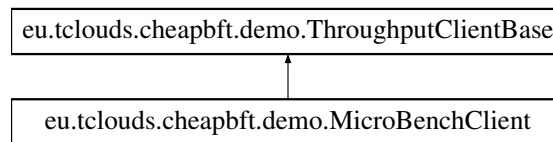
5.6.1.1 static int eu.tclouds.cheapbft.demo.Configuration.getInt (String *prop*, int *def*) throws ConfigurationException [static]

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

- [cheap/src/eu/tclouds/cheapbft/demo/Configuration.java](#)

5.7 eu.tclouds.cheapbft.demo.MicroBenchClient Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.MicroBenchClient:



Public Member Functions

- [MicroBenchClient](#) (int startid) throws IOException, ConfigurationException

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- String [getPropsNamespace](#) ()
- [TestRun createTestRun](#) (int nworker, int secs)
- [Worker createWorker](#) ([StandardServiceProxy](#) proxy, CountDownLatch startsignal)

Additional Inherited Members

5.7.1 Constructor & Destructor Documentation

5.7.1.1 [eu.tclouds.cheapbft.demo.MicroBenchClient.MicroBenchClient](#) (int *startid*) throws IOException, ConfigurationException

5.7.2 Member Function Documentation

5.7.2.1 [TestRun eu.tclouds.cheapbft.demo.MicroBenchClient.createTestRun](#) (int *nworker*, int *secs*) [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

5.7.2.2 [Worker eu.tclouds.cheapbft.demo.MicroBenchClient.createWorker](#) ([StandardServiceProxy](#) *proxy*, CountDownLatch *startsignal*) [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

5.7.2.3 [String eu.tclouds.cheapbft.demo.MicroBenchClient.getPropsNamespace](#) () [protected]

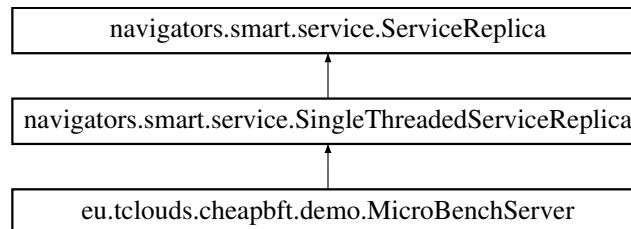
5.7.2.4 [static void eu.tclouds.cheapbft.demo.MicroBenchClient.main](#) (String[] *args*) throws Exception [static]

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

- [cheap/src/eu/tclouds/cheapbft/demo/MicroBenchClient.java](#)

5.8 eu.tclouds.cheapbft.demo.MicroBenchServer Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.MicroBenchServer:



Public Member Functions

- [MicroBenchServer](#) (int id) throws ConfigurationException
- void [start](#) () throws IOException, InterruptedException

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceResult executeCommand](#) (int clientid, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)
- synchronized [ServiceCheckpoint createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)

Additional Inherited Members

5.8.1 Constructor & Destructor Documentation

5.8.1.1 eu.tclouds.cheapbft.demo.MicroBenchServer.MicroBenchServer (int *id*) throws ConfigurationException

5.8.2 Member Function Documentation

5.8.2.1 void eu.tclouds.cheapbft.demo.MicroBenchServer.applyUpdate ([ServiceStateUpdate](#) *update*) [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.8.2.2 synchronized [ServiceCheckpoint](#) eu.tclouds.cheapbft.demo.MicroBenchServer.createCheckpoint () [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.8.2.3 `ServiceResult eu.tclouds.cheapbft.demo.MicroBenchServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` `[protected]`, `[virtual]`

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.8.2.4 `void eu.tclouds.cheapbft.demo.MicroBenchServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.8.2.5 `static void eu.tclouds.cheapbft.demo.MicroBenchServer.main (String[] args)` throws `Exception` `[static]`

5.8.2.6 `void eu.tclouds.cheapbft.demo.MicroBenchServer.start ()` throws `IOException`, `InterruptedException`

Implements [navigators.smart.service.ServiceReplica](#).

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

- `cheap/src/eu/tclouds/cheapbft/demo/MicroBenchServer.java`

5.9 eu.tclouds.cheapbft.demo.ReplicaMonitor Class Reference

Public Member Functions

- [ReplicaMonitor](#) ([SingleThreadedServiceReplica](#) replica, [CheapService](#) service, int interval, File outfile)
- void [start](#) ()

5.9.1 Constructor & Destructor Documentation

5.9.1.1 `eu.tclouds.cheapbft.demo.ReplicaMonitor.ReplicaMonitor (SingleThreadedServiceReplica replica, CheapService service, int interval, File outfile)`

5.9.2 Member Function Documentation

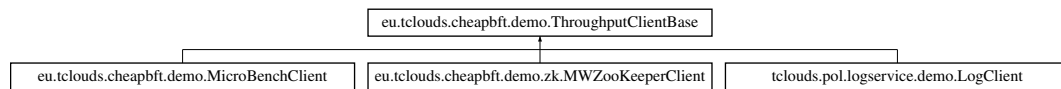
5.9.2.1 `void eu.tclouds.cheapbft.demo.ReplicaMonitor.start ()`

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

- `cheap/src/eu/tclouds/cheapbft/demo/ReplicaMonitor.java`

5.10 eu.tclouds.cheapbft.demo.ThroughputClientBase Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.ThroughputClientBase:



Classes

- class [TestRun](#)
- class [Worker](#)

Public Member Functions

- [ThroughputClientBase](#) (int startid) throws IOException, ConfigurationException
- void [run](#) () throws Exception
- int [getWarmupTime](#) ()
- int [getRunTime](#) ()
- int [getPause](#) ()

Protected Member Functions

- void [startWarmup](#) (int nworker, int secs) throws Exception
- void [startTestRuns](#) (int nworker, int secs) throws Exception
- int [getIntProp](#) (String name, int def) throws ConfigurationException
- String [getFullPropName](#) (String name)
- String [getPropsNamespace](#) ()
- abstract [TestRun](#) [createTestRun](#) (int nworker, int secs)
- abstract [Worker](#) [createWorker](#) ([StandardServiceProxy](#) proxy, CountDownLatch startsignal)
- synchronized void [initTPTest](#) (int nclients)
- synchronized void [onClientStarted](#) ()
- synchronized void [onRequest](#) (long t)
- synchronized void [onClientFinished](#) ()

Protected Attributes

- [StandardServiceProxy](#)[] [m_proxies](#)
- AtomicBoolean [m_isrunning](#) = new AtomicBoolean()

5.10.1 Constructor & Destructor Documentation

- 5.10.1.1 `eu.tclouds.cheapbft.demo.ThroughputClientBase.ThroughputClientBase (int startid)` throws IOException, ConfigurationException

5.10.2 Member Function Documentation

5.10.2.1 **abstract TestRun** eu.tclouds.cheapbft.demo.ThroughputClientBase.createTestRun (int *nworker*, int *secs*)
[protected],[pure virtual]

Implemented in [tclouds.pol.logservice.demo.LogClient](#), [eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient](#), and [eu.-tclouds.cheapbft.demo.MicroBenchClient](#).

5.10.2.2 **abstract Worker** eu.tclouds.cheapbft.demo.ThroughputClientBase.createWorker (**StandardServiceProxy** *proxy*,
CountDownLatch *startsignal*) [protected],[pure virtual]

Implemented in [tclouds.pol.logservice.demo.LogClient](#), [eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient](#), and [eu.-tclouds.cheapbft.demo.MicroBenchClient](#).

5.10.2.3 **String** eu.tclouds.cheapbft.demo.ThroughputClientBase.getFullPropName (**String** *name*) [protected]

5.10.2.4 **int** eu.tclouds.cheapbft.demo.ThroughputClientBase.getIntProp (**String** *name*, **int** *def*) throws
ConfigurationException [protected]

5.10.2.5 **int** eu.tclouds.cheapbft.demo.ThroughputClientBase.getPause ()

5.10.2.6 **String** eu.tclouds.cheapbft.demo.ThroughputClientBase.getPropsNamespace () [protected]

5.10.2.7 **int** eu.tclouds.cheapbft.demo.ThroughputClientBase.getRuntime ()

5.10.2.8 **int** eu.tclouds.cheapbft.demo.ThroughputClientBase.getWarmupTime ()

5.10.2.9 **synchronized void** eu.tclouds.cheapbft.demo.ThroughputClientBase.initTPTest (**int** *nclients*) [protected]

5.10.2.10 **synchronized void** eu.tclouds.cheapbft.demo.ThroughputClientBase.onClientFinished () [protected]

5.10.2.11 **synchronized void** eu.tclouds.cheapbft.demo.ThroughputClientBase.onClientStarted () [protected]

5.10.2.12 **synchronized void** eu.tclouds.cheapbft.demo.ThroughputClientBase.onRequest (**long** *t*) [protected]

5.10.2.13 **void** eu.tclouds.cheapbft.demo.ThroughputClientBase.run () throws **Exception**

5.10.2.14 **void** eu.tclouds.cheapbft.demo.ThroughputClientBase.startTestRuns (**int** *nworker*, **int** *secs*) throws **Exception**
[protected]

5.10.2.15 **void** eu.tclouds.cheapbft.demo.ThroughputClientBase.startWarmup (**int** *nworker*, **int** *secs*) throws **Exception**
[protected]

5.10.3 Member Data Documentation

5.10.3.1 **AtomicBoolean** eu.tclouds.cheapbft.demo.ThroughputClientBase.m_isrunning = new **AtomicBoolean**()
[protected]

5.10.3.2 **StandardServiceProxy** [] eu.tclouds.cheapbft.demo.ThroughputClientBase.m_proxies [protected]

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

- cheap/src/eu/tclouds/cheapbft/demo/ThroughputClientBase.java

5.11 eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun Class Reference

Inherited by eu.tclouds.cheapbft.demo.MicroBenchClient.MicroTestRun, eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKTestRun, and tclouds.pol.logservice.demo.LogClient.LogTestRun.

Public Member Functions

- [TestRun](#) (int nworker, int secs)
- final void [start](#) () throws Exception
- int [getNumberOfWorker](#) ()
- int [getSeconds](#) ()

Protected Member Functions

- void [onStart](#) ()
- void [onFinish](#) ([Worker](#)[] worker, long totaltime, int tp, long rectime, [MeasurementResult](#) reqres, [PrintWriter](#) outres) throws Exception

5.11.1 Constructor & Destructor Documentation

5.11.1.1 eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.TestRun (int *nworker*, int *secs*)

5.11.2 Member Function Documentation

5.11.2.1 int eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.getNumberOfWorker ()

5.11.2.2 int eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.getSeconds ()

5.11.2.3 void eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.onFinish ([Worker](#)[] *worker*, long *totaltime*, int *tp*, long *rectime*, [MeasurementResult](#) *reqres*, [PrintWriter](#) *outres*) throws Exception [protected]

5.11.2.4 void eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.onStart () [protected]

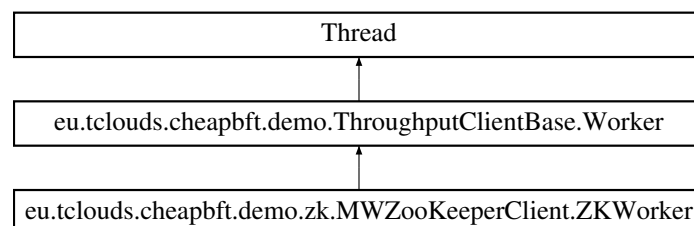
5.11.2.5 final void eu.tclouds.cheapbft.demo.ThroughputClientBase.TestRun.start () throws Exception

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

- cheap/src/eu/tclouds/cheapbft/demo/ThroughputClientBase.java

5.12 eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker:



Public Member Functions

- [Worker](#) ([StandardServiceProxy](#) proxy, [CountDownLatch](#) startsignal)
- final void [run](#) ()
- Exception [getException](#) ()

Protected Member Functions

- final [StandardServiceProxy](#) [getProxy](#) ()
- void [beforeStart](#) ()
- void [beforeInvocation](#) () throws Exception
- abstract void [invokeService](#) () throws Exception
- void [afterInvocation](#) (long time) throws Exception

5.12.1 Constructor & Destructor Documentation

- 5.12.1.1 [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.Worker](#) ([StandardServiceProxy](#) proxy, [CountDownLatch](#) startsignal)

5.12.2 Member Function Documentation

- 5.12.2.1 void [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.afterInvocation](#) (long time) throws Exception
[protected]
- 5.12.2.2 void [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.beforeInvocation](#) () throws Exception
[protected]
- 5.12.2.3 void [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.beforeStart](#) () [protected]
- 5.12.2.4 Exception [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.getException](#) ()
- 5.12.2.5 final [StandardServiceProxy](#) [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.getProxy](#) ()
[protected]
- 5.12.2.6 abstract void [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.invokeService](#) () throws Exception
[protected], [pure virtual]

Implemented in [eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker](#).

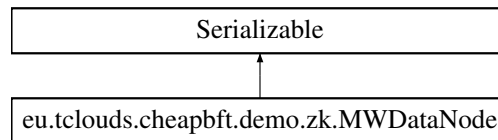
- 5.12.2.7 final void [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker.run](#) ()

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

- cheap/src/eu/tclouds/cheapbft/demo/ThroughputClientBase.java

5.13 eu.tclouds.cheapbft.demo.zk.MWDataNode Class Reference

Inheritance diagram for [eu.tclouds.cheapbft.demo.zk.MWDataNode](#):



Public Member Functions

- [MWDataNode](#) ([MWStat](#) stat)
- int [getIndex](#) ()
- [MWStat](#) [getStat](#) ()
- byte[] [getData](#) ()
- void [setData](#) (byte[] data)

5.13.1 Constructor & Destructor Documentation

5.13.1.1 eu.tclouds.cheapbft.demo.zk.MWDataNode.MWDataNode ([MWStat](#) stat)

5.13.2 Member Function Documentation

5.13.2.1 byte [] eu.tclouds.cheapbft.demo.zk.MWDataNode.getData ()

5.13.2.2 int eu.tclouds.cheapbft.demo.zk.MWDataNode.getIndex ()

5.13.2.3 [MWStat](#) eu.tclouds.cheapbft.demo.zk.MWDataNode.getStat ()

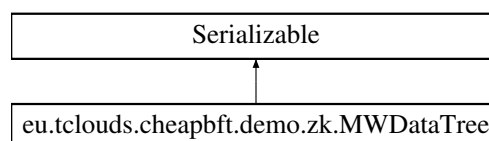
5.13.2.4 void eu.tclouds.cheapbft.demo.zk.MWDataNode.setData (byte[] data)

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

- cheap/src/eu/tclouds/cheapbft/demo/zk/MWDataNode.java

5.14 eu.tclouds.cheapbft.demo.zk.MWDataTree Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.zk.MWDataTree:



Public Member Functions

- [MWDataTree](#) ()
- String [getPathByIndex](#) (int index)
- [MWDataNode](#) [getNode](#) (String path, int version) throws [MWZooKeeperException](#)
- String [create](#) (String path, byte[] data, long time, long ephemeralOwner) throws [MWZooKeeperException](#)
- void [delete](#) (String path, int version) throws [MWZooKeeperException](#)
- [MWStat](#) [setData](#) (String path, byte[] data, int version, long time) throws [MWZooKeeperException](#)
- byte[] [getData](#) (String path, [MWStat](#) stat) throws [MWZooKeeperException](#)
- void [killSession](#) (long ephemeralOwner) throws [MWZooKeeperException](#)

5.14.1 Constructor & Destructor Documentation

5.14.1.1 `eu.tclouds.cheapbft.demo.zk.MWDataTree.MWDataTree ()`

5.14.2 Member Function Documentation

5.14.2.1 `String eu.tclouds.cheapbft.demo.zk.MWDataTree.create (String path, byte[] data, long time, long ephemeralOwner)` throws `MWZooKeeperException`

5.14.2.2 `void eu.tclouds.cheapbft.demo.zk.MWDataTree.delete (String path, int version)` throws `MWZooKeeperException`

5.14.2.3 `byte [] eu.tclouds.cheapbft.demo.zk.MWDataTree.getData (String path, MWStat stat)` throws `MWZooKeeperException`

5.14.2.4 `MWDataNode eu.tclouds.cheapbft.demo.zk.MWDataTree.getNode (String path, int version)` throws `MWZooKeeperException`

5.14.2.5 `String eu.tclouds.cheapbft.demo.zk.MWDataTree.getPathByIndex (int index)`

5.14.2.6 `void eu.tclouds.cheapbft.demo.zk.MWDataTree.killSession (long ephemeralOwner)` throws `MWZooKeeperException`

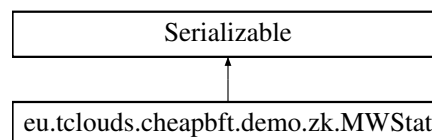
5.14.2.7 `MWStat eu.tclouds.cheapbft.demo.zk.MWDataTree.setData (String path, byte[] data, int version, long time)` throws `MWZooKeeperException`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWDataTree.java`

5.15 eu.tclouds.cheapbft.demo.zk.MWStat Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.zk.MWStat`:



Public Member Functions

- `MWStat ()`
- `MWStat (int version, long ephemeralOwner)`
- `int getVersion ()`
- `void setVersion (int version)`
- `long getLastModified ()`
- `void setLastModified (long lastModified)`
- `long getEphemeralOwner ()`
- `void setEphemeralOwner (long ephemeralOwner)`

Static Public Member Functions

- `static void copy (MWStat sourcStat, MWStat destinationStat)`

5.16.2 Member Function Documentation

5.16.2.1 `String eu.tclouds.cheapbft.demo.zk.MWZooKeeper.create (String path, byte[] data, boolean ephemeral)` throws `MWZooKeeperException`

5.16.2.2 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeper.delete (String path, int version)` throws `MWZooKeeperException`

5.16.2.3 `byte [] eu.tclouds.cheapbft.demo.zk.MWZooKeeper.getData (String path, MWStat stat)` throws `MWZooKeeperException`

5.16.2.4 `ServiceProxy eu.tclouds.cheapbft.demo.zk.MWZooKeeper.getProxy ()`

5.16.2.5 `boolean eu.tclouds.cheapbft.demo.zk.MWZooKeeper.getRequestOnly ()`

5.16.2.6 `MWStat eu.tclouds.cheapbft.demo.zk.MWZooKeeper.setData (String path, byte[] data, int version)` throws `MWZooKeeperException`

5.16.2.7 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeper.setRequestOnly (boolean value)`

5.16.3 Member Data Documentation

5.16.3.1 `final String eu.tclouds.cheapbft.demo.zk.MWZooKeeper.NODE_BASE = "/cheap-xxx"` `[static]`

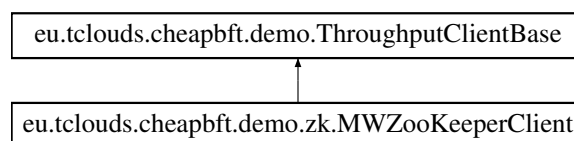
5.16.3.2 `final boolean eu.tclouds.cheapbft.demo.zk.MWZooKeeper.ZIP_PAYLOAD = false` `[static]`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zh/MWZooKeeper.java`

5.17 eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient`:



Classes

- class [Results](#)
- class [ZKWorker](#)

Public Member Functions

- [MWZooKeeperClient](#) (int startid) throws `IOException`, `ConfigurationException`

Static Public Member Functions

- static void [main](#) (String[] args) throws `Exception`

Static Public Attributes

- static final byte[] [DATA_SEED](#)

Protected Member Functions

- String [getPropsNamespace](#) ()
- [TestRun createTestRun](#) (int nworker, int secs)
- [Worker createWorker](#) ([StandardServiceProxy](#) proxy, [CountDownLatch](#) startsignal)
- void [startWarmup](#) (int nworker, int secs) throws Exception
- void [startTestRuns](#) (int nworker, int secs) throws Exception

Additional Inherited Members

5.17.1 Constructor & Destructor Documentation

- 5.17.1.1 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.MWZooKeeperClient](#) (int *startid*) throws [IOException](#), [ConfigurationException](#)

5.17.2 Member Function Documentation

- 5.17.2.1 [TestRun eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.createTestRun](#) (int *nworker*, int *secs*)
[protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

- 5.17.2.2 [Worker eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.createWorker](#) ([StandardServiceProxy](#) *proxy*, [CountDownLatch](#) *startsignal*) [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

- 5.17.2.3 [String eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.getPropsNamespace](#) () [protected]

- 5.17.2.4 [static void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.main](#) ([String\[\]](#) *args*) throws [Exception](#) [static]

- 5.17.2.5 [void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.startTestRuns](#) (int *nworker*, int *secs*) throws [Exception](#)
[protected]

- 5.17.2.6 [void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.startWarmup](#) (int *nworker*, int *secs*) throws [Exception](#)
[protected]

5.17.3 Member Data Documentation

- 5.17.3.1 [final byte \[\] eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.DATA_SEED](#) [static]

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

- cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperClient.java

5.18 eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results Class Reference

Public Member Functions

- void [add](#) (int idx, long t)
- void [add](#) ([Results](#) r)
- void [print](#) ()
- void [write](#) (PrintWriter out)
- void [setTotal](#) (long value)
- void [setThroughput](#) (int value)
- void [reset](#) ()

5.18.1 Member Function Documentation

5.18.1.1 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.add (int *idx*, long *t*)

5.18.1.2 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.add ([Results](#) *r*)

5.18.1.3 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.print ()

5.18.1.4 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.reset ()

5.18.1.5 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.setThroughput (int *value*)

5.18.1.6 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.setTotal (long *value*)

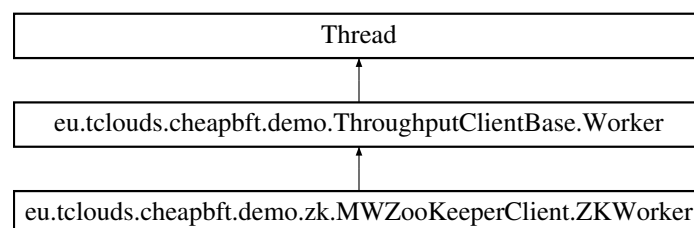
5.18.1.7 void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.Results.write ([PrintWriter](#) *out*)

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

- cheap/src/eu/tclouds/cheapbft/demo/zh/MWZooKeeperClient.java

5.19 eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker:



Public Member Functions

- [ZKWorker](#) ([StandardServiceProxy](#) proxy, CountDownLatch startsignal, int writerate)
- [Results](#) [getResults](#) () throws IOException, MWZooKeeperException

Protected Member Functions

- void [beforeInvocation](#) ()
- void [invokeService](#) () throws Exception
- void [afterInvocation](#) (long time)

5.19.1 Constructor & Destructor Documentation

5.19.1.1 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker.ZKWorker (StandardServiceProxy proxy, CountDownLatch startsignal, int writerate)`

5.19.2 Member Function Documentation

5.19.2.1 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker.afterInvocation (long time)` `[protected]`

5.19.2.2 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker.beforeInvocation ()` `[protected]`

5.19.2.3 **Results** `eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker.getResults ()` throws `IOException`, `MWZooKeeperException`

5.19.2.4 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperClient.ZKWorker.invokeService ()` throws `Exception` `[protected]`, `[virtual]`

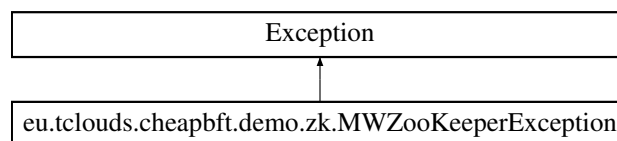
Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase.Worker](#).

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperClient.java`

5.20 eu.tclouds.cheapbft.demo.zk.MWZooKeeperException Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.zk.MWZooKeeperException`:



Public Member Functions

- [MWZooKeeperException](#) (String message)
- [MWZooKeeperException](#) (String message, Throwable cause)

5.20.1 Constructor & Destructor Documentation

5.20.1.1 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperException.MWZooKeeperException (String message)`

5.20.1.2 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperException.MWZooKeeperException (String message, Throwable cause)`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperException.java`

5.21 eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation Enum Reference

Public Attributes

- [CREATE](#)

- [DELETE](#)
- [GET_DATA](#)
- [SET_DATA](#)
- [CLOSE_SESSION](#)

5.21.1 Member Data Documentation

5.21.1.1 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation.CLOSE_SESSION](#)

5.21.1.2 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation.CREATE](#)

5.21.1.3 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation.DELETE](#)

5.21.1.4 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation.GET_DATA](#)

5.21.1.5 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperOperation.SET_DATA](#)

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

- [cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperOperation.java](#)

5.22 eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest Class Reference

Public Member Functions

- `byte[] serialize ()` throws `IOException`
- `MWZooKeeperRequest (MWZooKeeperOperation operation, String path)`
- `MWZooKeeperRequest (MWZooKeeperOperation operation, String path, int version)`
- `MWZooKeeperRequest (MWZooKeeperOperation operation, String path, int version, Serializable payload)`
- `MWZooKeeperOperation getOperation ()`
- `void setPath (String path)`
- `String getPath ()`
- `int getVersion ()`
- `void setPayload (Serializable payload)`
- `Serializable getPayload ()`
- `long getSessionID ()`
- `void setSessionID (long sessionID)`
- `long getTime ()`
- `void setTime (long time)`
- `void setNodeIndex (int nodeIndex)`
- `int getNodeIndex ()`
- `String toString ()`

Static Public Member Functions

- `static MWZooKeeperRequest deserialize (byte[] data)` throws `IOException`, `ClassNotFoundException`

5.22.1 Constructor & Destructor Documentation

- 5.22.1.1 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.MWZooKeeperRequest (MWZooKeeperOperation operation, String path)`
- 5.22.1.2 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.MWZooKeeperRequest (MWZooKeeperOperation operation, String path, int version)`
- 5.22.1.3 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.MWZooKeeperRequest (MWZooKeeperOperation operation, String path, int version, Serializable payload)`

5.22.2 Member Function Documentation

- 5.22.2.1 `static MWZooKeeperRequest eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.deserialize (byte[] data) throws IOException, ClassNotFoundException [static]`
- 5.22.2.2 `int eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getNodeIndex ()`
- 5.22.2.3 `MWZooKeeperOperation eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getOperation ()`
- 5.22.2.4 `String eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getPath ()`
- 5.22.2.5 `Serializable eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getPayload ()`
- 5.22.2.6 `long eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getSessionID ()`
- 5.22.2.7 `long eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getTime ()`
- 5.22.2.8 `int eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.getVersion ()`
- 5.22.2.9 `byte [] eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.serialize () throws IOException`
- 5.22.2.10 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.setNodeIndex (int nodeIndex)`
- 5.22.2.11 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.setPath (String path)`
- 5.22.2.12 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.setPayload (Serializable payload)`
- 5.22.2.13 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.setSessionID (long sessionID)`
- 5.22.2.14 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.setTime (long time)`
- 5.22.2.15 `String eu.tclouds.cheapbft.demo.zk.MWZooKeeperRequest.toString ()`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperRequest.java`

5.23 eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse Class Reference

Public Member Functions

- [MWZooKeeperResponse](#) ()
- [MWZooKeeperResponse](#) (Serializable payload)
- `byte[] serialize ()` throws `IOException`

- void [setPayload](#) (Serializable payload)
- Serializable [getPayload](#) () throws MWZooKeeperException

Static Public Member Functions

- static [MWZooKeeperResponse deserialize](#) (byte[] data) throws IOException, ClassNotFoundException

5.23.1 Constructor & Destructor Documentation

5.23.1.1 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.MWZooKeeperResponse ()`

5.23.1.2 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.MWZooKeeperResponse (Serializable payload)`

5.23.2 Member Function Documentation

5.23.2.1 `static MWZooKeeperResponse eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.deserialize (byte[] data)`
throws IOException, ClassNotFoundException [static]

5.23.2.2 `Serializable eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.getPayload ()` throws
MWZooKeeperException

5.23.2.3 `byte [] eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.serialize ()` throws IOException

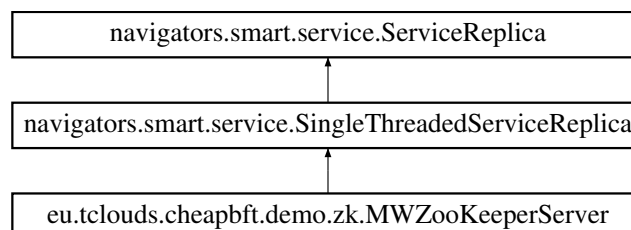
5.23.2.4 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperResponse.setPayload (Serializable payload)`

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

- cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperResponse.java

5.24 eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer Class Reference

Inheritance diagram for eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer:



Classes

- class [Snapper](#)

Public Member Functions

- [MWZooKeeperServer](#) (int id) throws ConfigurationException

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceResult executeCommand](#) (int clientid, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)
- synchronized [ServiceCheckpoint createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)
- [SimpleServiceStateUpdate logRequest](#) ([SimpleServiceStateUpdate](#) upd, boolean isupdate) throws IOException
- [MWZooKeeperResponse processRequest](#) ([MWZooKeeperRequest](#) request)

Additional Inherited Members

5.24.1 Constructor & Destructor Documentation

5.24.1.1 [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.MWZooKeeperServer](#) (int *id*) throws [ConfigurationException](#)

5.24.2 Member Function Documentation

5.24.2.1 void [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.applyUpdate](#) ([ServiceStateUpdate](#) *update*)
[protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.24.2.2 synchronized [ServiceCheckpoint](#) [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.createCheckpoint](#) ()
[protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.24.2.3 [ServiceResult](#) [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.executeCommand](#) (int *clientId*, long *timestamp*, byte[] *nonces*, byte[] *command*, [DebugInfo](#) *info*) [protected], [virtual]

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.24.2.4 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.loadCheckpoint (ServiceCheckpoint cp)`
`[protected], [virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.24.2.5 `SimpleServiceStateUpdate eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.logRequest (SimpleServiceStateUpdate upd, boolean isupdate) throws IOException` `[protected]`

5.24.2.6 `static void eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.main (String[] args) throws Exception` `[static]`

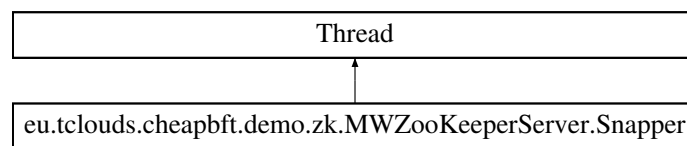
5.24.2.7 `MWZooKeeperResponse eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.processRequest (MWZooKeeperRequest request)` `[protected]`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperServer.java`

5.25 eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.Snapper Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.Snapper`:



Public Member Functions

- `void run ()`

5.25.1 Member Function Documentation

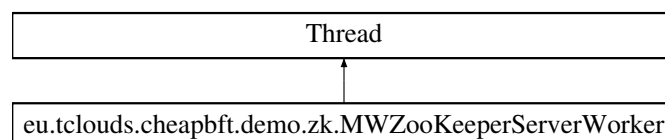
5.25.1.1 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer.Snapper.run ()`

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

- `cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperServer.java`

5.26 eu.tclouds.cheapbft.demo.zk.MWZooKeeperServerWorker Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.demo.zk.MWZooKeeperServerWorker`:



Public Member Functions

- [MWZooKeeperServerWorker](#) ([MWZooKeeperServer](#) zooKeeper, long sessionID, Socket socket) throws IOException
- void [addResponse](#) ([MWZooKeeperResponse](#) response)
- void [run](#) ()

5.26.1 Constructor & Destructor Documentation

- 5.26.1.1 `eu.tclouds.cheapbft.demo.zk.MWZooKeeperServerWorker.MWZooKeeperServerWorker (MWZooKeeperServer zooKeeper, long sessionID, Socket socket)` throws IOException

5.26.2 Member Function Documentation

- 5.26.2.1 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperServerWorker.addResponse (MWZooKeeperResponse response)`

- 5.26.2.2 `void eu.tclouds.cheapbft.demo.zk.MWZooKeeperServerWorker.run ()`

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

- cheap/src/eu/tclouds/cheapbft/demo/zk/MWZooKeeperServerWorker.java

5.27 eu.tclouds.cheapbft.demo.zk.Serializer Class Reference

Static Public Member Functions

- static Object [deserialize](#) (byte[] data) throws IOException, ClassNotFoundException
- static byte[] [serialize](#) (Serializable obj) throws IOException

5.27.1 Member Function Documentation

- 5.27.1.1 `static Object eu.tclouds.cheapbft.demo.zk.Serializer.deserialize (byte[] data)` throws IOException, ClassNotFoundException [static]

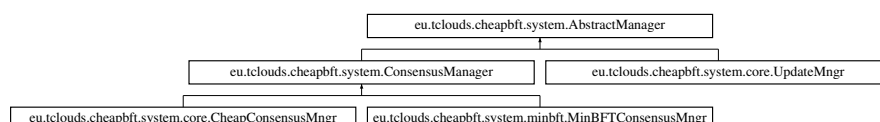
- 5.27.1.2 `static byte [] eu.tclouds.cheapbft.demo.zk.Serializer.serialize (Serializable obj)` throws IOException [static]

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

- cheap/src/eu/tclouds/cheapbft/demo/zk/Serializer.java

5.28 eu.tclouds.cheapbft.system.AbstractManager Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.AbstractManager:



Public Member Functions

- int [getProcessId](#) ()
- abstract boolean [isLeader](#) ()

Protected Member Functions

- [AbstractManager](#) ([CommunicationLayerImpl com](#), int [processID](#), [ReplicaRole role](#), byte [protocolID](#))

Protected Attributes

- [CommunicationLayerImpl com](#)
- int [processID](#)
- [ReplicaRole role](#)
- byte [protocolID](#)

5.28.1 Constructor & Destructor Documentation

5.28.1.1 [eu.tclouds.cheapbft.system.AbstractManager.AbstractManager](#) ([CommunicationLayerImpl com](#), int *processID*, [ReplicaRole role](#), byte *protocolID*) [protected]

5.28.2 Member Function Documentation

5.28.2.1 int [eu.tclouds.cheapbft.system.AbstractManager.getProcessId](#) ()

5.28.2.2 abstract boolean [eu.tclouds.cheapbft.system.AbstractManager.isLeader](#) () [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMgr](#), [eu.tclouds.cheapbft.system.core.UpdateMgr](#), and [eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMgr](#).

5.28.3 Member Data Documentation

5.28.3.1 [CommunicationLayerImpl eu.tclouds.cheapbft.system.AbstractManager.com](#) [protected]

5.28.3.2 int [eu.tclouds.cheapbft.system.AbstractManager.processID](#) [protected]

5.28.3.3 byte [eu.tclouds.cheapbft.system.AbstractManager.protocolID](#) [protected]

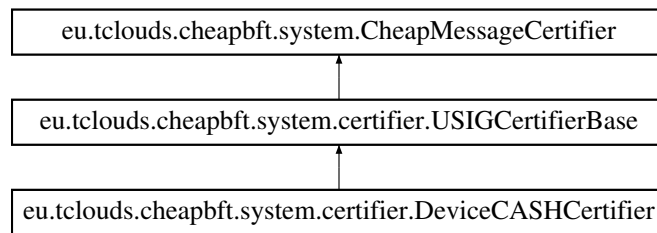
5.28.3.4 [ReplicaRole eu.tclouds.cheapbft.system.AbstractManager.role](#) [protected]

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

- [cheap/src/eu/tclouds/cheapbft/system/AbstractManager.java](#)

5.29 eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier Class Reference

Inheritance diagram for [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier](#):



Public Member Functions

- [DeviceCASHCertifier](#) (int procid) throws ConfigurationException
- synchronized void [setDisplayDigitShift](#) (int shift) throws IOException
- void [close](#) () throws IOException

Protected Member Functions

- synchronized [MessageCertificate](#) [createCertificate](#) (byte[] msghash, [CounterMode](#) cm)
- synchronized boolean [verifyCertificate](#) (byte[] msghash, [MessageCertificate](#) cert)

5.29.1 Constructor & Destructor Documentation

5.29.1.1 [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier.DeviceCASHCertifier](#) (int *procid*) throws ConfigurationException

5.29.2 Member Function Documentation

5.29.2.1 void [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier.close](#) () throws IOException

5.29.2.2 synchronized [MessageCertificate](#) [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier.createCertificate](#) (byte[] *msghash*, [CounterMode](#) *cm*) [protected], [virtual]

Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

5.29.2.3 synchronized void [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier.setDisplayDigitShift](#) (int *shift*) throws IOException

5.29.2.4 synchronized boolean [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier.verifyCertificate](#) (byte[] *msghash*, [MessageCertificate](#) *cert*) [protected], [virtual]

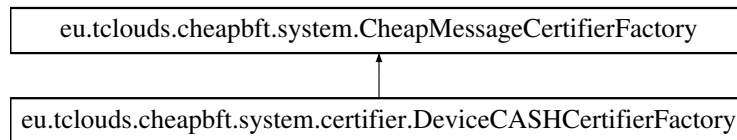
Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

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

- cheap/src/eu/tclouds/cheapbft/system/certifier/DeviceCASHCertifier.java

5.30 eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifierFactory Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifierFactory:



Public Member Functions

- [DeviceCASHCertifier createMessageCertifier](#) (int procid) throws ConfigurationException

5.30.1 Member Function Documentation

5.30.1.1 **DeviceCASHCertifier** `eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifierFactory.createMessageCertifier (int procid)` throws ConfigurationException

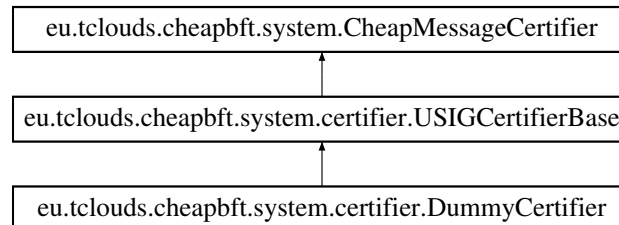
Implements [eu.tclouds.cheapbft.system.CheapMessageCertifierFactory](#).

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

- `cheap/src/eu/tclouds/cheapbft/system/certifier/DeviceCASHCertifierFactory.java`

5.31 eu.tclouds.cheapbft.system.certifier.DummyCertifier Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.certifier.DummyCertifier`:



Public Member Functions

- [DummyCertifier](#) (int procid)
- synchronized [MessageCertificate createCertificate](#) ([CheapMessage](#) msg)
- synchronized boolean [verifyCertificate](#) ([CheapMessage](#) msg, [MessageCertificate](#) cert)

Protected Member Functions

- [MessageCertificate createCertificate](#) (byte[] msghash, [CounterMode](#) cm)
- boolean [verifyCertificate](#) (byte[] msghash, [MessageCertificate](#) cert)

5.31.1 Constructor & Destructor Documentation

5.31.1.1 `eu.tclouds.cheapbft.system.certifier.DummyCertifier.DummyCertifier (int procid)`

5.31.2 Member Function Documentation

5.31.2.1 **synchronized MessageCertificate** eu.tclouds.cheapbft.system.certifier.DummyCertifier.createCertificate (**CheapMessage msg**)

Implements [eu.tclouds.cheapbft.system.CheapMessageCertifier](#).

5.31.2.2 **MessageCertificate** eu.tclouds.cheapbft.system.certifier.DummyCertifier.createCertificate (**byte[] msghash**, **CounterMode cm**) [protected], [virtual]

Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

5.31.2.3 **synchronized boolean** eu.tclouds.cheapbft.system.certifier.DummyCertifier.verifyCertificate (**CheapMessage msg**, **MessageCertificate cert**)

Verify whether the certificate is valid for the given message. This also includes a check whether the right counter was used for the type of the message.

Parameters

<i>msg</i>	
<i>cert</i>	

Returns

true if the certificate is valid for the given message

Implements [eu.tclouds.cheapbft.system.CheapMessageCertifier](#).

5.31.2.4 **boolean** eu.tclouds.cheapbft.system.certifier.DummyCertifier.verifyCertificate (**byte[] msghash**, **MessageCertificate cert**) [protected], [virtual]

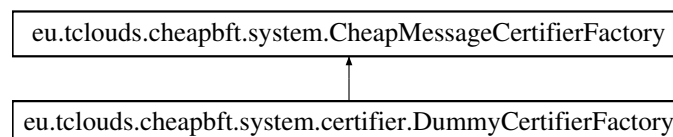
Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

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

- cheap/src/eu/tclouds/cheapbft/system/certifier/DummyCertifier.java

5.32 eu.tclouds.cheapbft.system.certifier.DummyCertifierFactory Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.certifier.DummyCertifierFactory:



Public Member Functions

- [DummyCertifier createMessageCertifier](#) (int procid)

5.32.1 Member Function Documentation

5.32.1.1 DummyCertifier eu.tclouds.cheapbft.system.certifier.DummyCertifierFactory.createMessageCertifier (int *procid*)

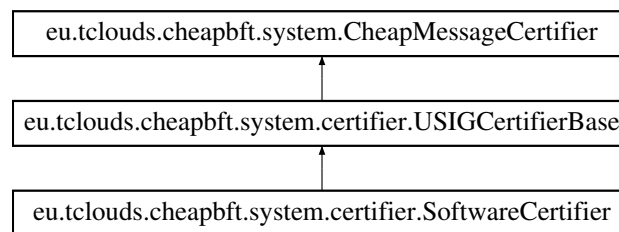
Implements [eu.tclouds.cheapbft.system.CheapMessageCertifierFactory](#).

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

- `cheap/src/eu/tclouds/cheapbft/system/certifier/DummyCertifierFactory.java`

5.33 eu.tclouds.cheapbft.system.certifier.SoftwareCertifier Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.certifier.SoftwareCertifier:



Public Member Functions

- [SoftwareCertifier](#) (int *procid*) throws `ConfigurationException`

Protected Member Functions

- synchronized [MessageCertificate](#) [createCertificate](#) (byte[] *msghash*, [CounterMode](#) *cm*)
- synchronized boolean [verifyCertificate](#) (byte[] *msghash*, [MessageCertificate](#) *cert*)

5.33.1 Constructor & Destructor Documentation

5.33.1.1 eu.tclouds.cheapbft.system.certifier.SoftwareCertifier.SoftwareCertifier (int *procid*) throws `ConfigurationException`

5.33.2 Member Function Documentation

5.33.2.1 synchronized `MessageCertificate` eu.tclouds.cheapbft.system.certifier.SoftwareCertifier.createCertificate (byte[] *msghash*, `CounterMode` *cm*) [protected], [virtual]

Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

5.33.2.2 synchronized boolean eu.tclouds.cheapbft.system.certifier.SoftwareCertifier.verifyCertificate (byte[] *msghash*, `MessageCertificate` *cert*) [protected], [virtual]

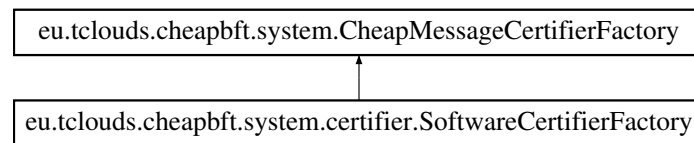
Implements [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

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

- `cheap/src/eu/tclouds/cheapbft/system/certifier/SoftwareCertifier.java`

5.34 eu.tclouds.cheapbft.system.certifier.SoftwareCertifierFactory Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.certifier.SoftwareCertifierFactory:



Public Member Functions

- [SoftwareCertifier createMessageCertifier](#) (int procid) throws ConfigurationException

5.34.1 Member Function Documentation

5.34.1.1 **SoftwareCertifier** eu.tclouds.cheapbft.system.certifier.SoftwareCertifierFactory.createMessageCertifier (int procid) throws ConfigurationException

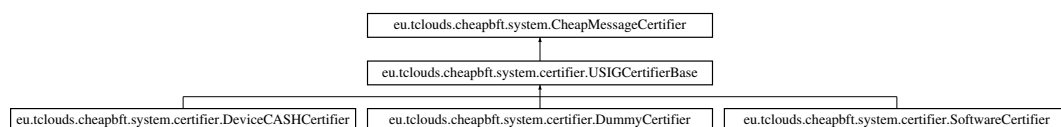
Implements [eu.tclouds.cheapbft.system.CheapMessageCertifierFactory](#).

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

- cheap/src/eu/tclouds/cheapbft/system/certifier/SoftwareCertifierFactory.java

5.35 eu.tclouds.cheapbft.system.certifier.USIGCertifierBase Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.certifier.USIGCertifierBase:



Public Member Functions

- [USIGCertifierBase](#) (int procid)
- [MessageCertificate createCertificate](#) ([CheapMessage](#) msg)
- boolean [verifyCertificate](#) ([CheapMessage](#) msg, [MessageCertificate](#) cert)
- int [getProcessID](#) ()
- long [readoutPerformanceCounters](#) ([MeasurementResult](#) pccertify, [MeasurementResult](#) pcverify)

Protected Member Functions

- abstract [MessageCertificate createCertificate](#) (byte[] msghash, [CounterMode](#) cm)
- abstract boolean [verifyCertificate](#) (byte[] msghash, [MessageCertificate](#) cert)
- void [startedCertifying](#) ()
- void [finishedCertifying](#) ()
- void [startedVerifying](#) ()
- void [finishedVerifying](#) ()

5.35.1 Constructor & Destructor Documentation

5.35.1.1 `eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.USIGCertifierBase (int procid)`

5.35.2 Member Function Documentation

5.35.2.1 **MessageCertificate** `eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.createCertificate (CheapMessage msg)`

Implements [eu.tclouds.cheapbft.system.CheapMessageCertifier](#).

5.35.2.2 **abstract MessageCertificate** `eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.createCertificate (byte[] msghash, CounterMode cm)` [protected],[pure virtual]

Implemented in [eu.tclouds.cheapbft.system.certifier.DummyCertifier](#), [eu.tclouds.cheapbft.system.certifier.SoftwareCertifier](#), and [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier](#).

5.35.2.3 `void eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.finishedCertifying ()` [protected]

5.35.2.4 `void eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.finishedVerifying ()` [protected]

5.35.2.5 `int eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.getProcessID ()`

5.35.2.6 `long eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.readoutPerformanceCounters (MeasurementResult pccertify, MeasurementResult pcverify)`

Implements [eu.tclouds.cheapbft.system.CheapMessageCertifier](#).

5.35.2.7 `void eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.startedCertifying ()` [protected]

5.35.2.8 `void eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.startedVerifying ()` [protected]

5.35.2.9 **boolean** `eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.verifyCertificate (CheapMessage msg, MessageCertificate cert)`

Verify whether the certificate is valid for the given message. This also includes a check whether the right counter was used for the type of the message.

Parameters

<i>msg</i>	
<i>cert</i>	

Returns

true if the certificate is valid for the given message

Implements [eu.tclouds.cheapbft.system.CheapMessageCertifier](#).

5.35.2.10 **abstract boolean** `eu.tclouds.cheapbft.system.certifier.USIGCertifierBase.verifyCertificate (byte[] msghash, MessageCertificate cert)` [protected],[pure virtual]

Implemented in [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifier](#), [eu.tclouds.cheapbft.system.certifier.SoftwareCertifier](#), and [eu.tclouds.cheapbft.system.certifier.DummyCertifier](#).

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

- cheap/src/eu/tclouds/cheapbft/system/certifier/USIGCertifierBase.java

5.36 eu.tclouds.cheapbft.system.CheapConsensus Class Reference

Public Member Functions

- [CheapConsensus](#) (long id)
- void [receivedPrepare](#) ([PrepareMessage](#) prepare, [TOMMessage](#)[] proposal) throws IOException
- void [receivedCommit](#) ([CommitMessage](#) commit) throws IOException
- boolean [isDecidable](#) (int f)
- long [getID](#) ()
- [PrepareMessage](#) [getPrepare](#) ()
- [TOMMessage](#)[] [getProposal](#) ()
- Collection< [CommitMessage](#) > [getCommits](#) ()

5.36.1 Constructor & Destructor Documentation

5.36.1.1 eu.tclouds.cheapbft.system.CheapConsensus.CheapConsensus (long id)

5.36.2 Member Function Documentation

5.36.2.1 Collection<[CommitMessage](#)> eu.tclouds.cheapbft.system.CheapConsensus.getCommits ()

5.36.2.2 long eu.tclouds.cheapbft.system.CheapConsensus.getID ()

5.36.2.3 [PrepareMessage](#) eu.tclouds.cheapbft.system.CheapConsensus.getPrepare ()

5.36.2.4 [TOMMessage](#) [] eu.tclouds.cheapbft.system.CheapConsensus.getProposal ()

5.36.2.5 boolean eu.tclouds.cheapbft.system.CheapConsensus.isDecidable (int f)

5.36.2.6 void eu.tclouds.cheapbft.system.CheapConsensus.receivedCommit ([CommitMessage](#) commit) throws IOException

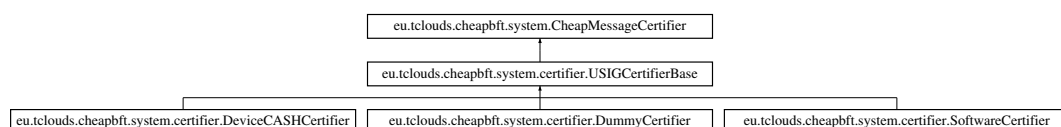
5.36.2.7 void eu.tclouds.cheapbft.system.CheapConsensus.receivedPrepare ([PrepareMessage](#) prepare, [TOMMessage](#)[] proposal) throws IOException

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

- cheap/src/eu/tclouds/cheapbft/system/CheapConsensus.java

5.37 eu.tclouds.cheapbft.system.CheapMessageCertifier Interface Reference

Inheritance diagram for eu.tclouds.cheapbft.system.CheapMessageCertifier:



Public Member Functions

- [MessageCertificate](#) [createCertificate](#) ([CheapMessage](#) msg)
- boolean [verifyCertificate](#) ([CheapMessage](#) msg, [MessageCertificate](#) cert)
- long [readoutPerformanceCounters](#) ([MeasurementResult](#) pccertify, [MeasurementResult](#) pcverify)

5.37.1 Member Function Documentation

5.37.1.1 [MessageCertificate](#) [eu.tclouds.cheapbft.system.CheapMessageCertifier.createCertificate](#) ([CheapMessage](#) msg)

Implemented in [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#), and [eu.tclouds.cheapbft.system.certifier.DummyCertifier](#).

5.37.1.2 long [eu.tclouds.cheapbft.system.CheapMessageCertifier.readoutPerformanceCounters](#) ([MeasurementResult](#) pccertify, [MeasurementResult](#) pcverify)

Implemented in [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

5.37.1.3 boolean [eu.tclouds.cheapbft.system.CheapMessageCertifier.verifyCertificate](#) ([CheapMessage](#) msg, [MessageCertificate](#) cert)

Verify whether the certificate is valid for the given message. This also includes a check whether the right counter was used for the type of the message.

Parameters

<i>msg</i>	
<i>cert</i>	

Returns

true if the certificate is valid for the given message

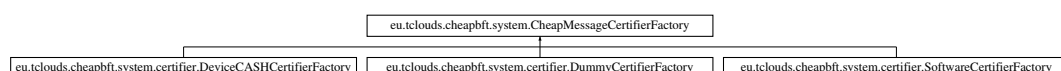
Implemented in [eu.tclouds.cheapbft.system.certifier.DummyCertifier](#), and [eu.tclouds.cheapbft.system.certifier.USIGCertifierBase](#).

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

- cheap/src/eu/tclouds/cheapbft/system/CheapMessageCertifier.java

5.38 [eu.tclouds.cheapbft.system.CheapMessageCertifierFactory](#) Interface Reference

Inheritance diagram for [eu.tclouds.cheapbft.system.CheapMessageCertifierFactory](#):



Public Member Functions

- [CheapMessageCertifier](#) [createMessageCertifier](#) (int procid) throws [ConfigurationException](#)

5.38.1 Member Function Documentation

5.38.1.1 CheapMessageCertifier eu.tclouds.cheapbft.system.CheapMessageCertifierFactory.createMessageCertifier (int *procid*) throws ConfigurationException

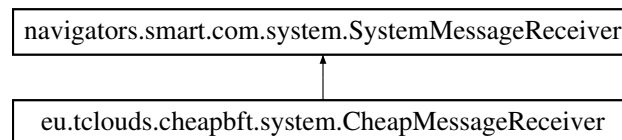
Implemented in [eu.tclouds.cheapbft.system.certifier.DeviceCASHCertifierFactory](#), [eu.tclouds.cheapbft.system.-certifier.DummyCertifierFactory](#), and [eu.tclouds.cheapbft.system.certifier.SoftwareCertifierFactory](#).

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

- `cheap/src/eu/tclouds/cheapbft/system/CheapMessageCertifierFactory.java`

5.39 eu.tclouds.cheapbft.system.CheapMessageReceiver Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.CheapMessageReceiver:



Public Member Functions

- [CheapMessageReceiver](#) ([CheapService](#) service, [CheapMessageCertifier](#) certifier)
- void [receivedSystemMessage](#) (byte typeid, int sender, ByteBuffer msgbuf)
- void [validateMessageSequence](#) ([ReplicaRole](#) role, [CheapMessage](#) msg) throws IOException
- void [validateProposalSequence](#) ([PrepareMessage](#) prepare) throws IOException

5.39.1 Constructor & Destructor Documentation

5.39.1.1 eu.tclouds.cheapbft.system.CheapMessageReceiver.CheapMessageReceiver (CheapService service, CheapMessageCertifier certifier)

5.39.2 Member Function Documentation

5.39.2.1 void eu.tclouds.cheapbft.system.CheapMessageReceiver.receivedSystemMessage (byte typeid, int sender, ByteBuffer msgbuf)

Implements [navigators.smart.com.system.SystemMessageReceiver](#).

5.39.2.2 void eu.tclouds.cheapbft.system.CheapMessageReceiver.validateMessageSequence (ReplicaRole role, CheapMessage msg) throws IOException

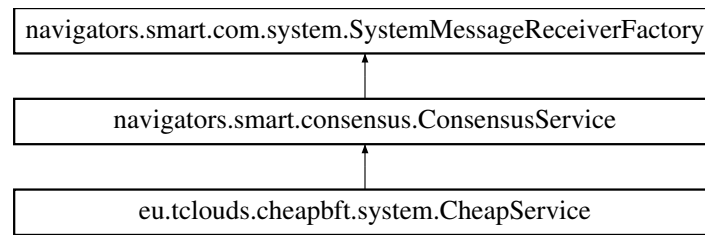
5.39.2.3 void eu.tclouds.cheapbft.system.CheapMessageReceiver.validateProposalSequence (PrepareMessage prepare) throws IOException

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

- `cheap/src/eu/tclouds/cheapbft/system/CheapMessageReceiver.java`

5.40 eu.tclouds.cheapbft.system.CheapService Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.CheapService:



Public Member Functions

- [CheapService](#) ([TOMLayer](#) tomlayer, [ConsensusManager](#) consMgr) throws [ConfigurationException](#)
- void [start](#) () throws [InterruptedException](#)
- [CheapMessageReceiver](#) [createServerMessageReceiver](#) (int remoteid)
- [CheapMessageReceiver](#) [getReceiver](#) (int remoteid)
- [CheapMessage](#) [readMessageFrom](#) (byte typeid, [ByteBuffer](#) in) throws [IOException](#)
- final int [getProcessID](#) ()
- int [getProposer](#) ([Consensus](#)<?> cons)
- boolean [isProposer](#) ()
- int [numberOfActiveReplicas](#) ()
- int [numberOfFullReplies](#) ()
- [CheapMessageCertifier](#) [getMessageCertifier](#) ()
- String [getProtocolName](#) ()
- [ReplicaRole](#) [getRole](#) ()
- boolean [isWithinMajority](#) ()
- void [proposeRequests](#) ()
- void [requestDecided](#) ([TOMMessage](#) msg)
- void [requestExecuted](#) ([ServiceResult](#) res)
- void [createCheckpoint](#) ([Consensus](#)<?> cons, [ServiceCheckpoint](#) scp)
- void [requestReplied](#) ([ServiceResult](#) res, [TOMMessage](#) reply, [MessageDigest](#) digest)
- void [consensusDelivered](#) ([Consensus](#)<?> cons)
- void [receivedCertifiedMessage](#) ([CheapMessage](#) msg)
- void [processPrepareMessage](#) ([PrepareMessage](#) prepmsg)
- void [processCommitMessage](#) ([CommitMessage](#) comsg)
- void [processUpdateMessage](#) ([UpdateMessage](#) updmsg)
- void [processCheckpointMessage](#) ([CheckpointMessage](#) cpmsg)
- void [processSwitchMessage](#) ([SwitchMessage](#) sw)
- void [processCheckpointRequestMessage](#) ([CheckpointRequestMessage](#) cpr)
- void [sendCheckpointRequest](#) ()
- void [sendMessage](#) ([Iterable](#)< [Integer](#) > targets, [CheapMessage](#) msg)
- void [processStateManagementMessage](#) ([SMMessage](#) msg)
- void [processForwardedMessage](#) ([ForwardedMessage](#) msg)
- void [processTimeoutMessage](#) ([RTMessage](#) msg)
- void [processRecoveryMessage](#) ([RequestRecoveryMessage](#) msg)
- void [startDeliverState](#) ()
- void [deliverState](#) ([TransferableState](#) state)
- byte[] [getState](#) ([Consensus](#)<?> cons)

Static Public Attributes

- static final byte [MSGTYPEID_PREPARE](#) = 50
- static final byte [MSGTYPEID_COMMIT](#) = 51
- static final byte [MSGTYPEID_UPDATE](#) = 52
- static final byte [MSGTYPEID_CHECKPOINT](#) = 53
- static final byte [MSGTYPEID_PANIC](#) = 54
- static final byte [MSGTYPEID_NEWPROTOCOL](#) = 55
- static final byte [MSGTYPEID_SWITCH](#) = 56
- static final byte [MSGTYPEID_CHECKPOINTREQUEST](#) = 57

Package Functions

- void [switchProtocol](#) ([ConsensusManager](#) newprot)

5.40.1 Constructor & Destructor Documentation

- 5.40.1.1 [eu.tclouds.cheapbft.system.CheapService.CheapService](#) ([TOMLayer](#) *tomlayer*, [ConsensusManager](#) *consMngr*)
throws [ConfigurationException](#)

5.40.2 Member Function Documentation

- 5.40.2.1 void [eu.tclouds.cheapbft.system.CheapService.consensusDelivered](#) ([Consensus](#)<?> *cons*)

Called when the TOMLayer finished the delivery of the request and notified the consensuslayer of all the batched requests that where decided with this consensus.

Parameters

<i>cons</i>	The finished consensus.
-------------	-------------------------

Implements [navigators.smart.consensus.ConsensusService](#).

- 5.40.2.2 void [eu.tclouds.cheapbft.system.CheapService.createCheckpoint](#) ([Consensus](#)<?> *cons*, [ServiceCheckpoint](#) *scp*)

Implements [navigators.smart.consensus.ConsensusService](#).

- 5.40.2.3 [CheapMessageReceiver](#) [eu.tclouds.cheapbft.system.CheapService.createServerMessageReceiver](#) (int *remoteid*)

Implements [navigators.smart.com.system.SystemMessageReceiverFactory](#).

- 5.40.2.4 void [eu.tclouds.cheapbft.system.CheapService.deliverState](#) ([TransferableState](#) *state*)

Notifies the service of a successful state transfer to indicate leaderchanges and so on. The decided requests need to be indicated seperately because the consensus doesn't know the internal structure of the batches and therefor cannot see which single requests where decided in the transferred state.

Parameters

<i>state</i>	
--------------	--

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.5 **CheapMessageCertifier** eu.tclouds.cheapbft.system.CheapService.getMessageCertifier ()

5.40.2.6 **final int** eu.tclouds.cheapbft.system.CheapService.getProcessID ()

Returns the id of this replicas consensus service

Returns

The consensus service id

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.7 **int** eu.tclouds.cheapbft.system.CheapService.getProposer (*Consensus<?> cons*)

Returns the id of the leader of the given round

Parameters

<i>cons</i>	The Consensus that we wish to get the Proposer for
-------------	--

Returns

The id of the leader for the given consensus

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.8 **String** eu.tclouds.cheapbft.system.CheapService.getProtocolName ()

5.40.2.9 **CheapMessageReceiver** eu.tclouds.cheapbft.system.CheapService.getReceiver (*int remoteid*)

5.40.2.10 **ReplicaRole** eu.tclouds.cheapbft.system.CheapService.getRole ()

5.40.2.11 **byte []** eu.tclouds.cheapbft.system.CheapService.getState (*Consensus<?> cons*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.12 **boolean** eu.tclouds.cheapbft.system.CheapService.isProposer ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.13 **boolean** eu.tclouds.cheapbft.system.CheapService.isWithinMajority ()

5.40.2.14 **int** eu.tclouds.cheapbft.system.CheapService.numberOfActiveReplicas ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.15 **int** eu.tclouds.cheapbft.system.CheapService.numberOfFullReplies ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.16 **void** eu.tclouds.cheapbft.system.CheapService.processCheckpointMessage (*CheckpointMessage cpmg*)

5.40.2.17 void eu.tclouds.cheapbft.system.CheapService.processCheckpointRequestMessage (CheckpointRequestMessage *cpr*)

5.40.2.18 void eu.tclouds.cheapbft.system.CheapService.processCommitMessage (CommitMessage *comsg*)

5.40.2.19 void eu.tclouds.cheapbft.system.CheapService.processForwardedMessage (ForwardedMessage *msg*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.20 void eu.tclouds.cheapbft.system.CheapService.processPrepareMessage (PrepareMessage *prepmg*)

5.40.2.21 void eu.tclouds.cheapbft.system.CheapService.processRecoveryMessage (RequestRecoveryMessage *msg*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.22 void eu.tclouds.cheapbft.system.CheapService.processStateManagementMessage (SMMessage *msg*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.23 void eu.tclouds.cheapbft.system.CheapService.processSwitchMessage (SwitchMessage *sw*)

5.40.2.24 void eu.tclouds.cheapbft.system.CheapService.processTimeoutMessage (RTMessage *msg*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.25 void eu.tclouds.cheapbft.system.CheapService.processUpdateMessage (UpdateMessage *updmsg*)

5.40.2.26 void eu.tclouds.cheapbft.system.CheapService.proposeRequests ()

Returns the number of the last successfully decided round

Returns

The roundnumber of the last descision Notifies the service of a new request to be decided. This is needed to detect malicious leaders that do not propose messages from some clients.

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.27 CheapMessage eu.tclouds.cheapbft.system.CheapService.readMessageFrom (byte *typeid*, ByteBuffer *in*) throws IOException

5.40.2.28 void eu.tclouds.cheapbft.system.CheapService.receivedCertifiedMessage (CheapMessage *msg*)

5.40.2.29 void eu.tclouds.cheapbft.system.CheapService.requestDecided (TOMMessage *msg*)

Notifies the service that the given request has been decided. This happens if we receive a state transfer

Parameters

<i>msg</i>	
------------	--

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.30 void eu.tclouds.cheapbft.system.CheapService.requestExecuted (*ServiceResult res*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.31 void eu.tclouds.cheapbft.system.CheapService.requestReplied (*ServiceResult res*, *TOMMessage reply*, *MessageDigest digest*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.32 void eu.tclouds.cheapbft.system.CheapService.sendCheckpointRequest ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.33 void eu.tclouds.cheapbft.system.CheapService.sendMessage (*Iterable< Integer > targets*, *CheapMessage msg*)

5.40.2.34 void eu.tclouds.cheapbft.system.CheapService.start () throws *InterruptedException*

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.35 void eu.tclouds.cheapbft.system.CheapService.startDeliverState ()

Indicates that the layer that uses the service starts to deliver a state

Implements [navigators.smart.consensus.ConsensusService](#).

5.40.2.36 void eu.tclouds.cheapbft.system.CheapService.switchProtocol (*ConsensusManager newprot*) [package]

5.40.3 Member Data Documentation

5.40.3.1 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_CHECKPOINT = 53 [static]

5.40.3.2 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_CHECKPOINTREQUEST = 57 [static]

5.40.3.3 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_COMMIT = 51 [static]

5.40.3.4 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_NEWPROTOCOL = 55 [static]

5.40.3.5 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_PANIC = 54 [static]

5.40.3.6 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_PREPARE = 50 [static]

5.40.3.7 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_SWITCH = 56 [static]

5.40.3.8 final byte eu.tclouds.cheapbft.system.CheapService.MSGTYPEID_UPDATE = 52 [static]

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

- cheap/src/eu/tclouds/cheapbft/system/CheapService.java

5.41 eu.tclouds.cheapbft.system.Checkpoint Class Reference

Public Member Functions

- [Checkpoint](#) (long *consid*, List< [CheapConsensus](#) > *cons*)
- void [receivedCheckpointMessage](#) ([CheckpointMessage](#) *cpmsg*)
- boolean [isStable](#) ()
- long [getConsensusID](#) ()
- List< [CheapConsensus](#) > [getConsensusInstances](#) ()

5.41.1 Constructor & Destructor Documentation

5.41.1.1 `eu.tclouds.cheapbft.system.Checkpoint.Checkpoint (long consid, List< CheapConsensus > cons)`

5.41.2 Member Function Documentation

5.41.2.1 `long eu.tclouds.cheapbft.system.Checkpoint.getConsensusID ()`

5.41.2.2 `List<CheapConsensus> eu.tclouds.cheapbft.system.Checkpoint.getConsensusInstances ()`

5.41.2.3 `boolean eu.tclouds.cheapbft.system.Checkpoint.isStable ()`

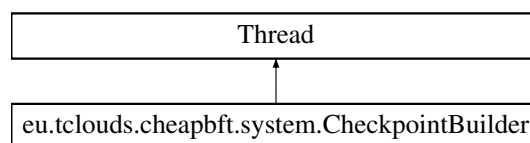
5.41.2.4 `void eu.tclouds.cheapbft.system.Checkpoint.receivedCheckpointMessage (CheckpointMessage cpmsg)`

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

- `cheap/src/eu/tclouds/cheapbft/system/Checkpoint.java`

5.42 eu.tclouds.cheapbft.system.CheckpointBuilder Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.CheckpointBuilder:



Public Member Functions

- [CheckpointBuilder](#) ([TOMConfiguration](#) *conf*, int *procid*, int *protepo*)
- void [start](#) ()
- void [add](#) ([ServiceResult](#) *res*)
- [CheckpointMessage](#) [finalizeCheckpoint](#) (int *consid*, byte[] *state*, byte[] *hash*)

Static Public Attributes

- static final boolean [USE_CHECKPOINT_BUILDER_THREAD](#) = true
- static final boolean [USE_INC_CHECKPOINTS](#) = false

5.42.1 Constructor & Destructor Documentation

5.42.1.1 `eu.tclouds.cheapbft.system.CheckpointBuilder.CheckpointBuilder (TOMConfiguration conf, int procid, int protePOCH)`

5.42.2 Member Function Documentation

5.42.2.1 `void eu.tclouds.cheapbft.system.CheckpointBuilder.add (ServiceResult res)`

5.42.2.2 `CheckpointMessage eu.tclouds.cheapbft.system.CheckpointBuilder.finalizeCheckpoint (int consid, byte[] state, byte[] hash)`

5.42.2.3 `void eu.tclouds.cheapbft.system.CheckpointBuilder.start ()`

5.42.3 Member Data Documentation

5.42.3.1 `final boolean eu.tclouds.cheapbft.system.CheckpointBuilder.USE_CHECKPOINT_BUILDER_THREAD = true`
[static]

5.42.3.2 `final boolean eu.tclouds.cheapbft.system.CheckpointBuilder.USE_INC_CHECKPOINTS = false` [static]

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

- `cheap/src/eu/tclouds/cheapbft/system/CheckpointBuilder.java`

5.43 eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate Class Reference

Public Member Functions

- [CheckpointCertificate](#) (List< [CheckpointMessage](#) > *checkpoints*)
- int [getMsgSize](#) ()
- long [getConsensusID](#) ()
- void [serialise](#) (ByteBuffer *out*)

Public Attributes

- final List< [CheckpointMessage](#) > *checkpoints*

5.43.1 Constructor & Destructor Documentation

5.43.1.1 `eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate.CheckpointCertificate (List< CheckpointMessage > checkpoints)`

5.43.2 Member Function Documentation

5.43.2.1 `long eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate.getConsensusID ()`

5.43.2.2 `int eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate.getMsgSize ()`

5.43.2.3 `void eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate.serialise (ByteBuffer out)`

5.43.3 Member Data Documentation

5.43.3.1 final List<CheckpointMessage> eu.tclouds.cheapbft.system.checkpointer.CheckpointCertificate.checkpoints

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

- cheap/src/eu/tclouds/cheapbft/system/checkpointer/CheckpointCertificate.java

5.44 eu.tclouds.cheapbft.system.checkpointer.CheckPointer Class Reference

Public Member Functions

- void [init](#) ([MessageBuilder](#) builder)
- synchronized void [register](#) ([ServiceResult](#) res)
- synchronized void [register](#) ([CheapMessage](#) msg)
- synchronized List< [CheapMessage](#) > [getMsgsSinceCP](#) ()
- final boolean [isCheckpointNeeded](#) (int seqId)
- void [doCheckpoint](#) (long consid, [ServiceCheckpoint](#) scp, Object sync)
- synchronized void [addToProposeHistory](#) ([PrepareMessage](#) prep)
- synchronized void [addToDeliveredConsensus](#) (Consensus< [TOMMessage](#)[]> cons)
- synchronized void [addToDeliveredConsensus](#) (long consid)
- synchronized boolean [receiveCPMsg](#) ([CheckpointMessage](#) cp)
- boolean [isWithinMajority](#) ()
- void [setComLayer](#) ([CommunicationLayer](#) com)
- synchronized [CheckpointCertificate](#) [getLastCPCert](#) ()
- synchronized List< [PrepareMessage](#) > [getPrepsSinceCP](#) ()
- synchronized List< [CheapMessage](#) > [getUpdateSinceCP](#) ()
- synchronized boolean [IsAlreadyDelivered](#) (long consid)

Static Public Member Functions

- static [CheckPointer](#) [getInstance](#) ([TOMLayer](#) tomlayer, Integer sId, int f, int chPeriod, byte protocolID)

Static Public Attributes

- static final boolean [USE_CHECKPOINT_BUILDER](#) = true
- static final boolean [USE_INC_CHECKPOINTS](#) = false

5.44.1 Detailed Description

This handles the checkpointing. This class is not Threadsafe!

5.44.2 Member Function Documentation

5.44.2.1 synchronized void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.addToDeliveredConsensus (Consensus< [TOMMessage](#)[]> cons)

5.44.2.2 synchronized void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.addToDeliveredConsensus (long consid)

5.44.2.3 synchronized void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.addToProposeHistory ([PrepareMessage](#) prep)

Adds an accepted propose or skip to the history. If the watermark of a checkpoint is reached one is created and broadcast.

Parameters

<i>prep</i>	The Prepare object to be added to the history
-------------	---

- 5.44.2.4 void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.doCheckpoint (long *consid*, ServiceCheckpoint *scp*, Object *sync*)
- 5.44.2.5 static CheckPointer eu.tclouds.cheapbft.system.checkpointer.CheckPointer.getInstance (TOMLayer *tomlayer*, Integer *sld*, int *f*, int *chPeriod*, byte *protocolID*) [static]
- 5.44.2.6 synchronized CheckpointCertificate eu.tclouds.cheapbft.system.checkpointer.CheckPointer.getLastCPCert ()
- 5.44.2.7 synchronized List<CheapMessage> eu.tclouds.cheapbft.system.checkpointer.CheckPointer.getMsgsSinceCP ()
- 5.44.2.8 synchronized List<PrepareMessage> eu.tclouds.cheapbft.system.checkpointer.CheckPointer.getPrepsSinceCP ()
- 5.44.2.9 synchronized List<CheapMessage> eu.tclouds.cheapbft.system.checkpointer.CheckPointer.getUpdateSinceCP ()
- 5.44.2.10 void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.init (MessageBuilder *builder*)
- 5.44.2.11 synchronized boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.isAlreadyDelivered (long *consid*)
- 5.44.2.12 final boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.isCheckpointNeeded (int *seqId*)
- 5.44.2.13 boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.isWithinMajority ()
- 5.44.2.14 synchronized boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.receiveCPMsg (CheckpointMessage *cp*)
- 5.44.2.15 synchronized void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.register (ServiceResult *res*)
- 5.44.2.16 synchronized void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.register (CheapMessage *msg*)
- 5.44.2.17 void eu.tclouds.cheapbft.system.checkpointer.CheckPointer.setComLayer (CommunicationLayer *com*)

5.44.3 Member Data Documentation

- 5.44.3.1 final boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.USE_CHECKPOINT_BUILDER = true [static]
- 5.44.3.2 final boolean eu.tclouds.cheapbft.system.checkpointer.CheckPointer.USE_INC_CHECKPOINTS = false [static]

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

- cheap/src/eu/tclouds/cheapbft/system/checkpointer/CheckPointer.java

5.45 eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint Class Reference

Public Attributes

- boolean [accepted](#)
- [CheckpointMessage](#) *cp*

- [CheckpointMessage](#) `cpmsg`
- final `LinkedList< CheapMessage > msghistory` = new `LinkedList<CheapMessage>()`
- final `LinkedList< PrepareMessage > reqhistory` = new `LinkedList<PrepareMessage>()`
- final `LinkedList< CheapMessage > sentUpdateHistory` = new `LinkedList<CheapMessage>()`
- final `List< ServiceResult > replies` = new `LinkedList<ServiceResult>()`
- final `List< CheckpointMessage > answers` = new `LinkedList<CheckpointMessage>()`
- final `List< CheckpointMessage > otheranswers` = new `LinkedList<CheckpointMessage>()`
- final `Map< Long, Consensus`
`< TOMMessage[] > > deliveredConsensus` = new `HashMap<Long, Consensus<TOMMessage[] >>()`
- final `Map< Integer, UpdateMessage > recievedUpdateHistory` = new `HashMap<Integer, Update-`
`Message>()`

5.45.1 Member Data Documentation

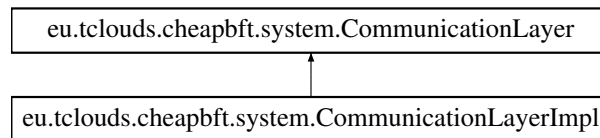
- 5.45.1.1 `boolean eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.accepted`
- 5.45.1.2 `final List< CheckpointMessage > eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.answers` = new `LinkedList<CheckpointMessage>()`
- 5.45.1.3 `CheckpointMessage eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.cp`
- 5.45.1.4 `CheckpointMessage eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.cpmsg`
- 5.45.1.5 `final Map<Long, Consensus<TOMMessage[] > > eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.-`
`deliveredConsensus` = new `HashMap<Long, Consensus<TOMMessage[] >>()`
- 5.45.1.6 `final LinkedList< CheapMessage > eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.msghistory` = new `LinkedList<CheapMessage>()`
- 5.45.1.7 `final List< CheckpointMessage > eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.otheranswers` = new `LinkedList<CheckpointMessage>()`
- 5.45.1.8 `final Map<Integer, UpdateMessage > eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.recievedUpdate-`
`History` = new `HashMap<Integer, UpdateMessage>()`
- 5.45.1.9 `final List<ServiceResult> eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.replies` = new `LinkedList<ServiceResult>()`
- 5.45.1.10 `final LinkedList<PrepareMessage> eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.reqhistory` = new `LinkedList<PrepareMessage>()`
- 5.45.1.11 `final LinkedList<CheapMessage> eu.tclouds.cheapbft.system.checkpointer.LocalCheckpoint.sentUpdateHistory`
`= new LinkedList<CheapMessage>()`

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

- `cheap/src/eu/tclouds/cheapbft/system/checkpointer/LocalCheckpoint.java`

5.46 eu.tclouds.cheapbft.system.CommunicationLayer Interface Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.CommunicationLayer`:



Public Member Functions

- void [broadcast](#) ([CheapMessage](#) msg)
- void [broadcast](#) ([CheapMessage](#) msg, boolean sendToitself)
- void [broadcastToActives](#) ([CheapMessage](#) msg)
- void [broadcastToPassives](#) ([CheapMessage](#) msg)
- void [setCurrentProtocolID](#) (byte protocolID)

5.46.1 Member Function Documentation

5.46.1.1 void eu.tclouds.cheapbft.system.CommunicationLayer.broadcast (CheapMessage msg)

Broadcasts a CheapMessage to the others and the replica itself

Implemented in [eu.tclouds.cheapbft.system.CommunicationLayerImpl](#).

5.46.1.2 void eu.tclouds.cheapbft.system.CommunicationLayer.broadcast (CheapMessage msg, boolean sendToitself)

Implemented in [eu.tclouds.cheapbft.system.CommunicationLayerImpl](#).

5.46.1.3 void eu.tclouds.cheapbft.system.CommunicationLayer.broadcastToActives (CheapMessage msg)

Implemented in [eu.tclouds.cheapbft.system.CommunicationLayerImpl](#).

5.46.1.4 void eu.tclouds.cheapbft.system.CommunicationLayer.broadcastToPassives (CheapMessage msg)

Implemented in [eu.tclouds.cheapbft.system.CommunicationLayerImpl](#).

5.46.1.5 void eu.tclouds.cheapbft.system.CommunicationLayer.setCurrentProtocolID (byte protocolID)

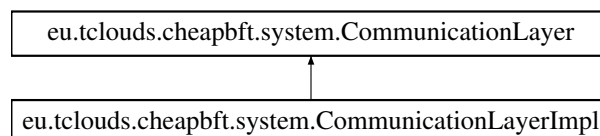
Implemented in [eu.tclouds.cheapbft.system.CommunicationLayerImpl](#).

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

- [cheap/src/eu/tclouds/cheapbft/system/CommunicationLayer.java](#)

5.47 eu.tclouds.cheapbft.system.CommunicationLayerImpl Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.CommunicationLayerImpl:



Public Member Functions

- void **init** ([CheapMessageCertifier](#) verifier, [ComMessageHub](#)< [CheapService](#) > sysmsgshub)
- [CommunicationLayerImpl](#) ([SystemCommunication](#) cs, [List](#)< [Integer](#) > receivers, int f, [CheckPointer](#) cp)
- [CommunicationLayerImpl](#) ([SystemCommunication](#) cs, [List](#)< [Integer](#) > allAcceptors, [List](#)< [Integer](#) > otherAcceptors, int f, [CheckPointer](#) cp)
- [SystemCommunication](#) **getSystemCom** ()
- void **send** ([Iterable](#)< [Integer](#) > targets, [CheapMessage](#) msg)
- void **broadcast** ([CheapMessage](#) msg)
- void **broadcast** ([CheapMessage](#) msg, boolean sentToItself)
- void **broadcastToActives** ([CheapMessage](#) msg)
- void **broadcastToPassives** ([CheapMessage](#) msg)
- void **setCurrentProtocolID** (byte protocolID)

Package Attributes

- [List](#)< [CheapMessage](#) > **m_lastmsgs** = new [LinkedList](#)<[CheapMessage](#)>()

5.47.1 Constructor & Destructor Documentation

5.47.1.1 [eu.tclouds.cheapbft.system.CommunicationLayerImpl.CommunicationLayerImpl](#) ([SystemCommunication](#) cs, [List](#)< [Integer](#) > receivers, int f, [CheckPointer](#) cp)

5.47.1.2 [eu.tclouds.cheapbft.system.CommunicationLayerImpl.CommunicationLayerImpl](#) ([SystemCommunication](#) cs, [List](#)< [Integer](#) > allAcceptors, [List](#)< [Integer](#) > otherAcceptors, int f, [CheckPointer](#) cp)

5.47.2 Member Function Documentation

5.47.2.1 void [eu.tclouds.cheapbft.system.CommunicationLayerImpl.broadcast](#) ([CheapMessage](#) msg)

Broadcasts a CheapMessage to the others and the replica itself

Implements [eu.tclouds.cheapbft.system.CommunicationLayer](#).

5.47.2.2 void [eu.tclouds.cheapbft.system.CommunicationLayerImpl.broadcast](#) ([CheapMessage](#) msg, boolean sentToItself)

Implements [eu.tclouds.cheapbft.system.CommunicationLayer](#).

5.47.2.3 void [eu.tclouds.cheapbft.system.CommunicationLayerImpl.broadcastToActives](#) ([CheapMessage](#) msg)

Implements [eu.tclouds.cheapbft.system.CommunicationLayer](#).

5.47.2.4 void [eu.tclouds.cheapbft.system.CommunicationLayerImpl.broadcastToPassives](#) ([CheapMessage](#) msg)

Implements [eu.tclouds.cheapbft.system.CommunicationLayer](#).

5.47.2.5 [SystemCommunication](#) [eu.tclouds.cheapbft.system.CommunicationLayerImpl.getSystemCom](#) ()

5.47.2.6 void [eu.tclouds.cheapbft.system.CommunicationLayerImpl.init](#) ([CheapMessageCertifier](#) verifier, [ComMessageHub](#)< [CheapService](#) > sysmsgshub)

5.47.2.7 void eu.tclouds.cheapbft.system.CommunicationLayerImpl.send (Iterable< Integer > *targets*, CheapMessage *msg*)

5.47.2.8 void eu.tclouds.cheapbft.system.CommunicationLayerImpl.setCurrentProtocolID (byte *protocolID*)

Implements [eu.tclouds.cheapbft.system.CommunicationLayer](#).

5.47.3 Member Data Documentation

5.47.3.1 List<CheapMessage> eu.tclouds.cheapbft.system.CommunicationLayerImpl.m_lastmsgs = new LinkedList<CheapMessage>() [package]

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

- cheap/src/eu/tclouds/cheapbft/system/CommunicationLayerImpl.java

5.48 eu.tclouds.cheapbft.system.ConsensusAlgorithms Enum Reference

Public Member Functions

- [ConsensusAlgorithms](#) (Byte *id*)

Public Attributes

- [CheapBFT](#) =(Byte.valueOf((byte)0))
- [MinBFT](#) =(Byte.valueOf((byte)1))
- Byte *id*

5.48.1 Constructor & Destructor Documentation

5.48.1.1 eu.tclouds.cheapbft.system.ConsensusAlgorithms.ConsensusAlgorithms (Byte *id*)

5.48.2 Member Data Documentation

5.48.2.1 eu.tclouds.cheapbft.system.ConsensusAlgorithms.CheapBFT =(Byte.valueOf((byte)0))

5.48.2.2 Byte eu.tclouds.cheapbft.system.ConsensusAlgorithms.id

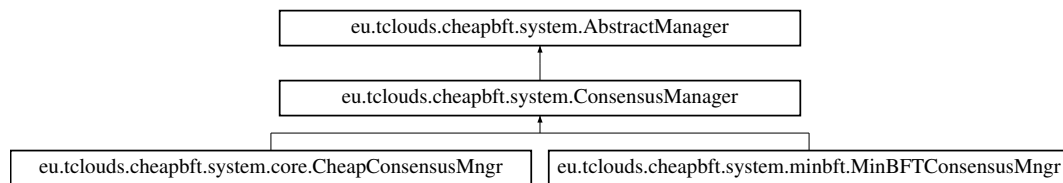
5.48.2.3 eu.tclouds.cheapbft.system.ConsensusAlgorithms.MinBFT =(Byte.valueOf((byte)1))

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

- cheap/src/eu/tclouds/cheapbft/system/ConsensusAlgorithms.java

5.49 eu.tclouds.cheapbft.system.ConsensusManager Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.ConsensusManager:



Public Member Functions

- void `init` (`MessageBuilder` builder)
- `MessageBuilder` `getMsgBuilder` ()
- long `getNextPropID` ()
- abstract int `numberOfActiveReplicas` ()
- abstract void `receivePrepare` (`PrepareMessage` prep)
- abstract void `receiveCommit` (`CommitMessage` commit)
- abstract void `receiveRequest` (`TOMMessage` req)
- void `receiveCheckpoint` (`CheckpointMessage` chkPoint)
- void `receiveUpdate` (`UpdateMessage` upd)
- void `notifyRequestExecuted` (`ServiceResult` res)
- void `createCheckpoint` (`Consensus`<?> cons, `ServiceCheckpoint` scp)
- void `notifyReplySent` (`ServiceResult` res, `TOMMessage` reply, `MessageDigest` digest)
- void `consensusDelivered` (`Consensus`<?> cons)
- void `forceCheckpoint` ()
- void `requestDecided` (`TOMMessage` msg)
- void `receiveSwitch` (`SwitchMessage` sw)
- void `switchFinished` ()
- abstract String `getName` ()

Protected Member Functions

- `ConsensusManager` (int `processID`, `CommunicationLayerImpl` com, `TOMLayer` tomlayer, int f, `ReplicaRole` role, `CheckPointer` cp, byte `protocolID`, long `nextpropid`)
- void `beforeCheckpoint` ()
- void `sendPrepare` (byte[] reqs)
- abstract void `send` (`PrepareMessage` msg)
- `Consensus`< `TOMMessage`[]> `createConsensus` (`PrepareMessage` prep) throws `IOException`

Protected Attributes

- `TOMLayer` tomlayer
- final Map< Long, `Consensus` < `TOMMessage`[]> > `startedConsensus` = new `HashMap`<Long, `Consensus`<`TOMMessage`[]>>()
- final Map< `MessageCertificate`, `PrepareMessage` > `processing`
- int f
- final `CheckPointer` checkPointer
- boolean `stopConsensus` = false

5.49.1 Constructor & Destructor Documentation

5.49.1.1 `eu.tclouds.cheapbft.system.ConsensusManager.ConsensusManager (int processID, CommunicationLayerImpl com, TOMLayer tomlayer, int f, ReplicaRole role, CheckPointer cp, byte protocolID, long nextpropid)` [protected]

5.49.2 Member Function Documentation

5.49.2.1 `void eu.tclouds.cheapbft.system.ConsensusManager.beforeCheckpoint ()` [protected]

5.49.2.2 `void eu.tclouds.cheapbft.system.ConsensusManager.consensusDelivered (Consensus<?> cons)`

5.49.2.3 `void eu.tclouds.cheapbft.system.ConsensusManager.createCheckpoint (Consensus<?> cons, ServiceCheckpoint scp)`

5.49.2.4 `Consensus<TOMMessage[]> eu.tclouds.cheapbft.system.ConsensusManager.createConsensus (PrepareMessage prep) throws IOException` [protected]

5.49.2.5 `void eu.tclouds.cheapbft.system.ConsensusManager.forceCheckpoint ()`

5.49.2.6 `MessageBuilder eu.tclouds.cheapbft.system.ConsensusManager.getMsgBuilder ()`

5.49.2.7 `abstract String eu.tclouds.cheapbft.system.ConsensusManager.getName ()` [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMngr](#), and [eu.tclouds.cheapbft.system.minbft.-MinBFTConsensusMngr](#).

5.49.2.8 `long eu.tclouds.cheapbft.system.ConsensusManager.getNextPropID ()`

5.49.2.9 `void eu.tclouds.cheapbft.system.ConsensusManager.init (MessageBuilder builder)`

5.49.2.10 `void eu.tclouds.cheapbft.system.ConsensusManager.notifyReplySent (ServiceResult res, TOMMessage reply, MessageDigest digest)`

5.49.2.11 `void eu.tclouds.cheapbft.system.ConsensusManager.notifyRequestExecuted (ServiceResult res)`

5.49.2.12 `abstract int eu.tclouds.cheapbft.system.ConsensusManager.numberOfActiveReplicas ()` [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMngr](#), and [eu.tclouds.cheapbft.system.minbft.-MinBFTConsensusMngr](#).

5.49.2.13 `void eu.tclouds.cheapbft.system.ConsensusManager.receiveCheckpoint (CheckpointMessage chkPoint)`

5.49.2.14 `abstract void eu.tclouds.cheapbft.system.ConsensusManager.receiveCommit (CommitMessage commit)` [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMngr](#), and [eu.tclouds.cheapbft.system.minbft.-MinBFTConsensusMngr](#).

5.49.2.15 `abstract void eu.tclouds.cheapbft.system.ConsensusManager.receivePrepare (PrepareMessage prep)` [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMngr](#), and [eu.tclouds.cheapbft.system.minbft.-MinBFTConsensusMngr](#).

5.49.2.16 `abstract void eu.tclouds.cheapbft.system.ConsensusManager.receiveRequest (TOMMessage req)` [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMgr](#), and [eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMgr](#).

5.49.2.17 `void eu.tclouds.cheapbft.system.ConsensusManager.receiveSwitch (SwitchMessage sw)`

5.49.2.18 `void eu.tclouds.cheapbft.system.ConsensusManager.receiveUpdate (UpdateMessage upd)`

5.49.2.19 `void eu.tclouds.cheapbft.system.ConsensusManager.requestDecided (TOMMessage msg)`

5.49.2.20 `abstract void eu.tclouds.cheapbft.system.ConsensusManager.send (PrepareMessage msg)` [protected], [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.core.CheapConsensusMgr](#), and [eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMgr](#).

5.49.2.21 `void eu.tclouds.cheapbft.system.ConsensusManager.sendPrepare (byte[] reqs)` [protected]

5.49.2.22 `void eu.tclouds.cheapbft.system.ConsensusManager.switchFinished ()`

5.49.3 Member Data Documentation

5.49.3.1 `final CheckPointer eu.tclouds.cheapbft.system.ConsensusManager.checkPointer` [protected]

5.49.3.2 `int eu.tclouds.cheapbft.system.ConsensusManager.f` [protected]

Number of tolerated faults

5.49.3.3 `final Map<MessageCertificate, PrepareMessage> eu.tclouds.cheapbft.system.ConsensusManager.processing` [protected]

Initial value:

```
=
    new HashMap<MessageCertificate, PrepareMessage>()
```

currently processed messages

5.49.3.4 `final Map<Long, Consensus<TOMMessage[]> > eu.tclouds.cheapbft.system.ConsensusManager.startedConsensus = new HashMap<Long, Consensus<TOMMessage[]>>()` [protected]

started consensus instances

5.49.3.5 `boolean eu.tclouds.cheapbft.system.ConsensusManager.stopConsensus = false` [protected]

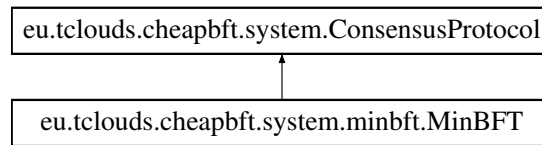
5.49.3.6 `TOMLayer eu.tclouds.cheapbft.system.ConsensusManager.tomlayer` [protected]

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

- `cheap/src/eu/tclouds/cheapbft/system/ConsensusManager.java`

5.50 eu.tclouds.cheapbft.system.ConsensusProtocol Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.ConsensusProtocol:

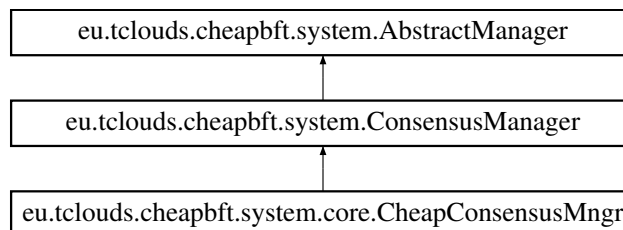


The documentation for this class was generated from the following file:

- cheap/src/eu/tclouds/cheapbft/system/ConsensusProtocol.java

5.51 eu.tclouds.cheapbft.system.core.CheapConsensusMngr Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.core.CheapConsensusMngr:



Public Member Functions

- CheapConsensusMngr (Integer processID, CommunicationLayerImpl com, TOMLayer tomLayer, int f, ReplicaRole role, CheckPointer cp, byte protocolID, long nextpropid)
- void init (MessageBuilder msgbuilder)
- void receivePrepare (PrepareMessage prepmsg)
- int numberOfActiveReplicas ()
- boolean isValidPrepare (PrepareMessage prep)
- void receiveUpdate (UpdateMessage up)
- void notifyReplySent (ServiceResult res, TOMMessage reply, MessageDigest digest)
- void receiveCommit (CommitMessage commit)
- void receiveRequest (TOMMessage req)
- void requestDecided (TOMMessage msg)
- void notifyRequestExecuted (ServiceResult res)
- void receiveCheckpoint (CheckpointMessage cp)
- void consensusDelivered (Consensus<?> cons)
- void receiveSwitch (SwitchMessage sw)
- void switchFinished ()
- boolean isLeader ()
- String getName ()

Protected Member Functions

- void beforeCheckpoint ()
- void send (PrepareMessage msg)

Package Attributes

- int [updateCount](#) = 0

Additional Inherited Members

5.51.1 Constructor & Destructor Documentation

- 5.51.1.1 `eu.tclouds.cheapbft.system.core.CheapConsensusMngr.CheapConsensusMngr (Integer processID, CommunicationLayerImpl com, TOMLayer tomlayer, int f, ReplicaRole role, CheckPointer cp, byte protocolID, long nextpropid)`

Parameters

<i>tomlayer</i>	
<i>com</i>	
<i>processID</i>	
<i>prMng</i>	is handling prepration phase of the protocol
<i>cmMng</i>	is handling comit phase of the protocol

5.51.2 Member Function Documentation

- 5.51.2.1 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.beforeCheckpoint () [protected]`

- 5.51.2.2 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.consensusDelivered (Consensus<?> cons)`

- 5.51.2.3 `String eu.tclouds.cheapbft.system.core.CheapConsensusMngr.getName () [virtual]`

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

- 5.51.2.4 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.init (MessageBuilder msgbuilder)`

- 5.51.2.5 `boolean eu.tclouds.cheapbft.system.core.CheapConsensusMngr.isLeader () [virtual]`

Implements [eu.tclouds.cheapbft.system.AbstractManager](#).

- 5.51.2.6 `boolean eu.tclouds.cheapbft.system.core.CheapConsensusMngr.isValidPrepare (PrepareMessage prep)`

- 5.51.2.7 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.notifyReplySent (ServiceResult res, TOMMessage reply, MessageDigest digest)`

- 5.51.2.8 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.notifyRequestExecuted (ServiceResult res)`

- 5.51.2.9 `int eu.tclouds.cheapbft.system.core.CheapConsensusMngr.numberOfActiveReplicas () [virtual]`

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

- 5.51.2.10 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.receiveCheckpoint (CheckpointMessage cp)`

- 5.51.2.11 `void eu.tclouds.cheapbft.system.core.CheapConsensusMngr.receiveCommit (CommitMessage commit) [virtual]`

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.51.2.12 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.receivePrepare (**PrepareMessage** *prepmg*)
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.51.2.13 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.receiveRequest (**TOMMessage** *req*)
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.51.2.14 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.receiveSwitch (**SwitchMessage** *sw*)

5.51.2.15 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.receiveUpdate (**UpdateMessage** *up*)

5.51.2.16 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.requestDecided (**TOMMessage** *msg*)

5.51.2.17 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.send (**PrepareMessage** *msg*) [protected],
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.51.2.18 void eu.tclouds.cheapbft.system.core.CheapConsensusMgr.switchFinished ()

5.51.3 Member Data Documentation

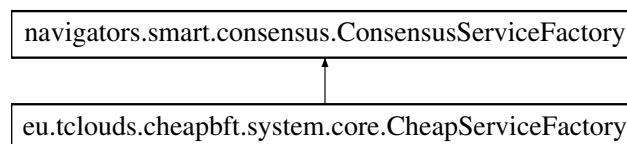
5.51.3.1 int eu.tclouds.cheapbft.system.core.CheapConsensusMgr.updateCount = 0 [package]

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

- cheap/src/eu/tclouds/cheapbft/system/core/CheapConsensusMgr.java

5.52 eu.tclouds.cheapbft.system.core.CheapServiceFactory Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.core.CheapServiceFactory:



Public Member Functions

- [ConsensusService](#) [newInstance](#) ([TOMLayer](#) *tomlayer*) throws [ConfigurationException](#)

5.52.1 Member Function Documentation

5.52.1.1 **ConsensusService** eu.tclouds.cheapbft.system.core.CheapServiceFactory.newInstance (**TOMLayer** *tomlayer*)
throws **ConfigurationException**

Creates a new Instance of a [ConsensusService](#)

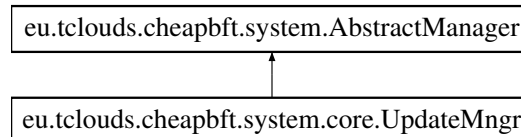
Implements [navigators.smart.consensus.ConsensusServiceFactory](#).

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

- cheap/src/eu/tclouds/cheapbft/system/core/CheapServiceFactory.java

5.53 eu.tclouds.cheapbft.system.core.UpdateMngr Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.core.UpdateMngr:



Public Member Functions

- [UpdateMngr](#) ([CommunicationLayerImpl com](#), Integer [processID](#), [ReplicaRole role](#), int [f](#), byte [protocolID](#), int [usehash](#))
- boolean [recieveEnoughUpdates](#) ([ReplicaStateUpdate up](#))
- [ReplicaStateUpdate createHash](#) ([ReplicaStateUpdate upstate](#))
- [ReplicaStateUpdate getAcceptedUpdate](#) (int [reqid](#))
- void [commitUpdate](#) ([ReplicaStateUpdate up](#))
- boolean [isLeader](#) ()

Additional Inherited Members

5.53.1 Constructor & Destructor Documentation

5.53.1.1 eu.tclouds.cheapbft.system.core.UpdateMngr.UpdateMngr ([CommunicationLayerImpl com](#), Integer [processID](#), [ReplicaRole role](#), int [f](#), byte [protocolID](#), int [usehash](#))

5.53.2 Member Function Documentation

5.53.2.1 void eu.tclouds.cheapbft.system.core.UpdateMngr.commitUpdate ([ReplicaStateUpdate up](#))

Parameters

up	
--------------------	--

5.53.2.2 [ReplicaStateUpdate](#) eu.tclouds.cheapbft.system.core.UpdateMngr.createHash ([ReplicaStateUpdate upstate](#))

5.53.2.3 [ReplicaStateUpdate](#) eu.tclouds.cheapbft.system.core.UpdateMngr.getAcceptedUpdate (int [reqid](#))

5.53.2.4 boolean eu.tclouds.cheapbft.system.core.UpdateMngr.isLeader () [virtual]

Implements [eu.tclouds.cheapbft.system.AbstractManager](#).

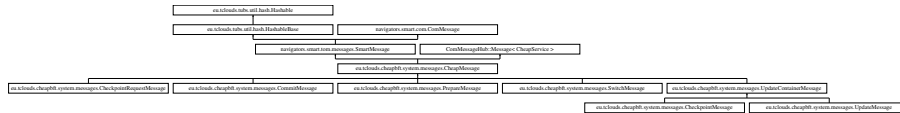
5.53.2.5 boolean eu.tclouds.cheapbft.system.core.UpdateMngr.recieveEnoughUpdates ([ReplicaStateUpdate up](#))

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

- `cheap/src/eu/tclouds/cheapbft/system/core/UpdateMngr.java`

5.54 eu.tclouds.cheapbft.system.messages.CheapMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.CheapMessage:



Classes

- enum [State](#)

Public Member Functions

- [CheapMessage](#) ([MessageBuilder](#) builder, byte typeid, int senderid, int protepoch)
- abstract void [process](#) ([CheapService](#) service)
- void [certify](#) ([CheapMessageCertifier](#) certifier)
- boolean [verify](#) ([CheapMessageCertifier](#) certifier)
- void [writeBodyTo](#) (ByteBuffer msgbuf)
- final int [getProtocolEpoch](#) ()
- abstract [MessageCertificate.CounterMode](#) [getCertMode](#) ()
- [MessageCertificate](#) [getCertificate](#) ()
- int [getPayloadSize](#) ()
- int [getCertificateSize](#) ()
- [State](#) [getState](#) ()
- String [toString](#) ()
- void [finish](#) ()

Protected Member Functions

- void [validateState](#) ([State](#) expected)
- void [doFinish](#) ()
- [CheapMessage](#) ([MessageBuilder](#) builder, byte typeid, ByteBuffer in)
- void [finalizeReading](#) (ByteBuffer in)
- byte[] [doCalcHash](#) ([MessageDigest](#) digest)
- void [writePayloadTo](#) ([MessageSink](#) sink)
- void [writeCertificateTo](#) ([MessageSink](#) sink)
- final [MessageBuilder](#) [getBuilder](#) ()

5.54.1 Constructor & Destructor Documentation

- 5.54.1.1 eu.tclouds.cheapbft.system.messages.CheapMessage.CheapMessage ([MessageBuilder](#) builder, byte typeid, int senderid, int protepoch)
- 5.54.1.2 eu.tclouds.cheapbft.system.messages.CheapMessage.CheapMessage ([MessageBuilder](#) builder, byte typeid, ByteBuffer in) [protected]

5.54.2 Member Function Documentation

5.54.2.1 void eu.tclouds.cheapbft.system.messages.CheapMessage.certify (CheapMessageCertifier *certifier*)

5.54.2.2 byte [] eu.tclouds.cheapbft.system.messages.CheapMessage.doCalcHash (MessageDigest *digest*)
[protected], [virtual]

Implements [eu.tclouds.tubs.util.hash.HashableBase](#).

5.54.2.3 void eu.tclouds.cheapbft.system.messages.CheapMessage.doFinish () [protected]

5.54.2.4 void eu.tclouds.cheapbft.system.messages.CheapMessage.finalizeReading (ByteBuffer *in*) [protected]

5.54.2.5 void eu.tclouds.cheapbft.system.messages.CheapMessage.finish ()

5.54.2.6 final MessageBuilder eu.tclouds.cheapbft.system.messages.CheapMessage.getBuilder () [protected]

5.54.2.7 MessageCertificate eu.tclouds.cheapbft.system.messages.CheapMessage.getCertificate ()

5.54.2.8 int eu.tclouds.cheapbft.system.messages.CheapMessage.getCertificateSize ()

5.54.2.9 abstract MessageCertificate.CounterMode eu.tclouds.cheapbft.system.messages.CheapMessage.getCertMode ()
[pure virtual]

Implemented in [eu.tclouds.cheapbft.system.messages.CheckpointMessage](#), [eu.tclouds.cheapbft.system.messages.PrepareMessage](#), [eu.tclouds.cheapbft.system.messages.CommitMessage](#), [eu.tclouds.cheapbft.system.messages.SwitchMessage](#), [eu.tclouds.cheapbft.system.messages.UpdateMessage](#), and [eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage](#).

5.54.2.10 int eu.tclouds.cheapbft.system.messages.CheapMessage.getPayloadSize ()

5.54.2.11 final int eu.tclouds.cheapbft.system.messages.CheapMessage.getProtocolEpoch ()

5.54.2.12 State eu.tclouds.cheapbft.system.messages.CheapMessage.getState ()

5.54.2.13 abstract void eu.tclouds.cheapbft.system.messages.CheapMessage.process (CheapService *service*) [pure virtual]

Implemented in [eu.tclouds.cheapbft.system.messages.PrepareMessage](#), [eu.tclouds.cheapbft.system.messages.CommitMessage](#), [eu.tclouds.cheapbft.system.messages.SwitchMessage](#), [eu.tclouds.cheapbft.system.messages.CheckpointMessage](#), [eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage](#), and [eu.tclouds.cheapbft.system.messages.UpdateMessage](#).

5.54.2.14 String eu.tclouds.cheapbft.system.messages.CheapMessage.toString ()

5.54.2.15 void eu.tclouds.cheapbft.system.messages.CheapMessage.validateState (State *expected*) [protected]

5.54.2.16 boolean eu.tclouds.cheapbft.system.messages.CheapMessage.verify (CheapMessageCertifier *certifier*)

5.54.2.17 void eu.tclouds.cheapbft.system.messages.CheapMessage.writeBodyTo (ByteBuffer *msgbuf*)

Implements [navigators.smart.com.ComMessage](#).

5.54.2.18 void eu.tclouds.cheapbft.system.messages.CheapMessage.writeCertificateTo (MessageSink sink)
[protected]

5.54.2.19 void eu.tclouds.cheapbft.system.messages.CheapMessage.writePayloadTo (MessageSink sink)
[protected]

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

- cheap/src/eu/tclouds/cheapbft/system/messages/CheapMessage.java

5.55 eu.tclouds.cheapbft.system.messages.CheapMessage.State Enum Reference

Public Attributes

- [Constructing](#)
- [Finished](#)
- [Certified](#)

5.55.1 Member Data Documentation

5.55.1.1 eu.tclouds.cheapbft.system.messages.CheapMessage.State.Certified

5.55.1.2 eu.tclouds.cheapbft.system.messages.CheapMessage.State.Constructing

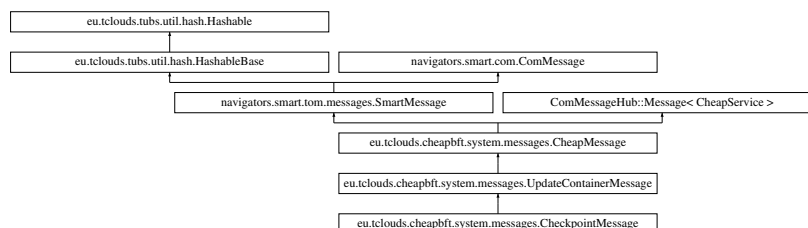
5.55.1.3 eu.tclouds.cheapbft.system.messages.CheapMessage.State.Finished

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

- cheap/src/eu/tclouds/cheapbft/system/messages/CheapMessage.java

5.56 eu.tclouds.cheapbft.system.messages.CheckpointMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.CheckpointMessage:



Public Member Functions

- [CheckpointMessage](#) ([MessageBuilder](#) builder, int senderid, int protepoch)
- void [process](#) ([CheapService](#) service)
- boolean [matches](#) ([CheckpointMessage](#) other)
- void [initState](#) (long consid, byte[] state, byte[] hash)
- void [finish](#) ()
- long [getConsensusID](#) ()
- byte[] [getServiceState](#) ()

- byte[] [getHash](#) ()
- [CounterMode](#) [getCertMode](#) ()
- String [toString](#) ()

Static Public Member Functions

- static [CheckpointMessage](#) [readFrom](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in)

Protected Member Functions

- [CheckpointMessage](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in)
- void [writePayloadTo](#) ([MessageSink](#) sink)
- void [doFinish](#) ()

5.56.1 Constructor & Destructor Documentation

5.56.1.1 eu.tclouds.cheapbft.system.messages.CheckpointMessage.CheckpointMessage ([MessageBuilder](#) builder, int senderid, int protepoch)

5.56.1.2 eu.tclouds.cheapbft.system.messages.CheckpointMessage.CheckpointMessage ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in) [protected]

5.56.2 Member Function Documentation

5.56.2.1 void eu.tclouds.cheapbft.system.messages.CheckpointMessage.doFinish () [protected]

5.56.2.2 void eu.tclouds.cheapbft.system.messages.CheckpointMessage.finish ()

5.56.2.3 [CounterMode](#) eu.tclouds.cheapbft.system.messages.CheckpointMessage.getCertMode () [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.56.2.4 long eu.tclouds.cheapbft.system.messages.CheckpointMessage.getConsensusID ()

5.56.2.5 byte [] eu.tclouds.cheapbft.system.messages.CheckpointMessage.getHash ()

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.56.2.6 byte [] eu.tclouds.cheapbft.system.messages.CheckpointMessage.getServiceState ()

5.56.2.7 void eu.tclouds.cheapbft.system.messages.CheckpointMessage.initState (long consid, byte[] state, byte[] hash)

5.56.2.8 boolean eu.tclouds.cheapbft.system.messages.CheckpointMessage.matches ([CheckpointMessage](#) other)

5.56.2.9 void eu.tclouds.cheapbft.system.messages.CheckpointMessage.process ([CheapService](#) service) [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.56.2.10 static [CheckpointMessage](#) eu.tclouds.cheapbft.system.messages.CheckpointMessage.readFrom ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in) [static]

5.56.2.11 String eu.tclouds.cheapbft.system.messages.CheckpointMessage.toString ()

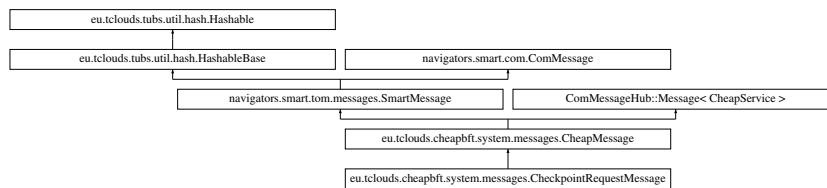
5.56.2.12 void eu.tclouds.cheapbft.system.messages.CheckpointMessage.writePayloadTo (MessageSink sink)
[protected]

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

- cheap/src/eu/tclouds/cheapbft/system/messages/CheckpointMessage.java

5.57 eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage:



Public Member Functions

- [CheckpointRequestMessage](#) ([MessageBuilder](#) builder, int senderid, int protepoch)
- void [process](#) ([CheapService](#) service)
- [CounterMode](#) [getCertMode](#) ()

Static Public Member Functions

- static [CheckpointRequestMessage](#) [readFrom](#) ([MessageBuilder](#) builder, ByteBuffer in)

Protected Member Functions

- [CheckpointRequestMessage](#) ([MessageBuilder](#) builder, ByteBuffer in)
- void [writePayloadTo](#) ([MessageSink](#) sink)

5.57.1 Constructor & Destructor Documentation

5.57.1.1 eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.CheckpointRequestMessage (MessageBuilder builder, int senderid, int protepoch)

5.57.1.2 eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.CheckpointRequestMessage (MessageBuilder builder, ByteBuffer in) [protected]

5.57.2 Member Function Documentation

5.57.2.1 CounterMode eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.getCertMode ()
[virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.57.2.2 void eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.process (CheapService service)
[virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.57.2.3 static CheckpointRequestMessage eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.readFrom (MessageBuilder builder, ByteBuffer in) [static]

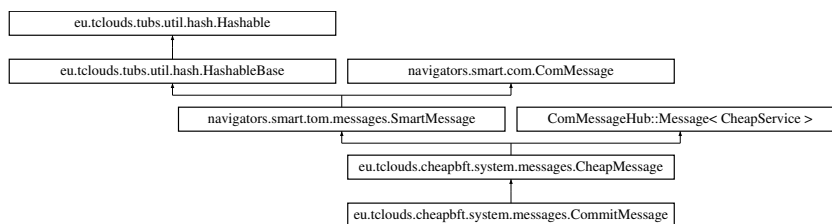
5.57.2.4 void eu.tclouds.cheapbft.system.messages.CheckpointRequestMessage.writePayloadTo (MessageSink sink)
[protected]

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

- cheap/src/eu/tclouds/cheapbft/system/messages/CheckpointRequestMessage.java

5.58 eu.tclouds.cheapbft.system.messages.CommitMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.CommitMessage:



Public Member Functions

- [CommitMessage](#) (MessageBuilder builder, int senderid, int protepoch, long consid, [MessageCertificate](#) pre-cert)
- void [process](#) (CheapService service)
- boolean [isValidFor](#) (PrepareMessage prepare)
- final long [getConsensusID](#) ()
- final [MessageCertificate](#) [getPrepareCertificate](#) ()
- CounterMode [getCertMode](#) ()
- int [getPayloadSize](#) ()
- String [toString](#) ()

Static Public Member Functions

- static [CommitMessage](#) [readFrom](#) (MessageBuilder builder, ByteBuffer in)

Protected Member Functions

- [CommitMessage](#) (MessageBuilder builder, ByteBuffer in)
- void [writePayloadTo](#) (MessageSink sink)

5.58.1 Constructor & Destructor Documentation

5.58.1.1 `eu.tclouds.cheapbft.system.messages.CommitMessage.CommitMessage (MessageBuilder builder, int senderid, int protepoch, long consid, MessageCertificate precert)`

5.58.1.2 `eu.tclouds.cheapbft.system.messages.CommitMessage.CommitMessage (MessageBuilder builder, ByteBuffer in)`
[protected]

5.58.2 Member Function Documentation

5.58.2.1 **CounterMode** `eu.tclouds.cheapbft.system.messages.CommitMessage.getCertMode ()` [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.58.2.2 `final long eu.tclouds.cheapbft.system.messages.CommitMessage.getConsensusID ()`

5.58.2.3 `int eu.tclouds.cheapbft.system.messages.CommitMessage.getPayloadSize ()`

5.58.2.4 `final MessageCertificate eu.tclouds.cheapbft.system.messages.CommitMessage.getPrepareCertificate ()`

5.58.2.5 `boolean eu.tclouds.cheapbft.system.messages.CommitMessage.isValidFor (PrepareMessage prepare)`

5.58.2.6 `void eu.tclouds.cheapbft.system.messages.CommitMessage.process (CheapService service)` [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.58.2.7 `static CommitMessage eu.tclouds.cheapbft.system.messages.CommitMessage.readFrom (MessageBuilder builder, ByteBuffer in)` [static]

5.58.2.8 `String eu.tclouds.cheapbft.system.messages.CommitMessage.toString ()`

5.58.2.9 `void eu.tclouds.cheapbft.system.messages.CommitMessage.writePayloadTo (MessageSink sink)`
[protected]

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/CommitMessage.java`

5.59 eu.tclouds.cheapbft.system.messages.MessageCertificate Class Reference

Classes

- enum [CounterMode](#)

Public Member Functions

- [MessageCertificate](#) (int procid, [CounterMode](#) mode, int ac, int pc, byte[] hmac)
- void [writeTo](#) ([MessageSink](#) sink)
- int [getProcessID](#) ()
- [CounterMode](#) [getMode](#) ()
- int [getAgreementCounter](#) ()
- int [getUpdateCounter](#) ()
- byte[] [getHMAC](#) ()

- int [getSize](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)
- String [toString](#) ()

Static Public Member Functions

- static [MessageCertificate readFrom](#) (ByteBuffer in)

5.59.1 Constructor & Destructor Documentation

- 5.59.1.1 `eu.tclouds.cheapbft.system.messages.MessageCertificate.MessageCertificate (int procid, CounterMode mode, int ac, int pc, byte[] hmac)`

5.59.2 Member Function Documentation

- 5.59.2.1 `boolean eu.tclouds.cheapbft.system.messages.MessageCertificate.equals (Object obj)`
- 5.59.2.2 `int eu.tclouds.cheapbft.system.messages.MessageCertificate.getAgreementCounter ()`
- 5.59.2.3 `byte [] eu.tclouds.cheapbft.system.messages.MessageCertificate.getHMAC ()`
- 5.59.2.4 `CounterMode eu.tclouds.cheapbft.system.messages.MessageCertificate.getMode ()`
- 5.59.2.5 `int eu.tclouds.cheapbft.system.messages.MessageCertificate.getProcessID ()`
- 5.59.2.6 `int eu.tclouds.cheapbft.system.messages.MessageCertificate.getSize ()`
- 5.59.2.7 `int eu.tclouds.cheapbft.system.messages.MessageCertificate.getUpdateCounter ()`
- 5.59.2.8 `int eu.tclouds.cheapbft.system.messages.MessageCertificate.hashCode ()`
- 5.59.2.9 `static MessageCertificate eu.tclouds.cheapbft.system.messages.MessageCertificate.readFrom (ByteBuffer in)`
[static]
- 5.59.2.10 `String eu.tclouds.cheapbft.system.messages.MessageCertificate.toString ()`
- 5.59.2.11 `void eu.tclouds.cheapbft.system.messages.MessageCertificate.writeTo (MessageSink sink)`

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/MessageCertificate.java`

5.60 eu.tclouds.cheapbft.system.messages.MessageCertificate.CounterMode Enum Reference

Public Attributes

- [AGREEMENT](#)
- [UPDATE](#)

5.60.1 Member Data Documentation

5.60.1.1 `eu.tclouds.cheapbft.system.messages.MessageCertificate.CounterMode.AGREEMENT`

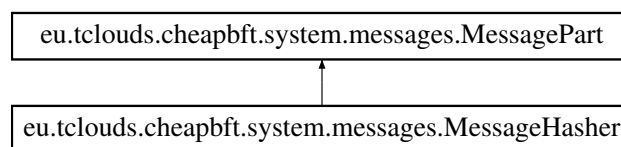
5.60.1.2 `eu.tclouds.cheapbft.system.messages.MessageCertificate.CounterMode.UPDATE`

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/MessageCertificate.java`

5.61 `eu.tclouds.cheapbft.system.messages.MessageHasher` Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.messages.MessageHasher`:



Public Member Functions

- void `add` (`MessagePart` part)
- void `calcHash` (`MessageDigest` digest)
- synchronized byte[] `getHash` ()
- boolean `useHash` ()
- byte[] `getData` ()

Additional Inherited Members

5.61.1 Member Function Documentation

5.61.1.1 void `eu.tclouds.cheapbft.system.messages.MessageHasher.add` (`MessagePart` part)

5.61.1.2 void `eu.tclouds.cheapbft.system.messages.MessageHasher.calcHash` (`MessageDigest` digest)

5.61.1.3 byte [] `eu.tclouds.cheapbft.system.messages.MessageHasher.getData` ()

5.61.1.4 synchronized byte [] `eu.tclouds.cheapbft.system.messages.MessageHasher.getHash` ()

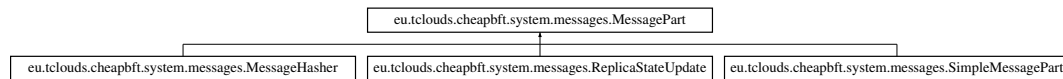
5.61.1.5 boolean `eu.tclouds.cheapbft.system.messages.MessageHasher.useHash` ()

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/MessageHasher.java`

5.62 `eu.tclouds.cheapbft.system.messages.MessagePart` Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.messages.MessagePart`:



Public Member Functions

- void [calcHash](#) (MessageDigest digest)
- synchronized void [initTasks](#) (HasherPool< [MessagePart](#) > pool)
- void [updateHash](#) (MessageDigest digest)
- synchronized byte[] [getData](#) ()
- synchronized boolean [hasData](#) ()
- synchronized byte[] [getHash](#) ()
- synchronized boolean [hasHash](#) ()
- synchronized boolean [useHash](#) ()

Protected Member Functions

- synchronized void [setData](#) (byte[] data)
- synchronized void [setHash](#) (byte[] hash)

5.62.1 Member Function Documentation

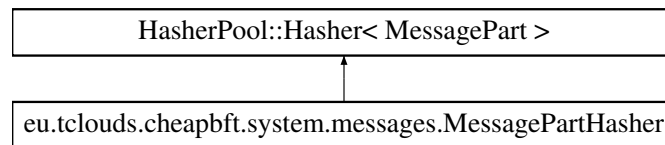
- 5.62.1.1 void eu.tclouds.cheapbft.system.messages.MessagePart.calcHash (MessageDigest *digest*)
- 5.62.1.2 synchronized byte [] eu.tclouds.cheapbft.system.messages.MessagePart.getData ()
- 5.62.1.3 synchronized byte [] eu.tclouds.cheapbft.system.messages.MessagePart.getHash ()
- 5.62.1.4 synchronized boolean eu.tclouds.cheapbft.system.messages.MessagePart.hasData ()
- 5.62.1.5 synchronized boolean eu.tclouds.cheapbft.system.messages.MessagePart.hasHash ()
- 5.62.1.6 synchronized void eu.tclouds.cheapbft.system.messages.MessagePart.initTasks (HasherPool< **MessagePart** > *pool*)
- 5.62.1.7 synchronized void eu.tclouds.cheapbft.system.messages.MessagePart.setData (byte[] *data*) [protected]
- 5.62.1.8 synchronized void eu.tclouds.cheapbft.system.messages.MessagePart.setHash (byte[] *hash*) [protected]
- 5.62.1.9 void eu.tclouds.cheapbft.system.messages.MessagePart.updateHash (MessageDigest *digest*)
- 5.62.1.10 synchronized boolean eu.tclouds.cheapbft.system.messages.MessagePart.useHash ()

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

- cheap/src/eu/tclouds/cheapbft/system/messages/MessagePart.java

5.63 eu.tclouds.cheapbft.system.messages.MessagePartHasher Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.MessagePartHasher:



Public Member Functions

- void [calcHash](#) ([MessagePart](#) task, MessageDigest digest)

5.63.1 Member Function Documentation

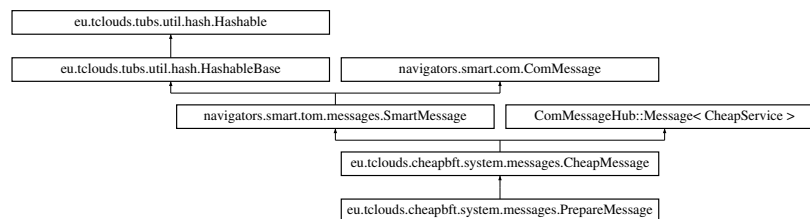
5.63.1.1 void eu.tclouds.cheapbft.system.messages.MessagePartHasher.calcHash ([MessagePart](#) task, MessageDigest digest)

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

- cheap/src/eu/tclouds/cheapbft/system/messages/MessagePartHasher.java

5.64 eu.tclouds.cheapbft.system.messages.PrepareMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.PrepareMessage:



Public Member Functions

- [PrepareMessage](#) ([MessageBuilder](#) msgbuilder, int senderid, int protepoch, long consid, byte[] propdata, boolean forcescp)
- void [process](#) ([CheapService](#) service)
- [CommitMessage](#) createCommit (int senderid)
- final long [getConsensusID](#) ()
- final byte[] [getProposalData](#) ()
- final boolean [forcesCheckpoint](#) ()
- [CounterMode](#) getCertMode ()
- int [getPayloadSize](#) ()
- String [toString](#) ()

Static Public Member Functions

- static [PrepareMessage](#) readFrom ([MessageBuilder](#) builder, ByteBuffer in)

Protected Member Functions

- [PrepareMessage](#) ([MessageBuilder](#) msgbuilder, [ByteBuffer](#) in)
- void [writePayloadTo](#) ([MessageSink](#) sink)

5.64.1 Constructor & Destructor Documentation

- 5.64.1.1 `eu.tclouds.cheapbft.system.messages.PrepareMessage.PrepareMessage (MessageBuilder msgbuilder, int senderid, int protepoch, long consid, byte[] propdata, boolean forcescp)`
- 5.64.1.2 `eu.tclouds.cheapbft.system.messages.PrepareMessage.PrepareMessage (MessageBuilder msgbuilder, ByteBuffer in)` `[protected]`

5.64.2 Member Function Documentation

- 5.64.2.1 `CommitMessage` `eu.tclouds.cheapbft.system.messages.PrepareMessage.createCommit (int senderid)`
- 5.64.2.2 `final boolean` `eu.tclouds.cheapbft.system.messages.PrepareMessage.forcesCheckpoint ()`
- 5.64.2.3 `CounterMode` `eu.tclouds.cheapbft.system.messages.PrepareMessage.getCertMode ()` `[virtual]`

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

- 5.64.2.4 `final long` `eu.tclouds.cheapbft.system.messages.PrepareMessage.getConsensusID ()`
- 5.64.2.5 `int` `eu.tclouds.cheapbft.system.messages.PrepareMessage.getPayloadSize ()`
- 5.64.2.6 `final byte []` `eu.tclouds.cheapbft.system.messages.PrepareMessage.getProposalData ()`
- 5.64.2.7 `void` `eu.tclouds.cheapbft.system.messages.PrepareMessage.process (CheapService service)` `[virtual]`

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

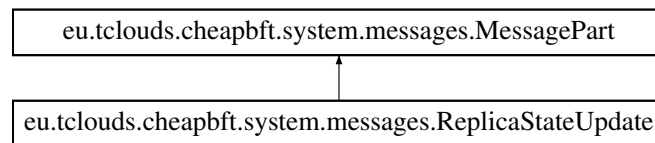
- 5.64.2.8 `static PrepareMessage` `eu.tclouds.cheapbft.system.messages.PrepareMessage.readFrom (MessageBuilder builder, ByteBuffer in)` `[static]`
- 5.64.2.9 `String` `eu.tclouds.cheapbft.system.messages.PrepareMessage.toString ()`
- 5.64.2.10 `void` `eu.tclouds.cheapbft.system.messages.PrepareMessage.writePayloadTo (MessageSink sink)` `[protected]`

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/PrepareMessage.java`

5.65 eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate`:



Public Member Functions

- [ReplicaStateUpdate](#) (int reqid, [ServiceReply](#) reply, boolean usereplyhash, [ServiceStateUpdate](#) update, boolean useupdhash)
- [ReplicaStateUpdate](#) createHashed (boolean usereplyhash, boolean useupdhash)
- [ReplicaStateUpdate](#) ([ServiceReplica](#) service, ByteBuffer in)
- void initHashTasks (HasherPool< [Hashable](#) > hasherpool)
- [MessageSink](#) writeTo ([MessageSink](#) sink)
- [ExtMessageDigest](#) updateHash ([ExtMessageDigest](#) digest)
- int getSize ()
- byte[] getUpdateHash ([MessageDigest](#) digest)
- void calcUpdateHash ([MessageDigest](#) digest)
- int hashCode ()
- String toString ()
- boolean equals (Object obj)
- boolean matches ([ReplicaStateUpdate](#) state)
- [ServiceReply](#) getReply ()
- boolean isReplyHash ()
- [ServiceStateUpdate](#) getUpdate ()
- boolean isUpdateHash ()
- int getReqId ()

Additional Inherited Members

5.65.1 Constructor & Destructor Documentation

- 5.65.1.1 `eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.ReplicaStateUpdate (int reqid, ServiceReply reply, boolean usereplyhash, ServiceStateUpdate update, boolean useupdhash)`
- 5.65.1.2 `eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.ReplicaStateUpdate (ServiceReplica service, ByteBuffer in)`

5.65.2 Member Function Documentation

- 5.65.2.1 `void eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.calcUpdateHash (MessageDigest digest)`
- 5.65.2.2 `ReplicaStateUpdate eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.createHashed (boolean usereplyhash, boolean useupdhash)`
- 5.65.2.3 `boolean eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.equals (Object obj)`
- 5.65.2.4 `ServiceReply eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.getReply ()`
- 5.65.2.5 `int eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.getReqId ()`
- 5.65.2.6 `int eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.getSize ()`

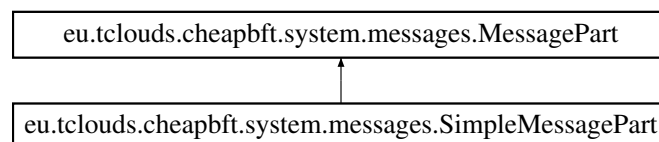
- 5.65.2.7 **ServiceStateUpdate** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.getUpdate ()
- 5.65.2.8 **byte []** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.getUpdateHash (*MessageDigest digest*)
- 5.65.2.9 **int** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.hashCode ()
- 5.65.2.10 **void** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.initHashTasks (*HasherPool< Hashable > hasherpool*)
- 5.65.2.11 **boolean** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.isReplyHash ()
- 5.65.2.12 **boolean** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.isUpdateHash ()
- 5.65.2.13 **boolean** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.matches (*ReplicaStateUpdate state*)
- 5.65.2.14 **String** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.toString ()
- 5.65.2.15 **ExtMessageDigest** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.updateHash (*ExtMessageDigest digest*)
- 5.65.2.16 **MessageSink** eu.tclouds.cheapbft.system.messages.ReplicaStateUpdate.writeTo (*MessageSink sink*)

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

- cheap/src/eu/tclouds/cheapbft/system/messages/ReplicaStateUpdate.java

5.66 eu.tclouds.cheapbft.system.messages.SimpleMessagePart Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.SimpleMessagePart:



Public Member Functions

- [SimpleMessagePart](#) (byte[] data)

Additional Inherited Members

5.66.1 Constructor & Destructor Documentation

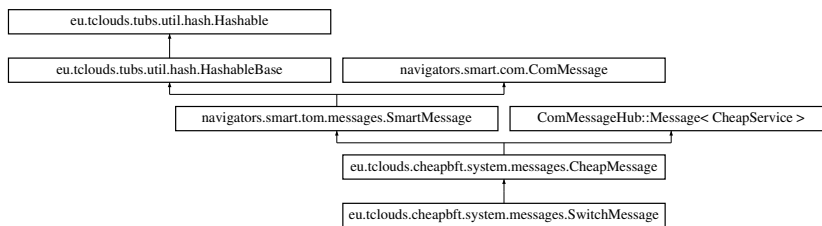
- 5.66.1.1 eu.tclouds.cheapbft.system.messages.SimpleMessagePart.SimpleMessagePart (byte[] data)

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

- cheap/src/eu/tclouds/cheapbft/system/messages/SimpleMessagePart.java

5.67 eu.tclouds.cheapbft.system.messages.SwitchMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.SwitchMessage:



Public Member Functions

- [SwitchMessage](#) ([MessageBuilder](#) builder, int senderid, int protepoch, int type, long consid, int reqid)
- void [process](#) ([CheapService](#) service)
- final int [getType](#) ()
- final long [getConsensusID](#) ()
- final int [getRequestID](#) ()
- [CounterMode](#) [getCertMode](#) ()
- int [getPayloadSize](#) ()
- String [toString](#) ()

Static Public Member Functions

- static [SwitchMessage](#) [readFrom](#) ([MessageBuilder](#) builder, [ByteBuffer](#) in)

Protected Member Functions

- [SwitchMessage](#) ([MessageBuilder](#) builder, [ByteBuffer](#) in)
- void [writePayloadTo](#) ([MessageSink](#) sink)

5.67.1 Constructor & Destructor Documentation

5.67.1.1 eu.tclouds.cheapbft.system.messages.SwitchMessage.SwitchMessage ([MessageBuilder](#) builder, int senderid, int protepoch, int type, long consid, int reqid)

5.67.1.2 eu.tclouds.cheapbft.system.messages.SwitchMessage.SwitchMessage ([MessageBuilder](#) builder, [ByteBuffer](#) in)
[protected]

5.67.2 Member Function Documentation

5.67.2.1 [CounterMode](#) eu.tclouds.cheapbft.system.messages.SwitchMessage.getCertMode () [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.67.2.2 final long eu.tclouds.cheapbft.system.messages.SwitchMessage.getConsensusID ()

5.67.2.3 int eu.tclouds.cheapbft.system.messages.SwitchMessage.getPayloadSize ()

5.67.2.4 final int eu.tclouds.cheapbft.system.messages.SwitchMessage.getRequestID ()

5.67.2.5 final int eu.tclouds.cheapbft.system.messages.SwitchMessage.getType ()

5.67.2.6 void eu.tclouds.cheapbft.system.messages.SwitchMessage.process (CheapService service) [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.67.2.7 static SwitchMessage eu.tclouds.cheapbft.system.messages.SwitchMessage.readFrom (MessageBuilder builder, ByteBuffer in) [static]

5.67.2.8 String eu.tclouds.cheapbft.system.messages.SwitchMessage.toString ()

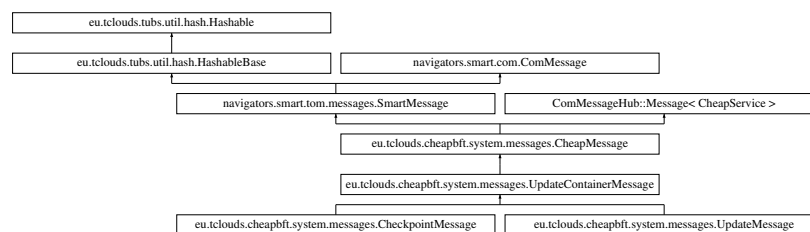
5.67.2.9 void eu.tclouds.cheapbft.system.messages.SwitchMessage.writePayloadTo (MessageSink sink) [protected]

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

- [cheap/src/eu/tclouds/cheapbft/system/messages/SwitchMessage.java](#)

5.68 eu.tclouds.cheapbft.system.messages.UpdateContainerMessage Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.messages.UpdateContainerMessage:



Classes

- enum [IncludeMode](#)

Public Member Functions

- [UpdateContainerMessage](#) (MessageBuilder builder, byte typeid, int senderid, int protepoch)
- void [add](#) (ReplicaStateUpdate state)
- int [getNumberOfUpdates](#) ()
- int [getPayloadSize](#) ()
- List< [ReplicaStateUpdate](#) > [getStates](#) ()

Protected Member Functions

- [UpdateContainerMessage](#) (MessageBuilder builder, ServiceReplica service, byte typeid, ByteBuffer in)
- void [writePayloadTo](#) (MessageSink sink)
- void [addMsgSize](#) (int value)
- void [doFinish](#) ()

5.68.1 Constructor & Destructor Documentation

5.68.1.1 `eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.UpdateContainerMessage (MessageBuilder builder, byte typeid, int senderid, int protepoch)`

5.68.1.2 `eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.UpdateContainerMessage (MessageBuilder builder, ServiceReplica service, byte typeid, ByteBuffer in)` [protected]

5.68.2 Member Function Documentation

5.68.2.1 `void eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.add (ReplicaStateUpdate state)`

5.68.2.2 `void eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.addMsgSize (int value)` [protected]

5.68.2.3 `void eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.doFinish ()` [protected]

5.68.2.4 `int eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.getNumberOfUpdates ()`

5.68.2.5 `int eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.getPayloadSize ()`

5.68.2.6 `List<ReplicaStateUpdate> eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.getStates ()`

5.68.2.7 `void eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.writePayloadTo (MessageSink sink)` [protected]

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/UpdateContainerMessage.java`

5.69 eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.IncludeMode Enum Reference

Public Attributes

- [DoNotInclude](#)
- [IncludeFull](#)
- [IncludeHash](#)

5.69.1 Member Data Documentation

5.69.1.1 `eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.IncludeMode.DoNotInclude`

5.69.1.2 `eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.IncludeMode.IncludeFull`

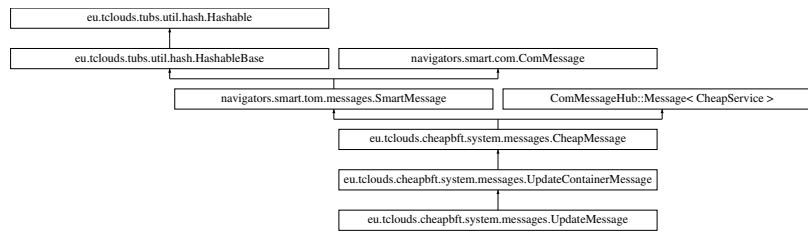
5.69.1.3 `eu.tclouds.cheapbft.system.messages.UpdateContainerMessage.IncludeMode.IncludeHash`

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/UpdateContainerMessage.java`

5.70 eu.tclouds.cheapbft.system.messages.UpdateMessage Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.messages.UpdateMessage`:



Public Member Functions

- [UpdateMessage](#) ([MessageBuilder](#) builder, int senderid, int protepoch)
- void [process](#) ([CheapService](#) service)
- MessageCertificate.CounterMode [getCertMode](#) ()
- void [finish](#) ()
- String [toString](#) ()

Static Public Member Functions

- static [UpdateMessage](#) [readFrom](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in)

Protected Member Functions

- [UpdateMessage](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in)

5.70.1 Constructor & Destructor Documentation

5.70.1.1 [eu.tclouds.cheapbft.system.messages.UpdateMessage.UpdateMessage](#) ([MessageBuilder](#) builder, int senderid, int protepoch)

5.70.1.2 [eu.tclouds.cheapbft.system.messages.UpdateMessage.UpdateMessage](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in) [protected]

5.70.2 Member Function Documentation

5.70.2.1 void [eu.tclouds.cheapbft.system.messages.UpdateMessage.finish](#) ()

5.70.2.2 MessageCertificate.CounterMode [eu.tclouds.cheapbft.system.messages.UpdateMessage.getCertMode](#) ()
[virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.70.2.3 void [eu.tclouds.cheapbft.system.messages.UpdateMessage.process](#) ([CheapService](#) service) [virtual]

Implements [eu.tclouds.cheapbft.system.messages.CheapMessage](#).

5.70.2.4 static [UpdateMessage](#) [eu.tclouds.cheapbft.system.messages.UpdateMessage.readFrom](#) ([MessageBuilder](#) builder, [ServiceReplica](#) service, ByteBuffer in) [static]

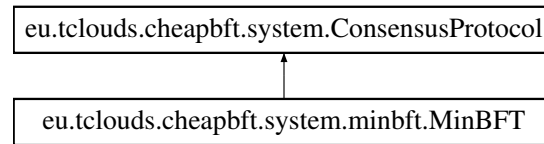
5.70.2.5 String [eu.tclouds.cheapbft.system.messages.UpdateMessage.toString](#) ()

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

- `cheap/src/eu/tclouds/cheapbft/system/messages/UpdateMessage.java`

5.71 eu.tclouds.cheapbft.system.minbft.MinBFT Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.minbft.MinBFT:



Public Member Functions

- `MinBFT` (`CheapService` service, `TOMLayer` tomlayer, int protepoch, List< Integer > view) throws `ConfigurationException`
- int `getProposer` (long consid)
- boolean `isProposer` ()
- void `requestExecuted` (`ServiceResult` res)
- void `consensusDelivered` (long consid)
- void `createCheckpoint` ()
- void `proposeRequests` ()
- void `processPrepareMessage` (`PrepareMessage` prepare)
- void `processCommitMessage` (`CommitMessage` commit)
- void `processUpdateMessage` (`UpdateMessage` updmmsg)
- void `processCheckpointMessage` (`CheckpointMessage` cpmsg)

5.71.1 Constructor & Destructor Documentation

- 5.71.1.1 `eu.tclouds.cheapbft.system.minbft.MinBFT.MinBFT (CheapService service, TOMLayer tomlayer, int protepoch, List< Integer > view)` throws `ConfigurationException`

5.71.2 Member Function Documentation

- 5.71.2.1 void `eu.tclouds.cheapbft.system.minbft.MinBFT.consensusDelivered (long consid)`
- 5.71.2.2 void `eu.tclouds.cheapbft.system.minbft.MinBFT.createCheckpoint ()`
- 5.71.2.3 int `eu.tclouds.cheapbft.system.minbft.MinBFT.getProposer (long consid)`
- 5.71.2.4 boolean `eu.tclouds.cheapbft.system.minbft.MinBFT.isProposer ()`
- 5.71.2.5 void `eu.tclouds.cheapbft.system.minbft.MinBFT.processCheckpointMessage (CheckpointMessage cpmsg)`
- 5.71.2.6 void `eu.tclouds.cheapbft.system.minbft.MinBFT.processCommitMessage (CommitMessage commit)`
- 5.71.2.7 void `eu.tclouds.cheapbft.system.minbft.MinBFT.processPrepareMessage (PrepareMessage prepare)`
- 5.71.2.8 void `eu.tclouds.cheapbft.system.minbft.MinBFT.processUpdateMessage (UpdateMessage updmmsg)`
- 5.71.2.9 void `eu.tclouds.cheapbft.system.minbft.MinBFT.proposeRequests ()`

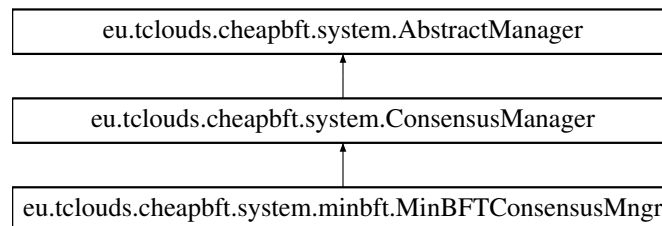
5.71.2.10 void eu.tclouds.cheapbft.system.minbft.MinBFT.requestExecuted (*ServiceResult res*)

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

- cheap/src/eu/tclouds/cheapbft/system/minbft/MinBFT.java

5.72 eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr Class Reference

Inheritance diagram for eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr:



Public Member Functions

- [MinBFTConsensusMngr](#) (Integer [processID](#), [CommunicationLayerImpl](#) [com](#), [TOMLayer](#) [tomlayer](#), int [f](#), [ReplicaRole](#) [role](#), [CheckPointer](#) [cp](#), byte [protocolID](#), long [nextpropid](#))
- int [numberOfActiveReplicas](#) ()
- boolean [isLeader](#) ()
- void [receivePrepare](#) ([PrepareMessage](#) [prep](#))
- void [receiveCommit](#) ([CommitMessage](#) [commit](#))
- void [receiveRequest](#) ([TOMMessage](#) [req](#))
- String [getName](#) ()

Protected Member Functions

- void [send](#) ([PrepareMessage](#) [msg](#))

Additional Inherited Members

5.72.1 Constructor & Destructor Documentation

5.72.1.1 eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.MinBFTConsensusMngr (Integer *processID*, *CommunicationLayerImpl com*, *TOMLayer tomlayer*, int *f*, *ReplicaRole role*, *CheckPointer cp*, byte *protocolID*, long *nextpropid*)

5.72.2 Member Function Documentation

5.72.2.1 String eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.getName () [virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.72.2.2 boolean eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.isLeader () [virtual]

Implements [eu.tclouds.cheapbft.system.AbstractManager](#).

5.72.2.3 `int eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.numberOfActiveReplicas ()` [virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.72.2.4 `void eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.receiveCommit (CommitMessage commit)`
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.72.2.5 `void eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.receivePrepare (PrepareMessage prep)`
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.72.2.6 `void eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.receiveRequest (TOMMessage req)`
[virtual]

Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

5.72.2.7 `void eu.tclouds.cheapbft.system.minbft.MinBFTConsensusMngr.send (PrepareMessage msg)`
[protected], [virtual]

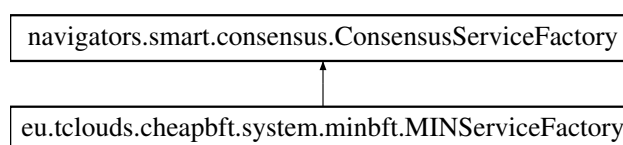
Implements [eu.tclouds.cheapbft.system.ConsensusManager](#).

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

- `cheap/src/eu/tclouds/cheapbft/system/minbft/MinBFTConsensusMngr.java`

5.73 eu.tclouds.cheapbft.system.minbft.MINServiceFactory Class Reference

Inheritance diagram for `eu.tclouds.cheapbft.system.minbft.MINServiceFactory`:



Public Member Functions

- [ConsensusService newInstance](#) ([TOMLayer tomlayer](#)) throws `ConfigurationException`

5.73.1 Member Function Documentation

5.73.1.1 `ConsensusService eu.tclouds.cheapbft.system.minbft.MINServiceFactory.newInstance (TOMLayer tomlayer)`
throws `ConfigurationException`

Creates a new Instance of a `ConsensusService`

Implements [navigators.smart.consensus.ConsensusServiceFactory](#).

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

- cheap/src/eu/tclouds/cheapbft/system/minbft/MINServiceFactory.java

5.74 eu.tclouds.cheapbft.system.ReplicaRole Enum Reference

Public Attributes

- [LEADER](#)
- [ACTIVE](#)
- [PASSIVE](#)

5.74.1 Member Data Documentation

5.74.1.1 eu.tclouds.cheapbft.system.ReplicaRole.ACTIVE

5.74.1.2 eu.tclouds.cheapbft.system.ReplicaRole.LEADER

5.74.1.3 eu.tclouds.cheapbft.system.ReplicaRole.PASSIVE

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

- cheap/src/eu/tclouds/cheapbft/system/ReplicaRole.java

5.75 eu.tclouds.cheapbft.system.SequenceValidator Class Reference

Public Member Functions

- void [validateSequence](#) ([ReplicaRole](#) role, [CheapMessage](#) msg) throws IOException

5.75.1 Member Function Documentation

5.75.1.1 void eu.tclouds.cheapbft.system.SequenceValidator.validateSequence ([ReplicaRole](#) *role*, [CheapMessage](#) *msg*) throws IOException

Parameters

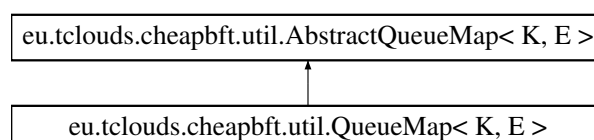
<i>role</i>	If no role is given, it can be only checked whether the sequence makes sense. For a definite validation, the role of the local replica is mandatory.
-------------	--

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

- cheap/src/eu/tclouds/cheapbft/system/SequenceValidator.java

5.76 eu.tclouds.cheapbft.util.AbstractQueueMap< K, E > Class Reference

Inheritance diagram for eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >:



Public Member Functions

- [AbstractQueueMap](#) (Map< K, Queue< E >> [map](#))
- synchronized E [removeNextElement](#) (K key)
- synchronized void [addElement](#) (final K key, final E element)
- synchronized boolean [contains](#) (final K key, final E element)
- synchronized E [peek](#) (final K key)
- synchronized int [elementCount](#) (final K key)
- Iterator< Queue< E > > [iterator](#) ()
- Queue< E > [removeAllElements](#) (K key)
- Queue< E > [getAllElements](#) (K key)
- void [addAllElements](#) (K key, Queue< E > elements)
- Set< K > [keySet](#) ()
- E [removeElement](#) (K key, E element)
- boolean [isEmpty](#) ()
- void [clear](#) ()
- void [debugQueueMap](#) (Logger log, String prefix, Level level)

Protected Attributes

- final Map< K, Queue< E > > [map](#)

5.76.1 Detailed Description

Implements a Map that holds queues of elements instead of a single K.

5.76.2 Constructor & Destructor Documentation

5.76.2.1 `eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.AbstractQueueMap (Map< K, Queue< E >> map)`

5.76.3 Member Function Documentation

5.76.3.1 `void eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.addAllElements (K key, Queue< E > elements)`

Adds all given elements to the internal queue

Parameters

<i>key</i>	
<i>elements</i>	

5.76.3.2 `synchronized void eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.addElement (final K key, final E element)`

Adds the Element to the corresponding queue in the map. If there is no such queue a new one is created before.

Parameters

<i>key</i>	The key for the element
<i>element</i>	The element to add

5.76.3.3 `void eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.clear ()`

5.76.3.4 `synchronized boolean eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.contains (final K key, final E element)`

Checks if the given element is in the queue of the given key.

Parameters

<i>key</i>	The key that this element is linked to
<i>element</i>	The element to find

Returns

True if the element is already contained in the list, false otherwise

5.76.3.5 `void eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.debugQueueMap (Logger log, String prefix, Level level)`

5.76.3.6 `synchronized int eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.elementCount (final K key)`

5.76.3.7 `Queue<E> eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.getAllElements (K key)`

Returns and removes all elements from the map.

Parameters

<i>key</i>	The keyfor the elements
------------	-------------------------

Returns

the queue with all elementes for this key, though the list maybe empty

5.76.3.8 `boolean eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.isEmpty ()`

5.76.3.9 `Iterator<Queue<E> > eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.iterator ()`

Returns an iterator of the queues in the map.

Returns

The iterator

5.76.3.10 `Set<K> eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.keySet ()`

5.76.3.11 `synchronized E eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.peek (final K key)`

5.76.3.12 `Queue<E> eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.removeAllElements (K key)`

Returns and removes all elements from the map.

Parameters

<i>key</i>	The keyfor the elements
------------	-------------------------

Returns

the queue with all elementes for this key, though the list maybe empty

5.76.3.13 `E eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.removeElement (K key, E element)`

Removes and returns the element that was stored in the list and is equal to the give element (the returned element must not be the identical one)

Parameters

<i>key</i>	the key for the list
<i>element</i>	the element we look for

Returns

the element that is equal to the given one or null if none is found

5.76.3.14 `synchronized E eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.removeNextElement (K key)`

Returns and removes the first element of the lock context queue for the given key if there is one - otherwise null is returned

Parameters

<i>key</i>	of the queue where to get the element
------------	---------------------------------------

Returns

The removed element if there was one

5.76.4 Member Data Documentation

5.76.4.1 `final Map<K,Queue<E> > eu.tclouds.cheapbft.util.AbstractQueueMap< K, E >.map` [protected]

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

- cheap/src/eu/tclouds/cheapbft/util/AbstractQueueMap.java

5.77 eu.tclouds.cheapbft.util.ArraysHelper Class Reference

Static Public Member Functions

- static boolean [equals](#) (byte[] a, int index, int length, byte[] b)

5.77.1 Detailed Description

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Author

tags

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5.77.2 Member Function Documentation

5.77.2.1 static boolean eu.tclouds.cheapbft.util.ArraysHelper.equals (byte[] *a*, int *index*, int *length*, byte[] *b*) [static]

Compares the next *length* elements in array *a* with the corresponding element starting at zero in array *b*

Parameters

<i>a</i>	The first array
<i>index</i>	The index where to begin the comparison
<i>length</i>	The number of elements to be compared
<i>b</i>	The second array which has to have length <i>length</i>

Returns

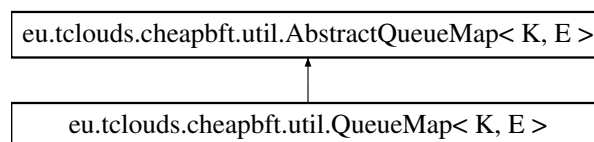
true if all the elements equal, false otherwise

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

- cheap/src/eu/tclouds/cheapbft/util/ArraysHelper.java

5.78 eu.tclouds.cheapbft.util.QueueMap< K, E > Class Reference

Inheritance diagram for eu.tclouds.cheapbft.util.QueueMap< K, E >:



Public Member Functions

- [QueueMap](#) ()

Additional Inherited Members

5.78.1 Detailed Description

Implements a Map that holds queues of elements E instead of a single one.

5.78.2 Constructor & Destructor Documentation

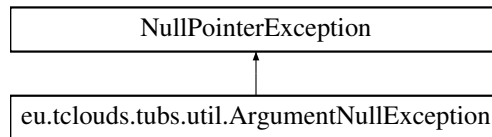
5.78.2.1 eu.tclouds.cheapbft.util.QueueMap< K, E >.QueueMap ()

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

- [cheap/src/eu/tclouds/cheapbft/util/QueueMap.java](#)

5.79 eu.tclouds.tubs.util.ArgumentNullException Class Reference

Inheritance diagram for eu.tclouds.tubs.util.ArgumentNullException:



Public Member Functions

- [ArgumentNullException](#) (String param)

5.79.1 Constructor & Destructor Documentation

5.79.1.1 eu.tclouds.tubs.util.ArgumentNullException.ArgumentNullException (String param)

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

- [modular-smart/src/eu/tclouds/tubs/util/ArgumentNullException.java](#)

5.80 eu.tclouds.tubs.util.Convert Class Reference

Static Public Member Functions

- static Boolean [tryParseBoolean](#) (String s)
- static boolean [parseBoolean](#) (String s) throws NumberFormatException
- static Integer [tryParseInteger](#) (String s)
- static byte[] [toByteArray](#) (long v)
- static String [toHexString](#) (byte[] bytes)
- static String [toHexString](#) (byte[] bytes, int off, int len)

5.80.1 Member Function Documentation

5.80.1.1 static boolean eu.tclouds.tubs.util.Convert.parseBoolean (String s) throws NumberFormatException [static]

5.80.1.2 static byte [] eu.tclouds.tubs.util.Convert.toByteArray (long v) [static]

5.80.1.3 static String eu.tclouds.tubs.util.Convert.toHexString (byte[] bytes) [static]

5.80.1.4 static String eu.tclouds.tubs.util.Convert.toHexString (byte[] bytes, int off, int len) [static]

5.80.1.5 static Boolean eu.tclouds.tubs.util.Convert.tryParseBoolean (String s) [static]

5.80.1.6 static Integer eu.tclouds.tubs.util.Convert.tryParseInteger (String s) [static]

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

- [modular-smart/src/eu/tclouds/tubs/util/Convert.java](#)

5.81 eu.tclouds.tubs.util.DateHelper Class Reference

Static Public Member Functions

- static String [getDefaultString](#) (Date date)
- static String [getDefaultMillisString](#) (Date date)

Static Public Attributes

- static final long [NanosMillis](#) = 1000000L
- static final String [FormatDefault](#) = "%1\$tY-%1\$tm-%1\$td %1\$tH:%1\$tM:%1\$tS"
- static final String [FormatDefaultMillis](#) = "%1\$tY-%1\$tm-%1\$td %1\$tH:%1\$tM:%1\$tS.%1\$tL"

Protected Member Functions

- [DateHelper](#) ()

5.81.1 Constructor & Destructor Documentation

5.81.1.1 `eu.tclouds.tubs.util.DateHelper.DateHelper ()` [protected]

5.81.2 Member Function Documentation

5.81.2.1 `static String eu.tclouds.tubs.util.DateHelper.getDefaultMillisString (Date date)` [static]

5.81.2.2 `static String eu.tclouds.tubs.util.DateHelper.getDefaultString (Date date)` [static]

5.81.3 Member Data Documentation

5.81.3.1 `final String eu.tclouds.tubs.util.DateHelper.FormatDefault = "%1$tY-%1$tm-%1$td %1$tH:%1$tM:%1$tS"` [static]

5.81.3.2 `final String eu.tclouds.tubs.util.DateHelper.FormatDefaultMillis = "%1$tY-%1$tm-%1$td %1$tH:%1$tM:%1$tS.%1$tL"` [static]

5.81.3.3 `final long eu.tclouds.tubs.util.DateHelper.NanosMillis = 1000000L` [static]

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

- modular-smart/src/eu/tclouds/tubs/util/DateHelper.java

5.82 eu.tclouds.tubs.util.ExceptionHelper Class Reference

Static Public Member Functions

- static String [getStackTrace](#) (Throwable t)
- static String [getStackTrace](#) (Throwable t, String prefix)
- static void [NotExpectedState](#) (Throwable t)
- static IllegalStateException [createNotExpectedState](#) (Throwable t)

5.82.1 Member Function Documentation

5.82.1.1 `static IllegalStateException eu.tclouds.tubs.util.ExceptionHelper.createNotExpectedState (Throwable t)`
[static]

5.82.1.2 `static String eu.tclouds.tubs.util.ExceptionHelper.getStackTrace (Throwable t)` [static]

5.82.1.3 `static String eu.tclouds.tubs.util.ExceptionHelper.getStackTrace (Throwable t, String prefix)` [static]

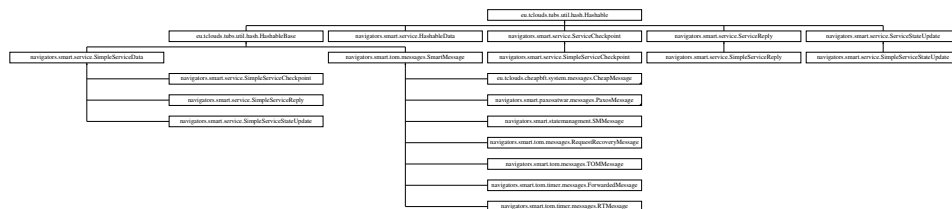
5.82.1.4 `static void eu.tclouds.tubs.util.ExceptionHelper.NotExpectedState (Throwable t)` [static]

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

- modular-smart/src/eu/tclouds/tubs/util/ExceptionHelper.java

5.83 eu.tclouds.tubs.util.hash.Hashable Interface Reference

Inheritance diagram for eu.tclouds.tubs.util.hash.Hashable:



Public Member Functions

- boolean `hasHash ()`
- byte[] `getHash ()`
- byte[] `getHash (MessageDigest digest)`
- boolean `calcHash (MessageDigest digest)`
- boolean `matchesHashOf (Hashable other)`

5.83.1 Member Function Documentation

5.83.1.1 `boolean eu.tclouds.tubs.util.hash.Hashable.calcHash (MessageDigest digest)`

Implemented in [eu.tclouds.tubs.util.hash.HashableBase](#).

5.83.1.2 `byte [] eu.tclouds.tubs.util.hash.Hashable.getHash ()`

Implemented in [navigators.smart.tom.messages.RequestRecoveryMessage](#), [eu.tclouds.cheapbft.system.messages.CheckpointMessage](#), and [eu.tclouds.tubs.util.hash.HashableBase](#).

5.83.1.3 `byte [] eu.tclouds.tubs.util.hash.Hashable.getHash (MessageDigest digest)`

Implemented in [eu.tclouds.tubs.util.hash.HashableBase](#).

5.83.1.4 boolean eu.tclouds.tubs.util.hash.Hashable.hasHash ()

Implemented in [eu.tclouds.tubs.util.hash.HashableBase](#).

5.83.1.5 boolean eu.tclouds.tubs.util.hash.Hashable.matchesHashOf (Hashable other)

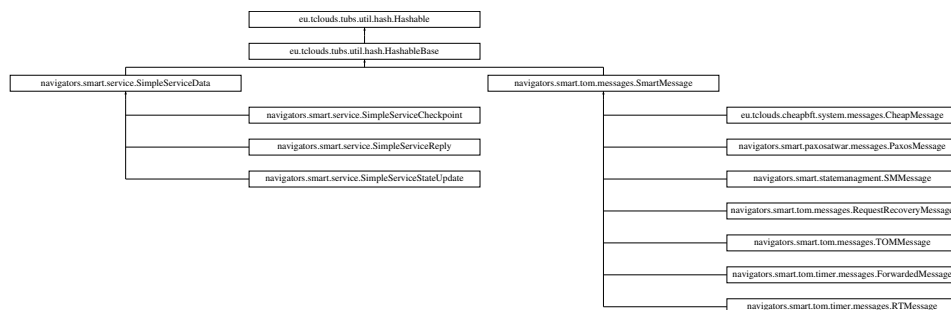
Implemented in [eu.tclouds.tubs.util.hash.HashableBase](#).

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

- modular-smart/src/eu/tclouds/tubs/util/hash/Hashable.java

5.84 eu.tclouds.tubs.util.hash.HashableBase Class Reference

Inheritance diagram for eu.tclouds.tubs.util.hash.HashableBase:



Public Member Functions

- [HashableBase](#) ()
- boolean [hasHash](#) ()
- byte[] [getHash](#) ()
- byte[] [getHash](#) (MessageDigest digest)
- boolean [matchesHashOf](#) (Hashable other)
- boolean [calcHash](#) (MessageDigest digest)

Protected Member Functions

- byte[] [doGetHash](#) (MessageDigest digest)
- abstract byte[] [doCalcHash](#) (MessageDigest digest)
- void [initHash](#) (byte[] hash)

5.84.1 Constructor & Destructor Documentation

5.84.1.1 eu.tclouds.tubs.util.hash.HashableBase.HashableBase ()

5.84.2 Member Function Documentation

5.84.2.1 boolean eu.tclouds.tubs.util.hash.HashableBase.calcHash (MessageDigest digest)

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.84.2.2 `abstract byte [] eu.tclouds.tubs.util.hash.HashableBase.doCalcHash (MessageDigest digest)` [protected],
[pure virtual]

Implemented in [eu.tclouds.cheapbft.system.messages.CheapMessage](#), [navigators.smart.tom.messages.SmartMessage](#), and [navigators.smart.service.SimpleServiceData](#).

5.84.2.3 `byte [] eu.tclouds.tubs.util.hash.HashableBase.doGetHash (MessageDigest digest)` [protected]

5.84.2.4 `byte [] eu.tclouds.tubs.util.hash.HashableBase.getHash ()`

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.84.2.5 `byte [] eu.tclouds.tubs.util.hash.HashableBase.getHash (MessageDigest digest)`

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.84.2.6 `boolean eu.tclouds.tubs.util.hash.HashableBase.hasHash ()`

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.84.2.7 `void eu.tclouds.tubs.util.hash.HashableBase.initHash (byte[] hash)` [protected]

5.84.2.8 `boolean eu.tclouds.tubs.util.hash.HashableBase.matchesHashOf (Hashable other)`

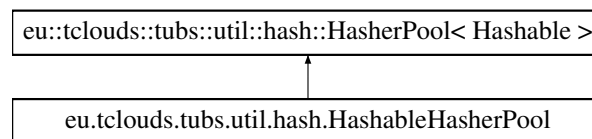
Implements [eu.tclouds.tubs.util.hash.Hashable](#).

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

- [modular-smart/src/eu/tclouds/tubs/util/hash/HashableBase.java](#)

5.85 eu.tclouds.tubs.util.hash.HashableHasherPool Class Reference

Inheritance diagram for eu.tclouds.tubs.util.hash.HashableHasherPool:



Public Member Functions

- [HashableHasherPool](#) (String name, String algorithm, int threadcnt, int queuesize)

5.85.1 Constructor & Destructor Documentation

5.85.1.1 `eu.tclouds.tubs.util.hash.HashableHasherPool.HashableHasherPool (String name, String algorithm, int threadcnt, int queuesize)`

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

- [modular-smart/src/eu/tclouds/tubs/util/hash/HashableHasherPool.java](#)

5.86 eu.tclouds.tubs.util.hash.HasherPool< T > Class Reference

Classes

- interface [Hasher< T >](#)

Public Member Functions

- [HasherPool](#) (String name, String algorithm, int threadcnt, int queuesize, Hasher< T > hasher)
- void [addTask](#) (T task) throws InterruptedException
- void [shutdown](#) ()
- final String [getName](#) ()
- final String [getAlgorithm](#) ()

5.86.1 Constructor & Destructor Documentation

- 5.86.1.1 eu.tclouds.tubs.util.hash.HasherPool< T >.HasherPool (String name, String algorithm, int threadcnt, int queuesize, Hasher< T > hasher)

5.86.2 Member Function Documentation

- 5.86.2.1 void eu.tclouds.tubs.util.hash.HasherPool< T >.addTask (T task) throws InterruptedException
- 5.86.2.2 final String eu.tclouds.tubs.util.hash.HasherPool< T >.getAlgorithm ()
- 5.86.2.3 final String eu.tclouds.tubs.util.hash.HasherPool< T >.getName ()
- 5.86.2.4 void eu.tclouds.tubs.util.hash.HasherPool< T >.shutdown ()

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

- modular-smart/src/eu/tclouds/tubs/util/hash/HasherPool.java

5.87 eu.tclouds.tubs.util.hash.HasherPool< T >.Hasher< T > Interface Reference

Public Member Functions

- void [calcHash](#) (T task, MessageDigest digest)

5.87.1 Member Function Documentation

- 5.87.1.1 void eu.tclouds.tubs.util.hash.HasherPool< T >.Hasher< T >.calcHash (T task, MessageDigest digest)

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

- modular-smart/src/eu/tclouds/tubs/util/hash/HasherPool.java

5.88 eu.tclouds.tubs.util.MeasurementResult Class Reference

Public Member Functions

- void [add](#) (long value)

- void [add](#) ([MeasurementResult](#) value)
- void [reset](#) ()
- boolean [hasData](#) ()
- int [getCount](#) ()
- long [getTotal](#) ()
- long [getMin](#) ()
- long [getMax](#) ()
- Double [getAvg](#) ()

5.88.1 Member Function Documentation

5.88.1.1 void eu.tclouds.tubs.util.MeasurementResult.add (long *value*)

5.88.1.2 void eu.tclouds.tubs.util.MeasurementResult.add ([MeasurementResult](#) *value*)

5.88.1.3 Double eu.tclouds.tubs.util.MeasurementResult.getAvg ()

5.88.1.4 int eu.tclouds.tubs.util.MeasurementResult.getCount ()

5.88.1.5 long eu.tclouds.tubs.util.MeasurementResult.getMax ()

5.88.1.6 long eu.tclouds.tubs.util.MeasurementResult.getMin ()

5.88.1.7 long eu.tclouds.tubs.util.MeasurementResult.getTotal ()

5.88.1.8 boolean eu.tclouds.tubs.util.MeasurementResult.hasData ()

5.88.1.9 void eu.tclouds.tubs.util.MeasurementResult.reset ()

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

- modular-smart/src/eu/tclouds/tubs/util/MeasurementResult.java

5.89 eu.tclouds.tubs.util.PerformanceCounter Class Reference

Public Member Functions

- void [beginBlock](#) ()
- void [endBlock](#) ()
- long [readout](#) ([MeasurementResult](#) pcholder)

5.89.1 Member Function Documentation

5.89.1.1 void eu.tclouds.tubs.util.PerformanceCounter.beginBlock ()

5.89.1.2 void eu.tclouds.tubs.util.PerformanceCounter.endBlock ()

5.89.1.3 long eu.tclouds.tubs.util.PerformanceCounter.readout ([MeasurementResult](#) *pcholder*)

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

- modular-smart/src/eu/tclouds/tubs/util/PerformanceCounter.java

5.90 eu.tclouds.tubs.util.PerformanceLogger Class Reference

Public Member Functions

- [PerformanceLogger](#) ()
- [PerformanceLogger](#) (String name)
- synchronized void [recordBlock](#) (long bt)
- synchronized long [beginBlock](#) (boolean global)
- synchronized void [endBlock](#) ()
- synchronized void [endBlock](#) (long tb)
- synchronized void [startLogger](#) ()
- synchronized void [stopLogger](#) ()
- synchronized void [startRecording](#) ()
- synchronized void [stopRecording](#) ()
- synchronized boolean [isRecording](#) ()
- synchronized void [reset](#) ()
- [MeasurementResult](#) [getTotal](#) ()
- [MeasurementResult](#) [getRecord](#) ()
- synchronized long [getRecordingTimeSpan](#) ()

5.90.1 Constructor & Destructor Documentation

5.90.1.1 eu.tclouds.tubs.util.PerformanceLogger.PerformanceLogger ()

5.90.1.2 eu.tclouds.tubs.util.PerformanceLogger.PerformanceLogger (String name)

5.90.2 Member Function Documentation

5.90.2.1 synchronized long eu.tclouds.tubs.util.PerformanceLogger.beginBlock (boolean global)

5.90.2.2 synchronized void eu.tclouds.tubs.util.PerformanceLogger.endBlock ()

5.90.2.3 synchronized void eu.tclouds.tubs.util.PerformanceLogger.endBlock (long tb)

5.90.2.4 **MeasurementResult** eu.tclouds.tubs.util.PerformanceLogger.getRecord ()

5.90.2.5 synchronized long eu.tclouds.tubs.util.PerformanceLogger.getRecordingTimeSpan ()

5.90.2.6 **MeasurementResult** eu.tclouds.tubs.util.PerformanceLogger.getTotal ()

5.90.2.7 synchronized boolean eu.tclouds.tubs.util.PerformanceLogger.isRecording ()

5.90.2.8 synchronized void eu.tclouds.tubs.util.PerformanceLogger.recordBlock (long bt)

5.90.2.9 synchronized void eu.tclouds.tubs.util.PerformanceLogger.reset ()

5.90.2.10 synchronized void eu.tclouds.tubs.util.PerformanceLogger.startLogger ()

5.90.2.11 synchronized void eu.tclouds.tubs.util.PerformanceLogger.startRecording ()

5.90.2.12 synchronized void eu.tclouds.tubs.util.PerformanceLogger.stopLogger ()

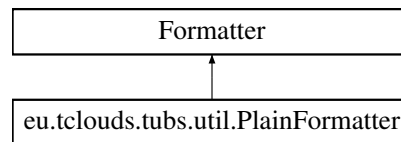
5.90.2.13 synchronized void eu.tclouds.tubs.util.PerformanceLogger.stopRecording ()

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

- modular-smart/src/eu/tclouds/tubs/util/PerformanceLogger.java

5.91 eu.tclouds.tubs.util.PlainFormatter Class Reference

Inheritance diagram for eu.tclouds.tubs.util.PlainFormatter:



Classes

- enum [Fields](#)

Public Member Functions

- [PlainFormatter](#) ()
- [PlainFormatter](#) (String name)
- String [format](#) (java.util.logging.LogRecord record)
- String [getName](#) ()
- boolean [getFieldDisplay](#) ([Fields](#) field)
- void [setFieldDisplay](#) ([Fields](#) field, boolean display)
- String [getDateFormat](#) ()
- void [setDateFormat](#) (String [format](#))

5.91.1 Constructor & Destructor Documentation

5.91.1.1 `eu.tclouds.tubs.util.PlainFormatter.PlainFormatter ()`

5.91.1.2 `eu.tclouds.tubs.util.PlainFormatter.PlainFormatter (String name)`

5.91.2 Member Function Documentation

5.91.2.1 `String eu.tclouds.tubs.util.PlainFormatter.format (java.util.logging.LogRecord record)`

5.91.2.2 `String eu.tclouds.tubs.util.PlainFormatter.getDateFormat ()`

5.91.2.3 `boolean eu.tclouds.tubs.util.PlainFormatter.getFieldDisplay (Fields field)`

5.91.2.4 `String eu.tclouds.tubs.util.PlainFormatter.getName ()`

5.91.2.5 `void eu.tclouds.tubs.util.PlainFormatter.setDateFormat (String format)`

5.91.2.6 `void eu.tclouds.tubs.util.PlainFormatter.setFieldDisplay (Fields field, boolean display)`

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

- modular-smart/src/eu/tclouds/tubs/util/PlainFormatter.java

5.92 eu.tclouds.tubs.util.PlainFormatter.Fields Enum Reference

Public Attributes

- [Level](#)
- [Date](#)
- [Category](#)
- [LoggerName](#)
- [SourceClassName](#)
- [SourceMethodName](#)
- [ThreadName](#)
- [LogDatas](#)
- [Message](#)
- [Thrown](#)

5.92.1 Member Data Documentation

5.92.1.1 [eu.tclouds.tubs.util.PlainFormatter.Fields.Category](#)

5.92.1.2 [eu.tclouds.tubs.util.PlainFormatter.Fields.Date](#)

5.92.1.3 [eu.tclouds.tubs.util.PlainFormatter.Fields.Level](#)

5.92.1.4 [eu.tclouds.tubs.util.PlainFormatter.Fields.LogDatas](#)

5.92.1.5 [eu.tclouds.tubs.util.PlainFormatter.Fields.LoggerName](#)

5.92.1.6 [eu.tclouds.tubs.util.PlainFormatter.Fields.Message](#)

5.92.1.7 [eu.tclouds.tubs.util.PlainFormatter.Fields.SourceClassName](#)

5.92.1.8 [eu.tclouds.tubs.util.PlainFormatter.Fields.SourceMethodName](#)

5.92.1.9 [eu.tclouds.tubs.util.PlainFormatter.Fields.ThreadName](#)

5.92.1.10 [eu.tclouds.tubs.util.PlainFormatter.Fields.Thrown](#)

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

- [modular-smart/src/eu/tclouds/tubs/util/PlainFormatter.java](#)

5.93 eu.tclouds.tubs.util.Profiler Class Reference

Public Member Functions

- [Profiler](#) (String name, int interval)
- long [start](#) ()
- synchronized long [start](#) (boolean global)
- synchronized long [stop](#) ()
- synchronized long [stop](#) (long ts)
- String [getName](#) ()
- synchronized void [reset](#) ()
- synchronized long [getCount](#) ()
- synchronized long [getLastInterval](#) ()

5.93.1 Constructor & Destructor Documentation

5.93.1.1 `eu.tclouds.tubs.util.Profiler.Profiler (String name, int interval)`

5.93.2 Member Function Documentation

5.93.2.1 `synchronized long eu.tclouds.tubs.util.Profiler.getCount ()`

5.93.2.2 `synchronized long eu.tclouds.tubs.util.Profiler.getLastInterval ()`

5.93.2.3 `String eu.tclouds.tubs.util.Profiler.getName ()`

5.93.2.4 `synchronized void eu.tclouds.tubs.util.Profiler.reset ()`

5.93.2.5 `long eu.tclouds.tubs.util.Profiler.start ()`

5.93.2.6 `synchronized long eu.tclouds.tubs.util.Profiler.start (boolean global)`

5.93.2.7 `synchronized long eu.tclouds.tubs.util.Profiler.stop ()`

5.93.2.8 `synchronized long eu.tclouds.tubs.util.Profiler.stop (long ts)`

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

- `modular-smart/src/eu/tclouds/tubs/util/Profiler.java`

5.94 eu.tclouds.tubs.util.StackTrace Class Reference

Public Member Functions

- [StackTrace](#) ()
- [StackTrace](#) (Throwable *t*)
- [StackTrace](#) (StackTraceElement[] *elements*)
- void [print](#) (PrintWriter *writer*, String *prefix*)
- StackTraceElement [findFirstBefore](#) (String *classname*)
- int [findFirstIndexBefore](#) (String *classname*)
- StackTraceElement[] [getElements](#) ()
- String [toString](#) ()
- String [toString](#) (String *prefix*)

Static Public Member Functions

- static StackTraceElement [getPreviousFrame](#) ()

5.94.1 Constructor & Destructor Documentation

5.94.1.1 `eu.tclouds.tubs.util.StackTrace.StackTrace ()`

5.94.1.2 `eu.tclouds.tubs.util.StackTrace.StackTrace (Throwable t)`

5.94.1.3 `eu.tclouds.tubs.util.StackTrace.StackTrace (StackTraceElement[] elements)`

5.94.2 Member Function Documentation

- 5.94.2.1 `StackTraceElement eu.tclouds.tubs.util.StackTrace.findFirstBefore (String classname)`
- 5.94.2.2 `int eu.tclouds.tubs.util.StackTrace.findFirstIndexBefore (String classname)`
- 5.94.2.3 `StackTraceElement [] eu.tclouds.tubs.util.StackTrace.getElements ()`
- 5.94.2.4 `static StackTraceElement eu.tclouds.tubs.util.StackTrace.getPreviousFrame () [static]`
- 5.94.2.5 `void eu.tclouds.tubs.util.StackTrace.print (PrintWriter writer, String prefix)`
- 5.94.2.6 `String eu.tclouds.tubs.util.StackTrace.toString ()`
- 5.94.2.7 `String eu.tclouds.tubs.util.StackTrace.toString (String prefix)`

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

- modular-smart/src/eu/tclouds/tubs/util/StackTrace.java

5.95 navigators.smart.clientsmanagement.ClientData Class Reference

Public Member Functions

- [ClientData](#) (int *clientId*)
- int [getClientId](#) ()
- [PublicKey](#) [getPublicKey](#) ()
- int [getLastMessageExecuted](#) ()
- void [setLastMessageReceived](#) (int *lastMessageReceived*)
- int [getLastMessageReceived](#) ()
- void [setLastMessageReceivedTime](#) (long *lastMessageReceivedTime*)
- long [getLastMessageReceivedTime](#) ()
- void [setLastReplySent](#) ([TOMMessage](#) *lastReplySent*)
- [TOMMessage](#) [getLastReplySent](#) ()
- [TOMMessage](#) [proposeReq](#) ()
- boolean [hasPendingRequests](#) ()
- [TOMMessage](#) [getRequestById](#) (int *reqId*)
- boolean [isProposed](#) ([TOMMessage](#) *request*)
- boolean [addRequest](#) ([TOMMessage](#) *request*)
- boolean [removeRequest](#) ([TOMMessage](#) *request*)
- int [getNumberOfPendingAndProposed](#) ()
- int [getNumberOfPending](#) ()
- boolean [isInPendingList](#) ()
- void [isInPendingList](#) (boolean *value*)

Package Attributes

- ReentrantLock [clientLock](#) = new ReentrantLock()

5.95.1 Constructor & Destructor Documentation

5.95.1.1 navigators.smart.clientsmanagement.ClientData.ClientData (int *clientId*)

Class constructor. Just store the clientId.

Parameters

<i>clientId</i>	
-----------------	--

5.95.2 Member Function Documentation

5.95.2.1 boolean navigators.smart.clientsmanagement.ClientData.addRequest (TOMMessage *request*)

5.95.2.2 int navigators.smart.clientsmanagement.ClientData.getClientId ()

5.95.2.3 int navigators.smart.clientsmanagement.ClientData.getLastMessageExecuted ()

5.95.2.4 int navigators.smart.clientsmanagement.ClientData.getLastMessageReceived ()

5.95.2.5 long navigators.smart.clientsmanagement.ClientData.getLastMessageReceivedTime ()

5.95.2.6 TOMMessage navigators.smart.clientsmanagement.ClientData.getLastReplySent ()

5.95.2.7 int navigators.smart.clientsmanagement.ClientData.getNumberOfPending ()

5.95.2.8 int navigators.smart.clientsmanagement.ClientData.getNumberOfPendingAndProposed ()

5.95.2.9 PublicKey navigators.smart.clientsmanagement.ClientData.getPublicKey ()

5.95.2.10 TOMMessage navigators.smart.clientsmanagement.ClientData.getRequestByld (int *reqId*)

5.95.2.11 boolean navigators.smart.clientsmanagement.ClientData.hasPendingRequests ()

5.95.2.12 boolean navigators.smart.clientsmanagement.ClientData.isInPendingList ()

5.95.2.13 void navigators.smart.clientsmanagement.ClientData.isInPendingList (boolean *value*)

5.95.2.14 boolean navigators.smart.clientsmanagement.ClientData.isProposed (TOMMessage *request*)

5.95.2.15 TOMMessage navigators.smart.clientsmanagement.ClientData.proposeReq ()

5.95.2.16 boolean navigators.smart.clientsmanagement.ClientData.removeRequest (TOMMessage *request*)

5.95.2.17 void navigators.smart.clientsmanagement.ClientData.setLastMessageReceived (int *lastMessageReceived*)

5.95.2.18 void navigators.smart.clientsmanagement.ClientData.setLastMessageReceivedTime (long *lastMessageReceivedTime*)

5.95.2.19 void navigators.smart.clientsmanagement.ClientData.setLastReplySent (TOMMessage *lastReplySent*)

5.95.3 Member Data Documentation

5.95.3.1 ReentrantLock navigators.smart.clientsmanagement.ClientData.clientLock = new ReentrantLock() [package]

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

- modular-smart/src/navigators/smart/clientsmanagement/ClientData.java

5.96 navigators.smart.clientsmanagement.ClientRequestListener Interface Reference

Public Member Functions

- void [requestReceived](#) (Object msg)
- void [requestOrdered](#) (Object msg)

5.96.1 Detailed Description

This interface is used by components that want to be informed upon starting and final descision of client requests.

5.96.2 Member Function Documentation

5.96.2.1 void navigators.smart.clientsmanagement.ClientRequestListener.requestOrdered (Object *msg*)

This method is invoked when the consensus successfully decided upon the message.

5.96.2.2 void navigators.smart.clientsmanagement.ClientRequestListener.requestReceived (Object *msg*)

This method is invoked upon a new message beeing received from a client that shall be ordered/decided by the consensus

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

- modular-smart/src/navigators/smart/clientsmanagement/ClientRequestListener.java

5.97 navigators.smart.clientsmanagement.ClientsManager Class Reference

Public Member Functions

- [ClientsManager](#) (TOMConfiguration conf)
- void [addClientRequestListener](#) (final [ClientRequestListener](#) listener)
- [PendingRequests](#) [getPendingRequests](#) ()
- boolean [hasPendingRequests](#) ()
- void [waitForRequestBatch](#) ()
- boolean [isPending](#) (int reqId)
- [TOMMessage](#) [getPending](#) (int reqId)
- boolean [requestReceived](#) ([TOMMessage](#) request, boolean fromClient)
- boolean [requestReceived](#) ([TOMMessage](#) request, boolean fromClient, boolean storeMessage)
- void [requestOrdered](#) ([TOMMessage](#) request)
- int [getLastSequenceNumber](#) (int clientid)
- ReentrantLock [getClientsLock](#) ()

5.97.1 Constructor & Destructor Documentation

5.97.1.1 navigators.smart.clientsmanagement.ClientsManager.ClientsManager (TOMConfiguration *conf*)

5.97.2 Member Function Documentation

5.97.2.1 void navigators.smart.clientsmanagement.ClientsManager.addClientRequestListener (final **ClientRequestListener** *listener*)

Retisters a

See Also

[ClientRequestListener](#) at this manager

Parameters

<i>listener</i>	The listener to be registered
-----------------	-------------------------------

5.97.2.2 ReentrantLock navigators.smart.clientsmanagement.ClientsManager.getClientsLock ()

5.97.2.3 int navigators.smart.clientsmanagement.ClientsManager.getLastSequenceNumber (int *clientid*)

5.97.2.4 **TOMMessage** navigators.smart.clientsmanagement.ClientsManager.getPending (int *reqId*)

Get some reqId that is pending.

Parameters

<i>reqId</i>	the request identifier
--------------	------------------------

Returns

the pending request, or null

5.97.2.5 **PendingRequests** navigators.smart.clientsmanagement.ClientsManager.getPendingRequests ()

Get pending requests in a fair way (one request from each client queue until the max number of requests is gotten).

Returns

the set of all pending requests of this system

5.97.2.6 boolean navigators.smart.clientsmanagement.ClientsManager.hasPendingRequests ()

We've implemented some protection for individual client data, but the clients table can change during the operation.

Returns

true if there are some pending requests and false otherwise

5.97.2.7 boolean navigators.smart.clientsmanagement.ClientsManager.isPending (int *reqId*)

Verifies if some reqId is pending.

Parameters

<i>reqId</i>	the request identifier
--------------	------------------------

Returns

true if the request is pending

5.97.2.8 void navigators.smart.clientsmanagement.ClientsManager.requestOrdered (TOMMessage request)

Notifies the [ClientsManager](#) that the request was executed. It cleans all state for this request (e.g., removes it from the pending requests queue and stop any timer for it).

Parameters

<i>request</i>	the request executed by the application
<i>reply</i>	the resulting reply of the request execution

5.97.2.9 boolean navigators.smart.clientsmanagement.ClientsManager.requestReceived (TOMMessage request, boolean fromClient)

5.97.2.10 boolean navigators.smart.clientsmanagement.ClientsManager.requestReceived (TOMMessage request, boolean fromClient, boolean storeMessage)

Notifies the [ClientsManager](#) that a new request from a client arrived. This method updates the [ClientData](#) of the client request.getSender().

Parameters

<i>request</i>	the received request
<i>fromClient</i>	the message was received from client or not?
<i>storeMessage</i>	the message should be stored or not? (read-only requests are not stored)

Returns

true if the request is ok and is added to the pending messages for this client, false if there is some problem and the message was not accounted

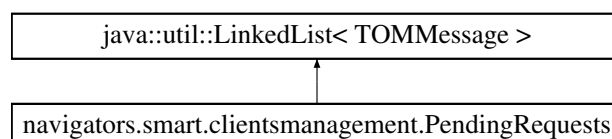
5.97.2.11 void navigators.smart.clientsmanagement.ClientsManager.waitForRequestBatch ()

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

- modular-smart/src/navigators/smart/clientsmanagement/ClientsManager.java

5.98 navigators.smart.clientsmanagement.PendingRequests Class Reference

Inheritance diagram for navigators.smart.clientsmanagement.PendingRequests:



Public Member Functions

- [PendingRequests](#) ()

- [TOMMessage removeById](#) (int id)
- [int\[\] getIds](#) ()
- [TOMMessage getById](#) (int id)
- [boolean contains](#) (int id)

5.98.1 Detailed Description

Extended LinkedList used to store pending requests issued by a client.

5.98.2 Constructor & Destructor Documentation

5.98.2.1 `navigators.smart.clientsmanagement.PendingRequests.PendingRequests ()`

5.98.3 Member Function Documentation

5.98.3.1 `boolean navigators.smart.clientsmanagement.PendingRequests.contains (int id)`

5.98.3.2 `TOMMessage navigators.smart.clientsmanagement.PendingRequests.getById (int id)`

5.98.3.3 `int [] navigators.smart.clientsmanagement.PendingRequests.getIds ()`

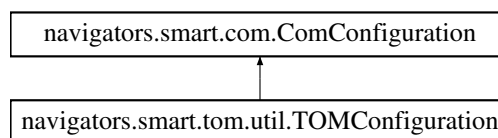
5.98.3.4 `TOMMessage navigators.smart.clientsmanagement.PendingRequests.removeById (int id)`

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

- modular-smart/src/navigators/smart/clientsmanagement/PendingRequests.java

5.99 navigators.smart.com.ComConfiguration Interface Reference

Inheritance diagram for `navigators.smart.com.ComConfiguration`:



Public Member Functions

- [int getProcessID](#) ()
- [int getNumberOfServers](#) ()
- [String getServerHost](#) (int procid)
- [int getClientComPort](#) (int procid)
- [int getServerComPort](#) (int procid)
- [int getOutQueueSize](#) ()
- [boolean useSenderThread](#) ()

5.99.1 Member Function Documentation

5.99.1.1 `int navigators.smart.com.ComConfiguration.getClientComPort (int procid)`

5.99.1.2 `int navigators.smart.com.ComConfiguration.getNumberOfServers ()`

Implemented in [navigators.smart.tom.util.TOMConfiguration](#).

5.99.1.3 `int navigators.smart.com.ComConfiguration.getOutQueueSize ()`

Implemented in [navigators.smart.tom.util.TOMConfiguration](#).

5.99.1.4 `int navigators.smart.com.ComConfiguration.getProcessID ()`

5.99.1.5 `int navigators.smart.com.ComConfiguration.getServerComPort (int procid)`

Implemented in [navigators.smart.tom.util.TOMConfiguration](#).

5.99.1.6 `String navigators.smart.com.ComConfiguration.getServerHost (int procid)`

5.99.1.7 `boolean navigators.smart.com.ComConfiguration.useSenderThread ()`

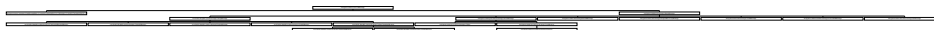
Implemented in [navigators.smart.tom.util.TOMConfiguration](#).

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

- modular-smart/src/navigators/smart/com/ComConfiguration.java

5.100 navigators.smart.com.ComMessage Interface Reference

Inheritance diagram for navigators.smart.com.ComMessage:



Public Member Functions

- byte [getTypeID](#) ()
- int [getSenderID](#) ()
- int [getBodySize](#) ()
- void [writeBodyTo](#) (ByteBuffer out)

5.100.1 Member Function Documentation

5.100.1.1 `int navigators.smart.com.ComMessage.getBodySize ()`

Implemented in [navigators.smart.tom.messages.SmartMessage](#).

5.100.1.2 `int navigators.smart.com.ComMessage.getSenderID ()`

Implemented in [navigators.smart.tom.messages.SmartMessage](#).

5.100.1.3 `byte navigators.smart.com.ComMessage.getTypeID ()`

Implemented in [navigators.smart.tom.messages.SmartMessage](#).

5.100.1.4 `void navigators.smart.com.ComMessage.writeBodyTo (ByteBuffer out)`

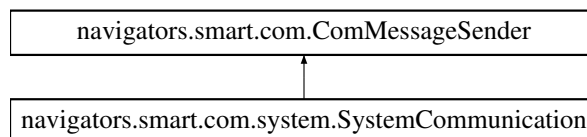
Implemented in [navigators.smart.tom.messages.SmartMessage](#), and [eu.tclouds.cheapbft.system.messages.-CheapMessage](#).

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

- `modular-smart/src/navigators/smart/com/ComMessage.java`

5.101 `navigators.smart.com.ComMessageSender` Interface Reference

Inheritance diagram for `navigators.smart.com.ComMessageSender`:



Public Member Functions

- `void send (int remotid, ComMessage msg)`

5.101.1 Member Function Documentation

5.101.1.1 `void navigators.smart.com.ComMessageSender.send (int remotid, ComMessage msg)`

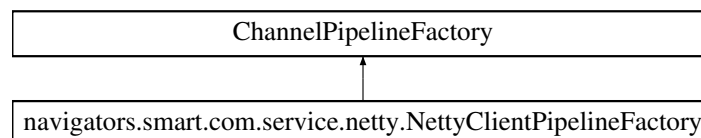
Implemented in [navigators.smart.com.system.SystemCommunication](#).

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

- `modular-smart/src/navigators/smart/com/ComMessageSender.java`

5.102 `navigators.smart.com.service.netty.NettyClientPipelineFactory` Class Reference

Inheritance diagram for `navigators.smart.com.service.netty.NettyClientPipelineFactory`:



Public Member Functions

- `NettyClientPipelineFactory (NettyServiceCommunicationClient ncs, boolean isClient, Hashtable< Integer, NettyClientServerSession > sessionTable, SecretKey authKey, int macLength, TOMConfiguration conf, ReentrantReadWriteLock rl, int signatureLength, ReentrantLock lock)`

- ChannelPipeline [getPipeline](#) () throws Exception

Package Attributes

- [NettyServiceCommunicationClient](#) *ncs*
- boolean [isClient](#)
- Hashtable< Integer, [NettyClientServerSession](#) > [sessionTable](#)
- SecretKey [authKey](#)
- int [macLength](#)
- int [signatureLength](#)
- [TOMConfiguration](#) *conf*
- ReentrantReadWriteLock *rl*
- ReentrantLock [lock](#)

5.102.1 Constructor & Destructor Documentation

- 5.102.1.1 `navigators.smart.com.service.netty.NettyClientPipelineFactory.NettyClientPipelineFactory (NettyServiceCommunicationClient ncs, boolean isClient, Hashtable< Integer, NettyClientServerSession > sessionTable, SecretKey authKey, int macLength, TOMConfiguration conf, ReentrantReadWriteLock rl, int signatureLength, ReentrantLock lock)`

5.102.2 Member Function Documentation

- 5.102.2.1 ChannelPipeline `navigators.smart.com.service.netty.NettyClientPipelineFactory.getPipeline ()` throws Exception

5.102.3 Member Data Documentation

- 5.102.3.1 SecretKey `navigators.smart.com.service.netty.NettyClientPipelineFactory.authKey` [package]
- 5.102.3.2 [TOMConfiguration](#) `navigators.smart.com.service.netty.NettyClientPipelineFactory.conf` [package]
- 5.102.3.3 boolean `navigators.smart.com.service.netty.NettyClientPipelineFactory.isClient` [package]
- 5.102.3.4 ReentrantLock `navigators.smart.com.service.netty.NettyClientPipelineFactory.lock` [package]
- 5.102.3.5 int `navigators.smart.com.service.netty.NettyClientPipelineFactory.macLength` [package]
- 5.102.3.6 [NettyServiceCommunicationClient](#) `navigators.smart.com.service.netty.NettyClientPipelineFactory.ncs` [package]
- 5.102.3.7 ReentrantReadWriteLock `navigators.smart.com.service.netty.NettyClientPipelineFactory.rl` [package]
- 5.102.3.8 Hashtable<Integer,[NettyClientServerSession](#)> `navigators.smart.com.service.netty.NettyClientPipelineFactory-sessionTable` [package]
- 5.102.3.9 int `navigators.smart.com.service.netty.NettyClientPipelineFactory.signatureLength` [package]

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

- modular-smart/src/navigators/smart/com/service/netty/NettyClientPipelineFactory.java

5.103 navigators.smart.com.service.netty.NettyClientServerSession Class Reference

Public Member Functions

- [NettyClientServerSession](#) (Channel channel, Mac macSend, Mac macReceive, int replicald, PublicKey pKey, Lock lock)
- Mac [getMacReceive](#) ()
- Mac [getMacSend](#) ()
- Channel [getChannel](#) ()
- int [getReplicald](#) ()
- PublicKey [getPublicKey](#) ()
- Lock [getLock](#) ()
- int [getLastMsgReceived](#) ()
- void [setLastMsgReceived](#) (int lastMsgReceived_)

5.103.1 Constructor & Destructor Documentation

- 5.103.1.1 `navigators.smart.com.service.netty.NettyClientServerSession.NettyClientServerSession (Channel channel, Mac macSend, Mac macReceive, int replicald, PublicKey pKey, Lock lock)`

5.103.2 Member Function Documentation

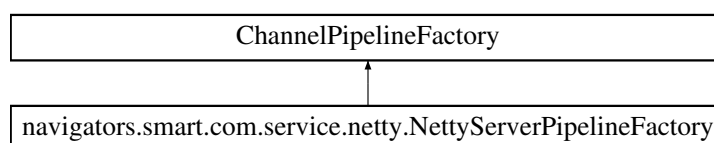
- 5.103.2.1 Channel `navigators.smart.com.service.netty.NettyClientServerSession.getChannel ()`
- 5.103.2.2 int `navigators.smart.com.service.netty.NettyClientServerSession.getLastMsgReceived ()`
- 5.103.2.3 Lock `navigators.smart.com.service.netty.NettyClientServerSession.getLock ()`
- 5.103.2.4 Mac `navigators.smart.com.service.netty.NettyClientServerSession.getMacReceive ()`
- 5.103.2.5 Mac `navigators.smart.com.service.netty.NettyClientServerSession.getMacSend ()`
- 5.103.2.6 PublicKey `navigators.smart.com.service.netty.NettyClientServerSession.getPublicKey ()`
- 5.103.2.7 int `navigators.smart.com.service.netty.NettyClientServerSession.getReplicald ()`
- 5.103.2.8 void `navigators.smart.com.service.netty.NettyClientServerSession.setLastMsgReceived (int lastMsgReceived_)`

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

- modular-smart/src/navigators/smart/com/service/netty/NettyClientServerSession.java

5.104 navigators.smart.com.service.netty.NettyServerPipelineFactory Class Reference

Inheritance diagram for `navigators.smart.com.service.netty.NettyServerPipelineFactory`:



Public Member Functions

- [NettyServerPipelineFactory](#) ([NettyServiceCommuncationServer](#) *ncs*, boolean *isClient*, [Hashtable](#)< [Integer](#), [NettyClientServerSession](#) > *sessionTable*, [SecretKey](#) *authKey*, int *macLength*, [TOMConfiguration](#) *conf*, [ReentrantReadWriteLock](#) *rl*, int *signatureLength*, [ReentrantLock](#) *lock*)
- [ChannelPipeline](#) [getPipeline](#) () throws [Exception](#)

Package Attributes

- [NettyServiceCommuncationServer](#) *ncs*
- boolean *isClient*
- [Hashtable](#)< [Integer](#), [NettyClientServerSession](#) > *sessionTable*
- [SecretKey](#) *authKey*
- int *macLength*
- int *signatureLength*
- [TOMConfiguration](#) *conf*
- [ReentrantReadWriteLock](#) *rl*
- [ReentrantLock](#) *lock*

5.104.1 Constructor & Destructor Documentation

- 5.104.1.1 [navigators.smart.com.service.netty.NettyServerPipelineFactory.NettyServerPipelineFactory](#) ([NettyServiceCommuncationServer](#) *ncs*, boolean *isClient*, [Hashtable](#)< [Integer](#), [NettyClientServerSession](#) > *sessionTable*, [SecretKey](#) *authKey*, int *macLength*, [TOMConfiguration](#) *conf*, [ReentrantReadWriteLock](#) *rl*, int *signatureLength*, [ReentrantLock](#) *lock*)

5.104.2 Member Function Documentation

- 5.104.2.1 [ChannelPipeline](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.getPipeline](#) () throws [Exception](#)

5.104.3 Member Data Documentation

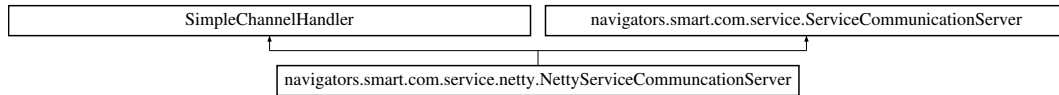
- 5.104.3.1 [SecretKey](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.authKey](#) [package]
- 5.104.3.2 [TOMConfiguration](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.conf](#) [package]
- 5.104.3.3 boolean [navigators.smart.com.service.netty.NettyServerPipelineFactory.isClient](#) [package]
- 5.104.3.4 [ReentrantLock](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.lock](#) [package]
- 5.104.3.5 int [navigators.smart.com.service.netty.NettyServerPipelineFactory.macLength](#) [package]
- 5.104.3.6 [NettyServiceCommuncationServer](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.ncs](#) [package]
- 5.104.3.7 [ReentrantReadWriteLock](#) [navigators.smart.com.service.netty.NettyServerPipelineFactory.rl](#) [package]
- 5.104.3.8 [Hashtable](#)<[Integer](#),[NettyClientServerSession](#)> [navigators.smart.com.service.netty.NettyServerPipelineFactory.sessionTable](#) [package]
- 5.104.3.9 int [navigators.smart.com.service.netty.NettyServerPipelineFactory.signatureLength](#) [package]

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

- [modular-smart/src/navigators/smart/com/service/netty/NettyServerPipelineFactory.java](#)

5.105 navigators.smart.com.service.netty.NettyServiceCommuncationServer Class Reference

Inheritance diagram for navigators.smart.com.service.netty.NettyServiceCommuncationServer:



Public Member Functions

- [NettyServiceCommuncationServer](#) ([TOMConfiguration](#) conf, [RequestReceiver](#) receiver) throws Configuration-Exception
- void [exceptionCaught](#) (ChannelHandlerContext ctx, ExceptionEvent e)
- void [messageReceived](#) (ChannelHandlerContext ctx, MessageEvent e)
- void [channelConnected](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- void [channelClosed](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- void [send](#) (int remoteid, [TOMMessage](#) sm)

5.105.1 Constructor & Destructor Documentation

- 5.105.1.1 [navigators.smart.com.service.netty.NettyServiceCommuncationServer.NettyServiceCommuncationServer](#) ([TOMConfiguration](#) conf, [RequestReceiver](#) receiver) throws [ConfigurationException](#)

5.105.2 Member Function Documentation

- 5.105.2.1 void [navigators.smart.com.service.netty.NettyServiceCommuncationServer.channelClosed](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- 5.105.2.2 void [navigators.smart.com.service.netty.NettyServiceCommuncationServer.channelConnected](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- 5.105.2.3 void [navigators.smart.com.service.netty.NettyServiceCommuncationServer.exceptionCaught](#) (ChannelHandlerContext ctx, ExceptionEvent e)
- 5.105.2.4 void [navigators.smart.com.service.netty.NettyServiceCommuncationServer.messageReceived](#) (ChannelHandlerContext ctx, MessageEvent e)
- 5.105.2.5 void [navigators.smart.com.service.netty.NettyServiceCommuncationServer.send](#) (int remoteid, [TOMMessage](#) sm)

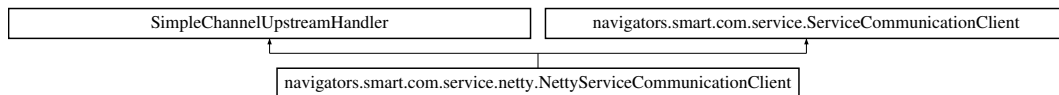
Implements [navigators.smart.com.service.ServiceCommunicationServer](#).

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

- modular-smart/src/navigators/smart/com/service/netty/NettyServiceCommuncationServer.java

5.106 navigators.smart.com.service.netty.NettyServiceCommunicationClient Class Reference

Inheritance diagram for navigators.smart.com.service.netty.NettyServiceCommunicationClient:



Public Member Functions

- [NettyServiceCommunicationClient](#) ([TOMConfiguration](#) conf, [ReplyReceiver](#) receiver)
- void [start](#) ()
- void [exceptionCaught](#) (ChannelHandlerContext ctx, ExceptionEvent e)
- void [messageReceived](#) (ChannelHandlerContext ctx, MessageEvent e)
- void [channelConnected](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- void [channelClosed](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- void [send](#) (boolean [sign](#), int[] targets, [TOMMessage](#) sm)
- void [send](#) (boolean [sign](#), int target, [TOMMessage](#) sm)
- void [sign](#) ([TOMMessage](#) sm)
- byte[] [signMessage](#) (PrivateKey key, [TOMMessage](#) message)

Protected Attributes

- [ReplyReceiver](#) trr

5.106.1 Constructor & Destructor Documentation

- 5.106.1.1 [navigators.smart.com.service.netty.NettyServiceCommunicationClient.NettyServiceCommunicationClient](#) ([TOMConfiguration](#) conf, [ReplyReceiver](#) receiver)

5.106.2 Member Function Documentation

- 5.106.2.1 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.channelClosed](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- 5.106.2.2 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.channelConnected](#) (ChannelHandlerContext ctx, ChannelStateEvent e)
- 5.106.2.3 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.exceptionCaught](#) (ChannelHandlerContext ctx, ExceptionEvent e)
- 5.106.2.4 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.messageReceived](#) (ChannelHandlerContext ctx, MessageEvent e)
- 5.106.2.5 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.send](#) (boolean [sign](#), int[] targets, [TOMMessage](#) sm)

Implements [navigators.smart.com.service.ServiceCommunicationClient](#).

- 5.106.2.6 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.send](#) (boolean [sign](#), int target, [TOMMessage](#) sm)

Implements [navigators.smart.com.service.ServiceCommunicationClient](#).

- 5.106.2.7 void [navigators.smart.com.service.netty.NettyServiceCommunicationClient.sign](#) ([TOMMessage](#) sm)

Implements [navigators.smart.com.service.ServiceCommunicationClient](#).

5.106.2.8 `byte [] navigators.smart.com.service.netty.NettyServiceCommunicationClient.signMessage (PrivateKey key, TOMMessage message)`

5.106.2.9 `void navigators.smart.com.service.netty.NettyServiceCommunicationClient.start ()`

Implements [navigators.smart.com.service.ServiceCommunicationClient](#).

5.106.3 Member Data Documentation

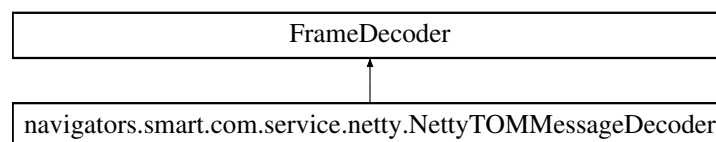
5.106.3.1 **ReplyReceiver** `navigators.smart.com.service.netty.NettyServiceCommunicationClient.trr` `[protected]`

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

- modular-smart/src/navigators/smart/com/service/netty/NettyServiceCommunicationClient.java

5.107 navigators.smart.com.service.netty.NettyTOMMessageDecoder Class Reference

Inheritance diagram for `navigators.smart.com.service.netty.NettyTOMMessageDecoder`:



Public Member Functions

- [NettyTOMMessageDecoder](#) (boolean isClient, Hashtable< Integer, [NettyClientServerSession](#) > sessionTable, SecretKey authKey, int macLength, [Configuration](#) conf, ReentrantReadWriteLock rl, int signatureLength, boolean useMAC)
- void [initConnection](#) (int sender, Channel channel)
- boolean [verifySignatureAux](#) (PublicKey key, byte[] message, byte[] signature)

Protected Member Functions

- Object [decode](#) (ChannelHandlerContext ctx, Channel channel, ChannelBuffer buffer)

Package Functions

- boolean [verifyMAC](#) (int id, byte[] data, byte[] digest)
- boolean [verifySignature](#) (int id, byte[] data, byte[] digest)

5.107.1 Constructor & Destructor Documentation

5.107.1.1 `navigators.smart.com.service.netty.NettyTOMMessageDecoder.NettyTOMMessageDecoder (boolean isClient, Hashtable< Integer, NettyClientServerSession > sessionTable, SecretKey authKey, int macLength, Configuration conf, ReentrantReadWriteLock rl, int signatureLength, boolean useMAC)`

5.107.2 Member Function Documentation

- 5.107.2.1 Object `navigators.smart.com.service.netty.NettyTOMMessageDecoder.decode (ChannelHandlerContext ctx, Channel channel, ChannelBuffer buffer)` [protected]
- 5.107.2.2 void `navigators.smart.com.service.netty.NettyTOMMessageDecoder.initConnection (int sender, Channel channel)`
- 5.107.2.3 boolean `navigators.smart.com.service.netty.NettyTOMMessageDecoder.verifyMAC (int id, byte[] data, byte[] digest)` [package]
- 5.107.2.4 boolean `navigators.smart.com.service.netty.NettyTOMMessageDecoder.verifySignature (int id, byte[] data, byte[] digest)` [package]
- 5.107.2.5 boolean `navigators.smart.com.service.netty.NettyTOMMessageDecoder.verifySignatureAux (PublicKey key, byte[] message, byte[] signature)`

Verify the signature of a message.

Parameters

<i>key</i>	the public key to be used to verify the signature
<i>message</i>	the signed message
<i>signature</i>	the signature to be verified

Returns

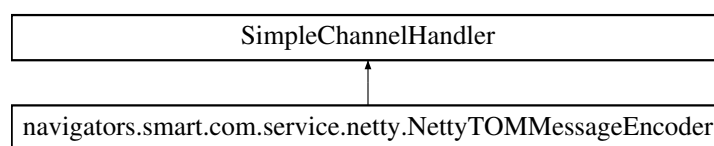
the signature

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

- modular-smart/src/navigators/smart/com/service/netty/NettyTOMMessageDecoder.java

5.108 navigators.smart.com.service.netty.NettyTOMMessageEncoder Class Reference

Inheritance diagram for `navigators.smart.com.service.netty.NettyTOMMessageEncoder`:



Public Member Functions

- [NettyTOMMessageEncoder](#) (Hashtable< Integer, [NettyClientServerSession](#) > sessionTable, ReentrantReadWriteLock rl, int signatureLength, boolean useMAC)
- void [writeRequested](#) (ChannelHandlerContext ctx, MessageEvent e) throws Exception

Package Functions

- byte[] [produceMAC](#) (int id, byte[] data)

5.108.1 Constructor & Destructor Documentation

5.108.1.1 `navigators.smart.com.service.netty.NettyTOMMessageEncoder.NettyTOMMessageEncoder (Hashtable< Integer, NettyClientServerSession > sessionTable, ReentrantReadWriteLock rl, int signatureLength, boolean useMAC)`

5.108.2 Member Function Documentation

5.108.2.1 `byte [] navigators.smart.com.service.netty.NettyTOMMessageEncoder.produceMAC (int id, byte[] data) [package]`

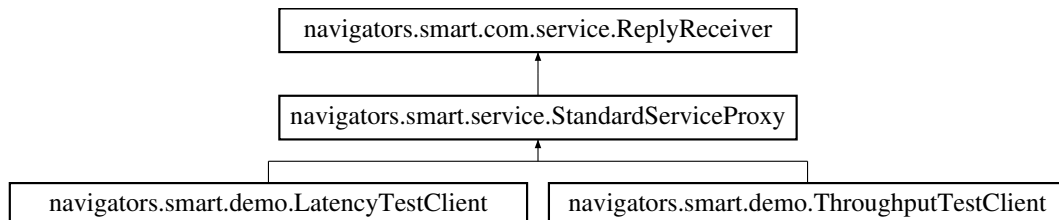
5.108.2.2 `void navigators.smart.com.service.netty.NettyTOMMessageEncoder.writeRequested (ChannelHandlerContext ctx, MessageEvent e) throws Exception`

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

- `modular-smart/src/navigators/smart/com/service/netty/NettyTOMMessageEncoder.java`

5.109 navigators.smart.com.service.ReplyReceiver Interface Reference

Inheritance diagram for `navigators.smart.com.service.ReplyReceiver`:



Public Member Functions

- `void receivedReply (TOMMessage reply)`

5.109.1 Detailed Description

Interface meant for objects that receive replies from replicas

5.109.2 Member Function Documentation

5.109.2.1 `void navigators.smart.com.service.ReplyReceiver.receivedReply (TOMMessage reply)`

This is the method invoked by the client side communication system, and where the code to handle the reply is to be written

Parameters

<i>reply</i>	The reply delivered by the client side communication system
--------------	---

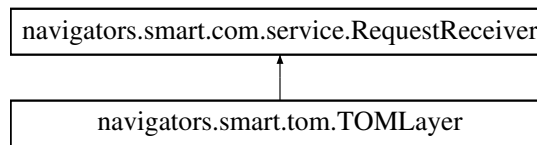
Implemented in `navigators.smart.service.StandardServiceProxy`, `navigators.smart.demo.ThroughputTestClient`, and `navigators.smart.demo.LatencyTestClient`.

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

- `modular-smart/src/navigators/smart/com/service/ReplyReceiver.java`

5.110 navigators.smart.com.service.RequestReceiver Interface Reference

Inheritance diagram for navigators.smart.com.service.RequestReceiver:



Public Member Functions

- void [receivedRequest](#) ([TOMMessage](#) msg) throws InterruptedException

5.110.1 Detailed Description

Interface meant for objects that receive requests from clients

5.110.2 Member Function Documentation

5.110.2.1 void `navigators.smart.com.service.RequestReceiver.receivedRequest (TOMMessage msg)` throws InterruptedException

This is the method invoked by the `CommunicationSystemServerSide`, to deliver a client request. The code to handle requests should be put here.

Parameters

<i>msg</i>	The request delivered by the TOM layer
------------	--

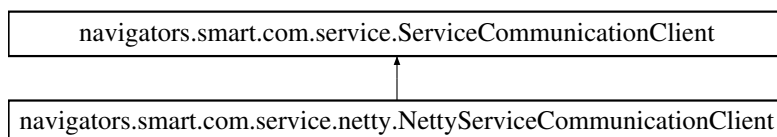
Implemented in [navigators.smart.tom.TOMLayer](#).

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

- modular-smart/src/navigators/smart/com/service/RequestReceiver.java

5.111 navigators.smart.com.service.ServiceCommunicationClient Interface Reference

Inheritance diagram for navigators.smart.com.service.ServiceCommunicationClient:



Public Member Functions

- void [start](#) ()
- void [send](#) (boolean [sign](#), int[] targets, [TOMMessage](#) sm)
- void [send](#) (boolean [sign](#), int target, [TOMMessage](#) sm)
- void [sign](#) ([TOMMessage](#) sm)

5.111.1 Detailed Description

Methods that should be implemented by the client side of the client-server communication system

5.111.2 Member Function Documentation

5.111.2.1 `void navigators.smart.com.service.ServiceCommunicationClient.send (boolean sign, int[] targets, TOMMessage sm)`

Implemented in [navigators.smart.com.service.netty.NettyServiceCommunicationClient](#).

5.111.2.2 `void navigators.smart.com.service.ServiceCommunicationClient.send (boolean sign, int target, TOMMessage sm)`

Implemented in [navigators.smart.com.service.netty.NettyServiceCommunicationClient](#).

5.111.2.3 `void navigators.smart.com.service.ServiceCommunicationClient.sign (TOMMessage sm)`

Implemented in [navigators.smart.com.service.netty.NettyServiceCommunicationClient](#).

5.111.2.4 `void navigators.smart.com.service.ServiceCommunicationClient.start ()`

Implemented in [navigators.smart.com.service.netty.NettyServiceCommunicationClient](#).

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

- modular-smart/src/navigators/smart/com/service/ServiceCommunicationClient.java

5.112 navigators.smart.com.service.ServiceCommunicationClientFactory Class Reference

Static Public Member Functions

- static [ServiceCommunicationClient](#) `getCommunicationSystemClientSide (TOMConfiguration conf, ReplyReceiver receiver)`

5.112.1 Member Function Documentation

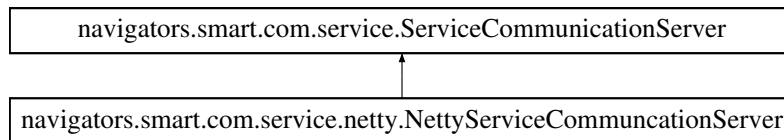
5.112.1.1 `static ServiceCommunicationClient navigators.smart.com.service.ServiceCommunicationClientFactory.getCommunicationSystemClientSide (TOMConfiguration conf, ReplyReceiver receiver)`
[static]

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

- modular-smart/src/navigators/smart/com/service/ServiceCommunicationClientFactory.java

5.113 navigators.smart.com.service.ServiceCommunicationServer Interface Reference

Inheritance diagram for navigators.smart.com.service.ServiceCommunicationServer:



Public Member Functions

- void [send](#) (int remoteid, [TOMMessage](#) sm)

5.113.1 Detailed Description

Methods that should be implemented by the server side of the client-server communication system

5.113.2 Member Function Documentation

5.113.2.1 void [navigators.smart.com.service.ServiceCommunicationServer.send](#) (int *remoteid*, [TOMMessage](#) *sm*)

Implemented in [navigators.smart.com.service.netty.NettyServiceCommunicationServer](#).

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

- modular-smart/src/navigators/smart/com/service/ServiceCommunicationServer.java

5.114 navigators.smart.com.service.ServiceCommunicationServerFactory Class Reference

Static Public Member Functions

- static [ServiceCommunicationServer](#) [createServiceCommunicationServer](#) ([TOMConfiguration](#) conf, [RequestReceiver](#) receiver) throws [ConfigurationException](#)

5.114.1 Member Function Documentation

5.114.1.1 static [ServiceCommunicationServer](#) [navigators.smart.com.service.ServiceCommunicationServerFactory.createServiceCommunicationServer](#) ([TOMConfiguration](#) *conf*, [RequestReceiver](#) *receiver*) throws [ConfigurationException](#) [static]

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

- modular-smart/src/navigators/smart/com/service/ServiceCommunicationServerFactory.java

5.115 navigators.smart.com.system.ServerConnection Class Reference

Classes

- class [ReceiverThread](#)

Public Member Functions

- [ServerConnection](#) ([ComConfiguration](#) conf, [SocketChannel](#) socket, int remoteld, [SystemMessageReceiver](#) receiver)
- void [shutdown](#) ()
- final void [send](#) ([ComMessage](#) msg) throws [InterruptedException](#)

Protected Member Functions

- void [reconnect](#) ([SocketChannel](#) newSocket)

Protected Attributes

- [BlockingQueue](#)< [ComMessage](#) > [outQueue](#)

5.115.1 Detailed Description

This class represents a connection with other server.

ServerConnections are created by [ServerCommunicationLayer](#).

5.115.2 Constructor & Destructor Documentation

5.115.2.1 `navigators.smart.com.system.ServerConnection.ServerConnection (ComConfiguration conf, SocketChannel socket, int remoteld, SystemMessageReceiver receiver)`

5.115.3 Member Function Documentation

5.115.3.1 `void navigators.smart.com.system.ServerConnection.reconnect (SocketChannel newSocket)` [protected]

(Re-)establish connection between peers.

Parameters

<i>newSocket</i>	socket created when this server accepted the connection (only used if processId is less than remoteld)
------------------	--

5.115.3.2 `final void navigators.smart.com.system.ServerConnection.send (ComMessage msg)` throws [InterruptedException](#)

Used to send packets to the remote server.

Parameters

<i>data</i>	The data to send
-------------	------------------

Exceptions

<i>InterruptedException</i>	
---	--

5.115.3.3 `void navigators.smart.com.system.ServerConnection.shutdown ()`

Stop message sending and reception.

5.115.4 Member Data Documentation

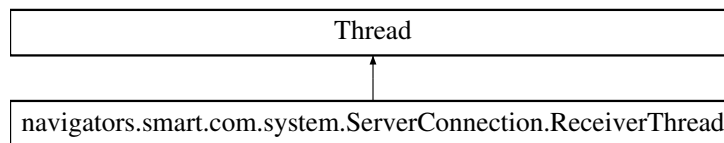
5.115.4.1 `BlockingQueue<ComMessage> navigators.smart.com.system.ServerConnection.outQueue` [protected]

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

- modular-smart/src/navigators/smart/com/system/ServerConnection.java

5.116 navigators.smart.com.system.ServerConnection.ReceiverThread Class Reference

Inheritance diagram for `navigators.smart.com.system.ServerConnection.ReceiverThread`:



Public Member Functions

- [ReceiverThread](#) ()
- void [run](#) ()

5.116.1 Detailed Description

Thread used to receive packets from the remote server.

5.116.2 Constructor & Destructor Documentation

5.116.2.1 `navigators.smart.com.system.ServerConnection.ReceiverThread.ReceiverThread ()`

5.116.3 Member Function Documentation

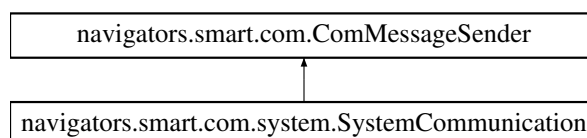
5.116.3.1 `void navigators.smart.com.system.ServerConnection.ReceiverThread.run ()`

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

- modular-smart/src/navigators/smart/com/system/ServerConnection.java

5.117 navigators.smart.com.system.SystemCommunication Class Reference

Inheritance diagram for `navigators.smart.com.system.SystemCommunication`:



Public Member Functions

- [SystemCommunication](#) ([ComConfiguration](#) conf, [SystemMessageReceiverFactory](#) receiverfac) throws [ConfigurationException](#)
- synchronized void [start](#) () throws [IOException](#)
- final void [send](#) (int remoteid, [ComMessage](#) msg)
- void [shutdown](#) ()

Static Package Functions

- static void [setSocketOptions](#) ([Socket](#) socket)

5.117.1 Constructor & Destructor Documentation

5.117.1.1 [navigators.smart.com.system.SystemCommunication.SystemCommunication](#) ([ComConfiguration](#) conf, [SystemMessageReceiverFactory](#) receiverfac) throws [ConfigurationException](#)

5.117.2 Member Function Documentation

5.117.2.1 final void [navigators.smart.com.system.SystemCommunication.send](#) (int remoteid, [ComMessage](#) msg)

Implements [navigators.smart.com.ComMessageSender](#).

5.117.2.2 static void [navigators.smart.com.system.SystemCommunication.setSocketOptions](#) ([Socket](#) socket) [static], [package]

5.117.2.3 void [navigators.smart.com.system.SystemCommunication.shutdown](#) ()

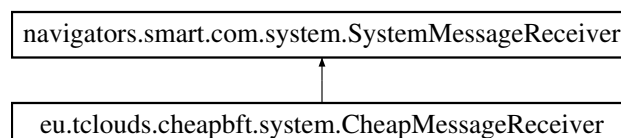
5.117.2.4 synchronized void [navigators.smart.com.system.SystemCommunication.start](#) () throws [IOException](#)

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

- modular-smart/src/navigators/smart/com/system/SystemCommunication.java

5.118 navigators.smart.com.system.SystemMessageReceiver Interface Reference

Inheritance diagram for [navigators.smart.com.system.SystemMessageReceiver](#):



Public Member Functions

- void [receivedSystemMessage](#) (byte typeid, int senderid, [ByteBuffer](#) msgbuf)

5.118.1 Member Function Documentation

5.118.1.1 `void navigators.smart.com.system.SystemMessageReceiver.receivedSystemMessage (byte typeid, int senderid, ByteBuffer msgbuf)`

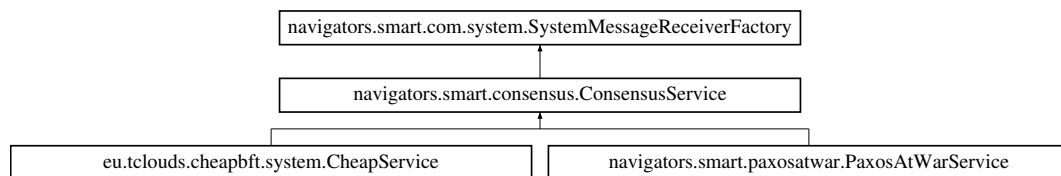
Implemented in [eu.tclouds.cheapbft.system.CheapMessageReceiver](#).

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

- modular-smart/src/navigators/smart/com/system/SystemMessageReceiver.java

5.119 navigators.smart.com.system.SystemMessageReceiverFactory Interface Reference

Inheritance diagram for `navigators.smart.com.system.SystemMessageReceiverFactory`:



Public Member Functions

- [SystemMessageReceiver](#) `createServerMessageReceiver (int remoteid)`

5.119.1 Member Function Documentation

5.119.1.1 `SystemMessageReceiver navigators.smart.com.system.SystemMessageReceiverFactory.createServerMessageReceiver (int remoteid)`

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

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

- modular-smart/src/navigators/smart/com/system/SystemMessageReceiverFactory.java

5.120 navigators.smart.communication.server.Test Class Reference

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

5.120.1 Member Function Documentation

5.120.1.1 `static void navigators.smart.communication.server.Test.main (String[] args) throws Exception` [static]

Parameters

<i>args</i>	the command line arguments
-------------	----------------------------

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

- modular-smart/test/navigators/smart/communication/server/Test.java

5.121 navigators.smart.communication.server.TestSerialization Class Reference

Public Member Functions

- .junit.Test void [TomSerialisationTest](#) ()

5.121.1 Member Function Documentation

5.121.1.1 .junit.Test void navigators.smart.communication.server.TestSerialization.TomSerialisationTest ()

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

- modular-smart/test/navigators/smart/communication/server/TestSerialization.java

5.122 navigators.smart.consensus.ComMessageHub< S extends ConsensusService > Class Reference

Classes

- interface [Message](#)< S extends ConsensusService >

Public Member Functions

- [ComMessageHub](#) (S service, [ComMessageSender](#) msgsender, int queuesize)
- void [start](#) ()
- void [receivedMessage](#) (Message<?super S > msg)
- void [send](#) (int target, Message<?super S > msg)
- void [send](#) (Iterable< Integer > targets, Message<?super S > msg)

5.122.1 Constructor & Destructor Documentation

5.122.1.1 navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.ComMessageHub (S service, ComMessageSender msgsender, int queuesize)

5.122.2 Member Function Documentation

5.122.2.1 void navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.receivedMessage (Message<?super S > msg)

5.122.2.2 void navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.send (int target, Message<?super S > msg)

5.122.2.3 void navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.send (Iterable< Integer > targets, Message<?super S > msg)

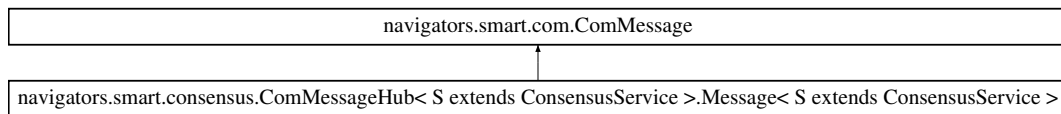
5.122.2.4 void navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.start ()

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

- modular-smart/src/navigators/smart/consensus/ComMessageHub.java

5.123 navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.Message< S extends ConsensusService > Interface Reference

Inheritance diagram for navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.Message< S extends ConsensusService >:



Public Member Functions

- void [process](#) (S service)

5.123.1 Member Function Documentation

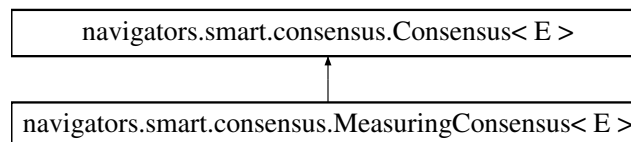
5.123.1.1 void navigators.smart.consensus.ComMessageHub< S extends ConsensusService >.Message< S extends ConsensusService >.process (S service)

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

- modular-smart/src/navigators/smart/consensus/ComMessageHub.java

5.124 navigators.smart.consensus.Consensus< E > Class Reference

Inheritance diagram for navigators.smart.consensus.Consensus< E >:



Public Member Functions

- [Consensus](#) (long eid)
- [Consensus](#) (long eid, boolean forcescp)
- void [decided](#) (byte[] decision, int round)
- int [getDecisionRound](#) ()
- byte[] [getDecision](#) ()
- void [setDeserialisedDecision](#) (E deserialised)
- E [getDeserializedDecision](#) ()

- long `getId` ()
- boolean `forcesCheckpoint` ()
- String `toString` ()
- int `hashCode` ()
- boolean `equals` (Object obj)

5.124.1 Detailed Description

This class represents a Consensus Instance.

Parameters

<code><E></code>	Type of the decided Object
------------------------	----------------------------

5.124.2 Constructor & Destructor Documentation

5.124.2.1 `navigators.smart.consensus.Consensus< E >.Consensus (long eid)`

5.124.2.2 `navigators.smart.consensus.Consensus< E >.Consensus (long eid, boolean forcescp)`

5.124.3 Member Function Documentation

5.124.3.1 `void navigators.smart.consensus.Consensus< E >.decided (byte[] decision, int round)`

5.124.3.2 `boolean navigators.smart.consensus.Consensus< E >.equals (Object obj)`

5.124.3.3 `boolean navigators.smart.consensus.Consensus< E >.forcesCheckpoint ()`

5.124.3.4 `byte [] navigators.smart.consensus.Consensus< E >.getDecision ()`

Gets the serialized decided value

Returns

Decided Value

5.124.3.5 `int navigators.smart.consensus.Consensus< E >.getDecisionRound ()`

5.124.3.6 `E navigators.smart.consensus.Consensus< E >.getDeserializedDecision ()`

Blocks until a decision has been reached. Returns null if the decision was not yet deserialized, otherwise it returns the decision

Returns

The deserialized decided value, null if the decision wasn't deserialized yet.

5.124.3.7 `long navigators.smart.consensus.Consensus< E >.getId ()`

The Execution ID for this consensus

Returns

Execution ID for this consensus

5.124.3.8 `int navigators.smart.consensus.Consensus< E >.hashCode ()`

5.124.3.9 `void navigators.smart.consensus.Consensus< E >.setDeserialisedDecision (E deserialised)`

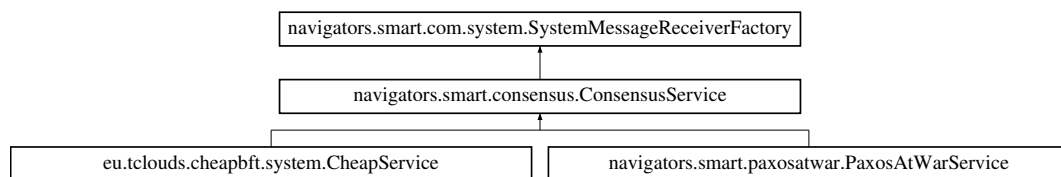
5.124.3.10 `String navigators.smart.consensus.Consensus< E >.toString ()`

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

- modular-smart/src/navigators/smart/consensus/Consensus.java

5.125 navigators.smart.consensus.ConsensusService Interface Reference

Inheritance diagram for navigators.smart.consensus.ConsensusService:



Public Member Functions

- void [proposeRequests](#) ()
- void [requestDecided](#) (TOMMessage msg)
- int [getProcessID](#) ()
- void [deliverState](#) (TransferableState state)
- int [getProposer](#) (Consensus<?> cons)
- void [startDeliverState](#) ()
- void [consensusDelivered](#) (Consensus<?> cons)
- void [start](#) () throws IOException, InterruptedException
- byte[] [getState](#) (Consensus<?> cons)
- void [requestReplied](#) (ServiceResult res, TOMMessage reply, MessageDigest digest)
- void [requestExecuted](#) (ServiceResult res)
- int [numberOfActiveReplicas](#) ()
- int [numberOfFullReplies](#) ()
- boolean [isProposer](#) ()
- void [createCheckpoint](#) (Consensus<?> cons, ServiceCheckpoint scp)
- void [sendCheckpointRequest](#) ()
- void [processStateManagementMessage](#) (SMMessage msg)
- void [processTimeoutMessage](#) (RTMessage msg)
- void [processForwardedMessage](#) (ForwardedMessage msg)
- void [processRecoveryMessage](#) (RequestRecoveryMessage msg)

5.125.1 Detailed Description

This Interface represents a generic [ConsensusService](#) to be used by the TOMLayer to provide total order multicast despite f byzantine failures.

5.125.2 Member Function Documentation

5.125.2.1 void navigators.smart.consensus.ConsensusService.consensusDelivered (Consensus<?> cons)

Called when the TOMLayer finished the delivery of the request and notified the consensuslayer of all the batched requests that where decided with this consensus.

Parameters

<i>cons</i>	The finished consensus.
-------------	-------------------------

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.2 void navigators.smart.consensus.ConsensusService.createCheckpoint (Consensus<?> cons, ServiceCheckpoint scp)

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

5.125.2.3 void navigators.smart.consensus.ConsensusService.deliverState (TransferableState state)

Notifies the service of a successful state transfer to indicate leaderchanges and so on. The decided requests need to be indicated seperately because the consensus doesn't know the internal structure of the batches and therefor cannot see which single requests where decided in the transferred state.

Parameters

<i>state</i>	
--------------	--

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.4 int navigators.smart.consensus.ConsensusService.getProcessID ()

Returns the id of this replicas consensus service

Returns

The consensuservice id

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.5 int navigators.smart.consensus.ConsensusService.getProposer (Consensus<?> cons)

Returns the id of the leader of the given round

Parameters

<i>cons</i>	The Consensus that we wish to get the Proposer for
-------------	--

Returns

The id of the leader for the given consensus

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

5.125.2.6 `byte [] navigators.smart.consensus.ConsensusService.getState (Consensus<?> cons)`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.7 `boolean navigators.smart.consensus.ConsensusService.isProposer ()`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.8 `int navigators.smart.consensus.ConsensusService.numberOfActiveReplicas ()`

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

5.125.2.9 `int navigators.smart.consensus.ConsensusService.numberOfFullReplies ()`

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

5.125.2.10 `void navigators.smart.consensus.ConsensusService.processForwardedMessage (ForwardedMessage msg)`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.11 `void navigators.smart.consensus.ConsensusService.processRecoveryMessage (RequestRecoveryMessage msg)`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.12 `void navigators.smart.consensus.ConsensusService.processStateManagementMessage (SMMMessage msg)`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.13 `void navigators.smart.consensus.ConsensusService.processTimeoutMessage (RTMessage msg)`

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.14 `void navigators.smart.consensus.ConsensusService.proposeRequests ()`

Returns the number of the last successfully decided round

Returns

The roundnumber of the last descision Notifies the service of a new request to be decided. This is needed to detect malicious leaders that do not propose messages from some clients.

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.15 `void navigators.smart.consensus.ConsensusService.requestDecided (TOMMessage msg)`

Notifies the service that the given request has been decided. This happens if we receive a state transfer

Parameters

<i>msg</i>	
------------	--

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.16 void [navigators.smart.consensus.ConsensusService.requestExecuted \(ServiceResult res \)](#)

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.17 void [navigators.smart.consensus.ConsensusService.requestReplied \(ServiceResult res, TOMMessage reply, MessageDigest digest \)](#)

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.18 void [navigators.smart.consensus.ConsensusService.sendCheckpointRequest \(\)](#)

Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

5.125.2.19 void [navigators.smart.consensus.ConsensusService.start \(\)](#) throws IOException, InterruptedException

Implemented in [navigators.smart.paxosatwar.PaxosAtWarService](#), and [eu.tclouds.cheapbft.system.CheapService](#).

5.125.2.20 void [navigators.smart.consensus.ConsensusService.startDeliverState \(\)](#)

Indicates that the layer that uses the service starts to deliver a state

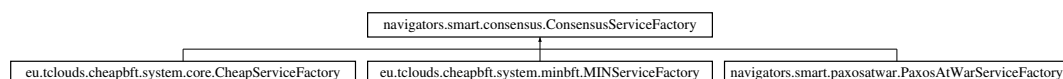
Implemented in [eu.tclouds.cheapbft.system.CheapService](#), and [navigators.smart.paxosatwar.PaxosAtWarService](#).

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

- modular-smart/src/navigators/smart/consensus/ConsensusService.java

5.126 navigators.smart.consensus.ConsensusServiceFactory Interface Reference

Inheritance diagram for [navigators.smart.consensus.ConsensusServiceFactory](#):



Public Member Functions

- [ConsensusService newInstance \(TOMLayer tomLayer\)](#) throws ConfigurationException

5.126.1 Member Function Documentation

5.126.1.1 **ConsensusService** [navigators.smart.consensus.ConsensusServiceFactory.newInstance \(TOMLayer tomLayer \)](#) throws ConfigurationException

Creates a new Instance of a [ConsensusService](#)

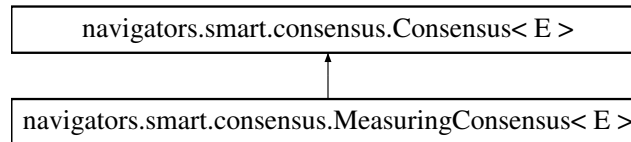
Implemented in [eu.tclouds.cheapbft.system.minbft.MINServiceFactory](#), [eu.tclouds.cheapbft.system.core.CheapServiceFactory](#), and [navigators.smart.paxosatwar.PaxosAtWarServiceFactory](#).

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

- modular-smart/src/navigators/smart/consensus/ConsensusServiceFactory.java

5.127 navigators.smart.consensus.MeasuringConsensus< E > Class Reference

Inheritance diagram for navigators.smart.consensus.MeasuringConsensus< E >:



Public Member Functions

- [MeasuringConsensus](#) (long *eid*, long *startTime*)

Public Attributes

- long *startTime*
- long *executionTime*
- int *batchSize* =0

5.127.1 Detailed Description

This class stands for an instance of a consensus which measures the executiontime

Parameters

<E>	Type of the decidedupon values
-----	--------------------------------

5.127.2 Constructor & Destructor Documentation

5.127.2.1 navigators.smart.consensus.MeasuringConsensus< E >.MeasuringConsensus (long *eid*, long *startTime*)

Creates a new instance of MeasuringConsensus

Parameters

<i>eid</i>	The execution ID for this consensus
<i>startTime</i>	The consensus start time

5.127.3 Member Data Documentation

5.127.3.1 int navigators.smart.consensus.MeasuringConsensus< E >.batchSize =0

5.127.3.2 long navigators.smart.consensus.MeasuringConsensus< E >.executionTime

5.127.3.3 long navigators.smart.consensus.MeasuringConsensus< E >.startTime

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

- modular-smart/src/navigators/smart/consensus/MeasuringConsensus.java

5.128 navigators.smart.demo.CounterClient Class Reference

Static Public Member Functions

- static void [main](#) (String[] args) throws IOException

5.128.1 Detailed Description

Example client that updates a BFT replicated service (a counter).

5.128.2 Member Function Documentation

5.128.2.1 static void `navigators.smart.demo.CounterClient.main (String[] args)` throws IOException [static]

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

- modular-smart/src/navigators/smart/demo/CounterClient.java

5.129 navigators.smart.demo.CounterClientExt Class Reference

Static Public Member Functions

- static void [main](#) (String[] args) throws IOException
- static double [mean](#) (long[] a)

5.129.1 Detailed Description

Example client that updates a BFT replicated service (a counter).

5.129.2 Member Function Documentation

5.129.2.1 static void `navigators.smart.demo.CounterClientExt.main (String[] args)` throws IOException [static]

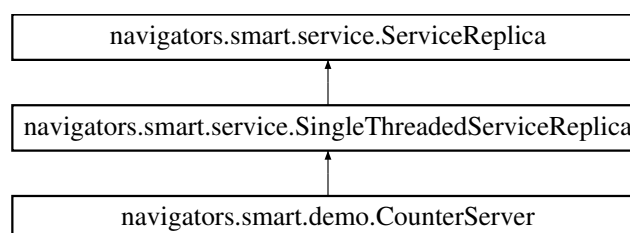
5.129.2.2 static double `navigators.smart.demo.CounterClientExt.mean (long[] a)` [static]

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

- modular-smart/src/navigators/smart/demo/CounterClientExt.java

5.130 navigators.smart.demo.CounterServer Class Reference

Inheritance diagram for `navigators.smart.demo.CounterServer`:



Public Member Functions

- [CounterServer](#) (int id, boolean useSpin) throws ConfigurationException
- [ServiceResult executeCommand](#) (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceCheckpoint createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)

Additional Inherited Members

5.130.1 Detailed Description

Example replica that implements a BFT replicated service (a counter).

5.130.2 Constructor & Destructor Documentation

5.130.2.1 `navigators.smart.demo.CounterServer.CounterServer (int id, boolean useSpin)` throws **ConfigurationException**

5.130.3 Member Function Documentation

5.130.3.1 `void navigators.smart.demo.CounterServer.applyUpdate (ServiceStateUpdate update)` [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.130.3.2 **ServiceCheckpoint** `navigators.smart.demo.CounterServer.createCheckpoint ()` [protected], [virtual]

ISTO E CODIGO DO JOAO, PARA TRATAR DOS CHECKPOINTS

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.130.3.3 **ServiceResult** `navigators.smart.demo.CounterServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` [virtual]

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.130.3.4 `void navigators.smart.demo.CounterServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

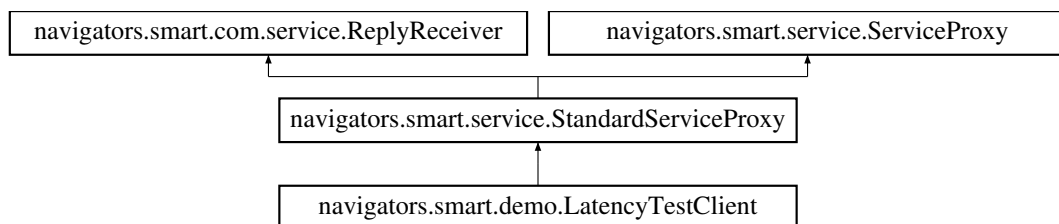
5.130.3.5 `static void navigators.smart.demo.CounterServer.main (String[] args)` throws `Exception` `[static]`

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

- modular-smart/src/navigators/smart/demo/CounterServer.java

5.131 navigators.smart.demo.LatencyTestClient Class Reference

Inheritance diagram for `navigators.smart.demo.LatencyTestClient`:



Public Member Functions

- [LatencyTestClient](#) (int id, int exec, int argSize, int interval, boolean readOnly)
- void [run](#) ()
- void [receivedReply](#) (TOMMessage reply)

Static Public Member Functions

- static void [main](#) (String[] args)

Additional Inherited Members

5.131.1 Constructor & Destructor Documentation

5.131.1.1 `navigators.smart.demo.LatencyTestClient.LatencyTestClient (int id, int exec, int argSize, int interval, boolean readOnly)`

5.131.2 Member Function Documentation

5.131.2.1 `static void navigators.smart.demo.LatencyTestClient.main (String[] args)` `[static]`

5.131.2.2 void navigators.smart.demo.LatencyTestClient.receivedReply (TOMMessage *reply*)

This is the method invoked by the client side communication system, and where the code to handle the reply is to be written

Parameters

<i>reply</i>	The reply delivered by the client side communication system
--------------	---

Implements [navigators.smart.com.service.ReplyReceiver](#).

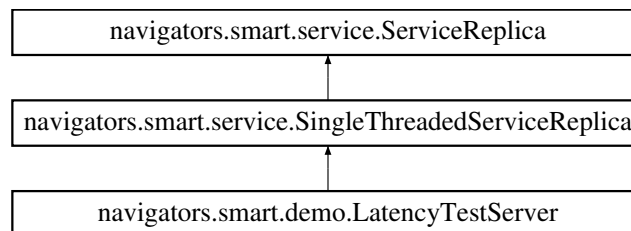
5.131.2.3 void navigators.smart.demo.LatencyTestClient.run ()

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

- modular-smart/src/navigators/smart/demo/LatencyTestClient.java

5.132 navigators.smart.demo.LatencyTestServer Class Reference

Inheritance diagram for navigators.smart.demo.LatencyTestServer:



Public Member Functions

- [LatencyTestServer](#) (int id) throws ConfigurationException
- void [receiveOrderedMessage](#) (TOMMessage msg)
- void [receiveServiceRequest](#) (TOMMessage msg)
- [ServiceCheckpoint](#) [createCheckpointObs](#) ()
- void [receiveCheckpoint](#) ([ServiceCheckpoint](#) cp)
- [ServiceResult](#) [executeCommand](#) (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceCheckpoint](#) [createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)

Additional Inherited Members

5.132.1 Constructor & Destructor Documentation

5.132.1.1 `navigators.smart.demo.LatencyTestServer.LatencyTestServer (int id)` throws `ConfigurationException`

Creates a new instance of `TOMServerPerformanceTest`

5.132.2 Member Function Documentation

5.132.2.1 `void navigators.smart.demo.LatencyTestServer.applyUpdate (ServiceStateUpdate update)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.132.2.2 **ServiceCheckpoint** `navigators.smart.demo.LatencyTestServer.createCheckpoint ()` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.132.2.3 **ServiceCheckpoint** `navigators.smart.demo.LatencyTestServer.createCheckpointObs ()`

Implements [navigators.smart.service.ServiceReplica](#).

5.132.2.4 **ServiceResult** `navigators.smart.demo.LatencyTestServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` `[virtual]`

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method **MUST** use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.132.2.5 `void navigators.smart.demo.LatencyTestServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.132.2.6 `static void navigators.smart.demo.LatencyTestServer.main (String[] args)` throws `Exception` `[static]`

5.132.2.7 void `navigators.smart.demo.LatencyTestServer.receiveCheckpoint (ServiceCheckpoint cp)`

Implements [navigators.smart.service.ServiceReplica](#).

5.132.2.8 void `navigators.smart.demo.LatencyTestServer.receiveOrderedMessage (TOMMessage msg)`

5.132.2.9 void `navigators.smart.demo.LatencyTestServer.receiveServiceRequest (TOMMessage msg)`

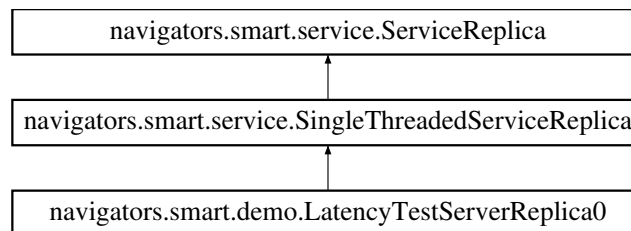
Implements [navigators.smart.service.ServiceReplica](#).

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

- modular-smart/src/navigators/smart/demo/LatencyTestServer.java

5.133 navigators.smart.demo.LatencyTestServerReplica0 Class Reference

Inheritance diagram for `navigators.smart.demo.LatencyTestServerReplica0`:



Public Member Functions

- [LatencyTestServerReplica0](#) (int id) throws `ConfigurationException`
- void [receiveOrderedMessage](#) (`TOMMessage` msg)
- [ServiceCheckpoint](#) [createCheckpointObs](#) ()
- void [receiveCheckpoint](#) (`ServiceCheckpoint` cp)
- void [receiveServiceRequest](#) (`TOMMessage` msg)
- [ServiceResult](#) [executeCommand](#) (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)

Static Public Member Functions

- static void [main](#) (`String[]` args) throws `Exception`

Protected Member Functions

- [ServiceCheckpoint](#) [createCheckpoint](#) ()
- void [loadCheckpoint](#) (`ServiceCheckpoint` cp)
- void [applyUpdate](#) (`ServiceStateUpdate` update)

Additional Inherited Members

5.133.1 Constructor & Destructor Documentation

5.133.1.1 `navigators.smart.demo.LatencyTestServerReplica0.LatencyTestServerReplica0 (int id)` throws `ConfigurationException`

Creates a new instance of `TOMServerPerformanceTest`

5.133.2 Member Function Documentation

5.133.2.1 `void navigators.smart.demo.LatencyTestServerReplica0.applyUpdate (ServiceStateUpdate update)` [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.133.2.2 `ServiceCheckpoint navigators.smart.demo.LatencyTestServerReplica0.createCheckpoint ()` [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.133.2.3 `ServiceCheckpoint navigators.smart.demo.LatencyTestServerReplica0.createCheckpointObs ()`

Implements [navigators.smart.service.ServiceReplica](#).

5.133.2.4 `ServiceResult navigators.smart.demo.LatencyTestServerReplica0.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` [virtual]

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.133.2.5 `void navigators.smart.demo.LatencyTestServerReplica0.loadCheckpoint (ServiceCheckpoint cp)` [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.133.2.6 `static void navigators.smart.demo.LatencyTestServerReplica0.main (String[] args)` throws `Exception` [static]

5.133.2.7 `void navigators.smart.demo.LatencyTestServerReplica0.receiveCheckpoint (ServiceCheckpoint cp)`

Implements [navigators.smart.service.ServiceReplica](#).

5.133.2.8 void navigators.smart.demo.LatencyTestServerReplica0.receiveOrderedMessage (TOMMessage msg)

5.133.2.9 void navigators.smart.demo.LatencyTestServerReplica0.receiveServiceRequest (TOMMessage msg)

Implements [navigators.smart.service.ServiceReplica](#).

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

- modular-smart/src/navigators/smart/demo/LatencyTestServerReplica0.java

5.134 navigators.smart.demo.RandomClient Class Reference

Static Public Member Functions

- static void [main](#) (String[] args) throws IOException

5.134.1 Member Function Documentation

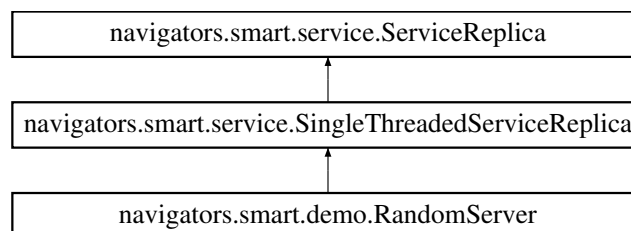
5.134.1.1 static void navigators.smart.demo.RandomClient.main (String[] args) throws IOException [static]

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

- modular-smart/src/navigators/smart/demo/RandomClient.java

5.135 navigators.smart.demo.RandomServer Class Reference

Inheritance diagram for navigators.smart.demo.RandomServer:



Public Member Functions

- [RandomServer](#) (int id) throws ConfigurationException
- [ServiceResult](#) [executeCommand](#) (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceCheckpoint](#) [createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)

Additional Inherited Members

5.135.1 Constructor & Destructor Documentation

5.135.1.1 `navigators.smart.demo.RandomServer.RandomServer (int id)` throws `ConfigurationException`

5.135.2 Member Function Documentation

5.135.2.1 `void navigators.smart.demo.RandomServer.applyUpdate (ServiceStateUpdate update)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.135.2.2 `ServiceCheckpoint navigators.smart.demo.RandomServer.createCheckpoint ()` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.135.2.3 `ServiceResult navigators.smart.demo.RandomServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` `[virtual]`

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.135.2.4 `void navigators.smart.demo.RandomServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

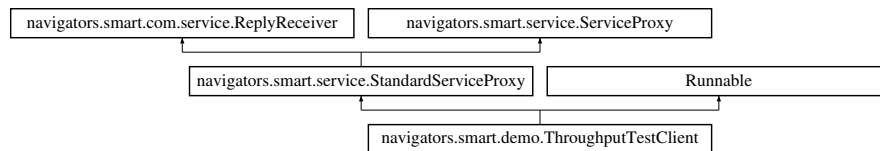
5.135.2.5 `static void navigators.smart.demo.RandomServer.main (String[] args)` throws `Exception` `[static]`

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

- modular-smart/src/navigators/smart/demo/RandomServer.java

5.136 navigators.smart.demo.ThroughputTestClient Class Reference

Inheritance diagram for `navigators.smart.demo.ThroughputTestClient`:



Public Member Functions

- [ThroughputTestClient](#) (int id, int exec, int argSize, int interval, [TOMConfiguration](#) conf)
- void [run](#) ()
- void [receivedReply](#) ([TOMMessage](#) reply)

Static Public Member Functions

- static void [main](#) (String[] args)

Additional Inherited Members

5.136.1 Constructor & Destructor Documentation

5.136.1.1 `navigators.smart.demo.ThroughputTestClient.ThroughputTestClient (int id, int exec, int argSize, int interval, TOMConfiguration conf)`

5.136.2 Member Function Documentation

5.136.2.1 `static void navigators.smart.demo.ThroughputTestClient.main (String[] args) [static]`

5.136.2.2 `void navigators.smart.demo.ThroughputTestClient.receivedReply (TOMMessage reply)`

This is the method invoked by the client side communication system, and where the code to handle the reply is to be written

Parameters

<i>reply</i>	The reply delivered by the client side comunication system
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Implements [navigators.smart.com.service.ReplyReceiver](#).

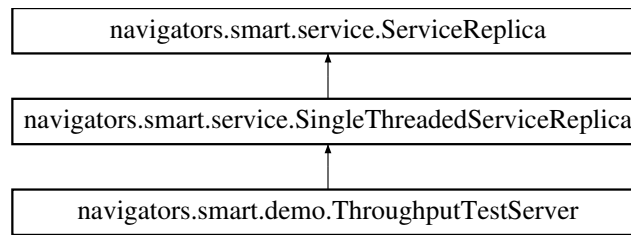
5.136.2.3 `void navigators.smart.demo.ThroughputTestClient.run ()`

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

- modular-smart/src/navigators/smart/demo/ThroughputTestClient.java

5.137 navigators.smart.demo.ThroughputTestServer Class Reference

Inheritance diagram for navigators.smart.demo.ThroughputTestServer:



Public Member Functions

- [ThroughputTestServer](#) (int id, int interval) throws ConfigurationException
- void [receiveOrderedMessage](#) (TOMMessage msg)
- [ServiceCheckpoint](#) createCheckpointObs ()
- void [receiveCheckpoint](#) (ServiceCheckpoint cp)
- void [receiveServiceRequest](#) (TOMMessage msg)
- [ServiceResult](#) executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- [ServiceCheckpoint](#) createCheckpoint ()
- void [loadCheckpoint](#) (ServiceCheckpoint cp)
- void [applyUpdate](#) (ServiceStateUpdate update)

Additional Inherited Members

5.137.1 Constructor & Destructor Documentation

- 5.137.1.1 [navigators.smart.demo.ThroughputTestServer.ThroughputTestServer](#) (int *id*, int *interval*) throws ConfigurationException

5.137.2 Member Function Documentation

- 5.137.2.1 void [navigators.smart.demo.ThroughputTestServer.applyUpdate](#) ([ServiceStateUpdate](#) *update*)
[protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

- 5.137.2.2 [ServiceCheckpoint](#) [navigators.smart.demo.ThroughputTestServer.createCheckpoint](#) () [protected],
[virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

- 5.137.2.3 [ServiceCheckpoint](#) [navigators.smart.demo.ThroughputTestServer.createCheckpointObs](#) ()

Implements [navigators.smart.service.ServiceReplica](#).

5.137.2.4 **ServiceResult** `navigators.smart.demo.ThroughputTestServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` `[virtual]`

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.137.2.5 **void** `navigators.smart.demo.ThroughputTestServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected], [virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.137.2.6 **static void** `navigators.smart.demo.ThroughputTestServer.main (String[] args)` **throws** **Exception** `[static]`

5.137.2.7 **void** `navigators.smart.demo.ThroughputTestServer.receiveCheckpoint (ServiceCheckpoint cp)`

Implements [navigators.smart.service.ServiceReplica](#).

5.137.2.8 **void** `navigators.smart.demo.ThroughputTestServer.receiveOrderedMessage (TOMMessage msg)`

5.137.2.9 **void** `navigators.smart.demo.ThroughputTestServer.receiveServiceRequest (TOMMessage msg)`

Implements [navigators.smart.service.ServiceReplica](#).

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

- modular-smart/src/navigators/smart/demo/ThroughputTestServer.java

5.138 navigators.smart.paxosatwar.executionmanager.Execution Class Reference

Public Member Functions

- long `getId ()`
- [ExecutionManager](#) `getManager ()`
- [MeasuringConsensus](#) `getConsensus ()`
- [Round](#) `getRound (int number)`
- [Round](#) `getRound (int number, boolean create)`
- void `removeRounds (int limit)`
- [Round](#) `getDecisionRound ()`

- [Round](#) [getLastRound](#) ()
- boolean [isDecided](#) ()
- void [waitUntilFinished](#) ()
- void [decided](#) ([Round](#) round)

Public Attributes

- ReentrantLock [lock](#) = new ReentrantLock()
- Object [sync](#) = new Object()
- boolean [finished](#) = false

Protected Member Functions

- [Execution](#) ([ExecutionManager](#) manager, [MeasuringConsensus](#) consensus, long [initialTimeout](#))

5.138.1 Detailed Description

This class stands for an execution of a consensus

5.138.2 Constructor & Destructor Documentation

- 5.138.2.1 `navigators.smart.paxosatwar.executionmanager.Execution.Execution (ExecutionManager manager, MeasuringConsensus consensus, long initialTimeout)` [protected]

Creates a new instance of [Execution](#) for Acceptor Manager

Parameters

<i>manager</i>	Execution manager for this execution
<i>consensus</i>	MeasuringConsensus instance to which this execution works for
<i>initialTimeout</i>	Initial timeout for rounds

5.138.3 Member Function Documentation

- 5.138.3.1 `void navigators.smart.paxosatwar.executionmanager.Execution.decided (Round round)`

Called by the Acceptor, to set the decided value. If the Propose for the round was not yet received the execution is postponed until the decide arrives and this method is called again.

Parameters

<i>value</i>	The decided value
<i>round</i>	The round at which a decision was made

- 5.138.3.2 `MeasuringConsensus navigators.smart.paxosatwar.executionmanager.Execution.getConsensus ()`

This is the consensus instance to which this execution works for

Returns

[MeasuringConsensus](#) instance to which this execution works for

5.138.3.3 Round navigators.smart.paxosatwar.executionmanager.Execution.getDecisionRound ()

The round at which a decision was possible to make

Returns

[Round](#) at which a decision was possible to make

5.138.3.4 long navigators.smart.paxosatwar.executionmanager.Execution.getId ()

This is the execution ID

Returns

[Execution](#) ID

5.138.3.5 Round navigators.smart.paxosatwar.executionmanager.Execution.getLastRound ()

The last round of this execution

Returns

Last round of this execution

5.138.3.6 ExecutionManager navigators.smart.paxosatwar.executionmanager.Execution.getManager ()

This is the execution manager for this execution

Returns

[Execution](#) manager for this execution

5.138.3.7 Round navigators.smart.paxosatwar.executionmanager.Execution.getRound (int *number*)

Gets a round associated with this execution

Parameters

<i>number</i>	The number of the round
---------------	-------------------------

Returns

The round

5.138.3.8 Round navigators.smart.paxosatwar.executionmanager.Execution.getRound (int *number*, boolean *create*)

Gets a round associated with this execution

Parameters

<i>number</i>	The number of the round
<i>create</i>	if the round is to be created if not existent

Returns

The round

5.138.3.9 `boolean navigators.smart.paxosatwar.executionmanager.Execution.isDecided ()`

Informs wether or not the execution is decided

Returns

True if it is decided, false otherwise

5.138.3.10 `void navigators.smart.paxosatwar.executionmanager.Execution.removeRounds (int limit)`

Removes rounds greater than 'limit' from this execution

Parameters

<i>limit</i>	Rounds that should be kept (from 0 to 'limit')
--------------	--

5.138.3.11 `void navigators.smart.paxosatwar.executionmanager.Execution.waitUntilFinished ()`

5.138.4 Member Data Documentation

5.138.4.1 `boolean navigators.smart.paxosatwar.executionmanager.Execution.finished = false`

5.138.4.2 `ReentrantLock navigators.smart.paxosatwar.executionmanager.Execution.lock = new ReentrantLock()`

5.138.4.3 `Object navigators.smart.paxosatwar.executionmanager.Execution.sync = new Object()`

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/Execution.java

5.139 navigators.smart.paxosatwar.executionmanager.ExecutionManager Class Reference**Public Member Functions**

- [ExecutionManager](#) ([Acceptor](#) acceptor, [Proposer](#) proposer, List< Integer > acceptors, int f, int me, long initialTimeout, [TOMLayer](#) tom, [LeaderModule](#) lm)
- void [setRequestHandler](#) ([RequestHandler](#) reqhandlr)
- [TOMLayer](#) [getTOMLayer](#) ()
- int [getProcessId](#) ()
- List< Integer > [getAcceptors](#) ()
- List< Integer > [getOtherAcceptors](#) ()
- [Acceptor](#) [getAcceptor](#) ()
- [Proposer](#) [getProposer](#) ()
- void [stop](#) ()
- void [restart](#) ()
- final boolean [checkLimits](#) ([PaxosMessage](#) msg)
- boolean [thereArePendentMessages](#) (long eid)

- [Execution removeExecution](#) (long id)
- void [removeOutOfContexts](#) (long currentId)
- [Execution getExecution](#) (long eid)
- void [processOOCTMessages](#) ([Execution](#) execution)
- String [toString](#) ()
- [RequestHandler getRequestHandler](#) ()
- void [decided](#) (Consensus<?> cons)
- void [deliverState](#) ([TransferableState](#) state)

Public Attributes

- final int [quorumF](#)
- final int [quorum2F](#)
- final int [quorumStrong](#)
- final int [quorumFastDecide](#)

5.139.1 Detailed Description

This classe manages consensus instances. Each execution is a consensus instance. It can have several rounds if there were problems during consensus.

5.139.2 Constructor & Destructor Documentation

5.139.2.1 `navigators.smart.paxosatwar.executionmanager.ExecutionManager.ExecutionManager (Acceptor acceptor, Proposer proposer, List< Integer > acceptors, int f, int me, long initialTimeout, TOMLayer tom, LeaderModule lm)`

Creates a new instance of [ExecutionManager](#)

Parameters

<i>acceptor</i>	Acceptor role of the PaW algorithm
<i>proposer</i>	Proposer role of the PaW algorithm
<i>acceptors</i>	Process ID's of all replicas, including this one
<i>f</i>	Maximum number of replicas that can be faulty
<i>me</i>	This process ID
<i>initialTimeout</i>	initial timeout for rounds
<i>tom</i>	The Tomlayer that is used by this instance

5.139.3 Member Function Documentation

5.139.3.1 `final boolean navigators.smart.paxosatwar.executionmanager.ExecutionManager.checkLimits (PaxosMessage msg)`

Checks if this message can execute now. If it is not possible, it is stored in `outOfContextMessages`

Parameters

<i>msg</i>	the received message
------------	----------------------

Returns

true in case the message can be executed, false otherwise

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ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

5.139.3.2 void navigators.smart.paxosatwar.executionmanager.ExecutionManager.decided (Consensus<?> cons)

5.139.3.3 void navigators.smart.paxosatwar.executionmanager.ExecutionManager.deliverState (TransferableState state)

5.139.3.4 **Acceptor** navigators.smart.paxosatwar.executionmanager.ExecutionManager.getAcceptor ()

Returns the acceptor role of the PaW algorithm

Returns

The acceptor role of the PaW algorithm

5.139.3.5 List<Integer> navigators.smart.paxosatwar.executionmanager.ExecutionManager.getAcceptors ()

Returns the process ID's of all replicas, including this one

Returns

Array of the process ID's of all replicas, including this one

5.139.3.6 **Execution** navigators.smart.paxosatwar.executionmanager.ExecutionManager.getExecution (long eid)

Returns the specified consensus's execution. If it is not existant yet it is created. If there is a pending propose for this execution it will be handled and so will be any pending out of context message.

Parameters

<i>eid</i>	ID of the consensus's execution to be returned
------------	--

Returns

The consensus's execution specified

5.139.3.7 List<Integer> navigators.smart.paxosatwar.executionmanager.ExecutionManager.getOtherAcceptors ()

Returns the process ID's of all replicas, except this one

Returns

Array of the process ID's of all replicas, except this one

5.139.3.8 int navigators.smart.paxosatwar.executionmanager.ExecutionManager.getProcessId ()

Returns this process ID

Returns

This process ID

5.139.3.9 Proposer `navigators.smart.paxosatwar.executionmanager.ExecutionManager.getProposer ()`

Returns the Proposer role of this PaW algorithm

Returns

The proposer

5.139.3.10 RequestHandler `navigators.smart.paxosatwar.executionmanager.ExecutionManager.getRequestHandler ()`**5.139.3.11 TOMLayer** `navigators.smart.paxosatwar.executionmanager.ExecutionManager.getTOMLayer ()`

Returns the TOM layer associated with this execution manager

Returns

The TOM layer associated with this execution manager

5.139.3.12 void `navigators.smart.paxosatwar.executionmanager.ExecutionManager.processOOCSMessages (Execution execution)`**5.139.3.13 Execution** `navigators.smart.paxosatwar.executionmanager.ExecutionManager.removeExecution (long id)`

Removes a consensus's execution from this manager

Parameters

<i>id</i>	ID of the consensus's execution to be removed
-----------	---

Returns

The consensus's execution that was removed

5.139.3.14 void `navigators.smart.paxosatwar.executionmanager.ExecutionManager.removeOutOfContexts (long currentId)`

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO Removes all ooc messages including the ones with the currentId

Parameters

<i>currentId</i>	The Id up to which the oocs shall be removed.
------------------	---

5.139.3.15 void `navigators.smart.paxosatwar.executionmanager.ExecutionManager.restart ()`

Restarts this execution manager

5.139.3.16 void `navigators.smart.paxosatwar.executionmanager.ExecutionManager.setRequestHandler (RequestHandler reqhandlr)`**5.139.3.17 void** `navigators.smart.paxosatwar.executionmanager.ExecutionManager.stop ()`

Stops this execution manager

5.139.3.18 `boolean navigators.smart.paxosatwar.executionmanager.ExecutionManager.thereArePendentMessages (long eid)`

Informs if there are messages till to be processed associated the specified consensus's execution

Parameters

<i>eid</i>	The ID for the consensus execution in question
------------	--

Returns

True if there are still messages to be processed, false otherwise

5.139.3.19 `String navigators.smart.paxosatwar.executionmanager.ExecutionManager.toString ()`

5.139.4 Member Data Documentation

5.139.4.1 `final int navigators.smart.paxosatwar.executionmanager.ExecutionManager.quorum2F`

5.139.4.2 `final int navigators.smart.paxosatwar.executionmanager.ExecutionManager.quorumF`

5.139.4.3 `final int navigators.smart.paxosatwar.executionmanager.ExecutionManager.quorumFastDecide`

5.139.4.4 `final int navigators.smart.paxosatwar.executionmanager.ExecutionManager.quorumStrong`

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/ExecutionManager.java

5.140 `navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest` Class Reference

Public Member Functions

- void [setUp](#) ()
- void [testCheckLimits_initial](#) ()
- void [testCheckLimits_normal](#) ()
- void [testCheckLimits_initial_StateTransfer](#) ()
- void [testCheckLimits_normal_StateTransfer](#) ()
- void [testThereArePendentMessages](#) ()
- void [testRemoveExecution](#) ()
- void [testRemoveOutOfContexts](#) ()
- void [testGetExecution](#) ()
- void [testDecided](#) ()
- void [testDeliverState](#) ()

Package Attributes

- [Acceptor](#) `acceptor`
- [Proposer](#) `proposer`
- `int[] acceptors = {0,1,2,3}`
- `int f`
- `int me`

- long [initialTimeout](#)
- [TOMLayer](#) tom
- [LeaderModule](#) lm
- [RequestHandler](#) handlr

5.140.1 Member Function Documentation

- 5.140.1.1 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.setUp](#) ()
- 5.140.1.2 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testCheckLimits_initial](#) ()
- 5.140.1.3 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testCheckLimits_initial_StateTransfer](#) ()
- 5.140.1.4 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testCheckLimits_normal](#) ()
- 5.140.1.5 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testCheckLimits_normal_StateTransfer](#) ()
- 5.140.1.6 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testDecided](#) ()
- 5.140.1.7 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testDeliverState](#) ()
- 5.140.1.8 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testGetExecution](#) ()
- 5.140.1.9 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testRemoveExecution](#) ()
- 5.140.1.10 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testRemoveOutOfContexts](#) ()
- 5.140.1.11 void [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.testThereArePendentMessages](#) ()

5.140.2 Member Data Documentation

- 5.140.2.1 **Acceptor** [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.acceptor](#) [package]
- 5.140.2.2 int [] [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.acceptors](#) = {0,1,2,3} [package]
- 5.140.2.3 int [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.f](#) [package]
- 5.140.2.4 **RequestHandler** [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.handlr](#) [package]
- 5.140.2.5 long [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.initialTimeout](#) [package]
- 5.140.2.6 **LeaderModule** [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.lm](#) [package]
- 5.140.2.7 int [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.me](#) [package]
- 5.140.2.8 **Proposer** [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.proposer](#) [package]
- 5.140.2.9 **TOMLayer** [navigators.smart.paxosatwar.executionmanager.ExecutionManagerTest.tom](#) [package]

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

- modular-smart/test/navigators/smart/paxosatwar/executionmanager/ExecutionManagerTest.java

5.141 navigators.smart.paxosatwar.executionmanager.LeaderModule Class Reference

Public Member Functions

- [LeaderModule](#) ()
- synchronized void [addLeaderInfo](#) (long c, int r, int l)
- synchronized void [decided](#) (long c, int l)
- synchronized int [getLeader](#) (long c, int r)
- synchronized void [removeStableConsensusInfo](#) (long c)
- synchronized void [removeAllStableConsensusInfo](#) (long c)
- synchronized void [removeMultipleStableConsensusInfos](#) (long cStart, long cEnd)
- synchronized byte[] [getState](#) ()
- synchronized void [setState](#) (byte[] state) throws ClassNotFoundException

5.141.1 Detailed Description

This class manages information about the leader of each round of each consensus

5.141.2 Constructor & Destructor Documentation

5.141.2.1 navigators.smart.paxosatwar.executionmanager.LeaderModule.LeaderModule ()

Creates a new instance of [LeaderModule](#)

5.141.3 Member Function Documentation

5.141.3.1 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.addLeaderInfo (long c, int r, int l)

Adds information about a leader

Parameters

<i>c</i>	Consensus where the replica is a leader
<i>r</i>	Rounds of the consensus where the replica is a leader
<i>l</i>	ID of the leader

5.141.3.2 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.decided (long c, int l)

Invoked by the acceptor object when a value is decided It adds a new tuple to the list, which corresponds to the next consensus

Parameters

<i>c</i>	ID of the consensus established as being decided
<i>l</i>	ID of the replica established as being the leader for the round 0 of the next consensus

5.141.3.3 synchronized int navigators.smart.paxosatwar.executionmanager.LeaderModule.getLeader (long c, int r)

Retrieves the replica ID of the leader for the specified consensus's execution ID and round number TODO: Isto e mais do que um getter. Sera q nao se devia mudar isto?

Parameters

<i>c</i>	consensus's execution ID
<i>r</i>	Round number for the specified consensus

Returns

The replica ID of the leader

5.141.3.4 synchronized byte [] navigators.smart.paxosatwar.executionmanager.LeaderModule.getState ()

5.141.3.5 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.removeAllStableConsensusInfo (long *c*)

Removes all stable consensusinfos older than *c*

5.141.3.6 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.removeMultipleStableConsensusInfos (long *cStart*, long *cEnd*)

5.141.3.7 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.removeStableConsensusInfo (long *c*)

5.141.3.8 synchronized void navigators.smart.paxosatwar.executionmanager.LeaderModule.setState (byte[] *state*) throws ClassNotFoundException

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/LeaderModule.java

5.142 navigators.smart.paxosatwar.executionmanager.ProofVerifier Class Reference

Public Member Functions

- [ProofVerifier](#) ([TOMConfiguration](#) conf)
- void [sign](#) ([CollectProof](#) cp)
- SignedObject [sign](#) ([RTCollect](#) trc)
- int [countProofs](#) ([CollectProof](#)[] proofs)
- byte[] [getGoodValue](#) (SignedObject[] proofs, boolean in)
- byte[] [getGoodValue](#) ([CollectProof](#)[] proofs, boolean in)
- boolean [good](#) (byte[] value, [CollectProof](#)[] proofs, boolean in)
- int [getNextExecRound](#) ([CollectProof](#)[] proof)
- boolean [validProof](#) (long eid, int round, [FreezeProof](#) proof)
- [CollectProof](#)[] [checkValid](#) (long eid, int round, [CollectProof](#)[] proofs)
- boolean [validSignature](#) ([CollectProof](#) so, int sender)
- boolean [isTheLeader](#) (int l, [CollectProof](#)[] proof)
- boolean [verifySignature](#) (SignedObject so, int sender)

5.142.1 Detailed Description

This class is used to process data relacioned with freezed rounds. Generate proposes - good values, verify the proposed values and so on...

5.142.2 Constructor & Destructor Documentation

5.142.2.1 `navigators.smart.paxosatwar.executionmanager.ProofVerifier.ProofVerifier (TOMConfiguration conf)`

Creates a new instance of [ProofVerifier](#)

Parameters

<i>conf</i>	TOM configuration
-------------	-------------------

5.142.3 Member Function Documentation

5.142.3.1 `CollectProof [] navigators.smart.paxosatwar.executionmanager.ProofVerifier.checkValid (long eid, int round, CollectProof[] proofs)`

Returns the valid proofs

Parameters

<i>eid</i>	Execution ID to match against the proofs
<i>round</i>	round number to match against the proofs
<i>proofs</i>	Proofs to be verified

Returns

Array the the valid proofs

5.142.3.2 `int navigators.smart.paxosatwar.executionmanager.ProofVerifier.countProofs (CollectProof[] proofs)`

Counts how many proofs are in the given array (how many are diferent from null)

Parameters

<i>proofs</i>	Array of proofs, which might have indexes pointing to null
---------------	--

Returns

Number of proofs in the array

5.142.3.3 `byte [] navigators.smart.paxosatwar.executionmanager.ProofVerifier.getGoodValue (SignedObject[] proofs, boolean in)`

Obtains the value that is considered to be good, as is specified by the PaW algorithm

Parameters

<i>proofs</i>	Signed proofs to be evaluated
<i>in</i>	True if the proofs to be evaluated are from the freezed consensus, false for the proofs from the next consensus

Returns

The value considered to be good, if any. If such value can't be found, null is returned

5.142.3.4 `byte [] navigators.smart.paxosatwar.executionmanager.ProofVerifier.getGoodValue (CollectProof[] proofs, boolean in)`

Obtains the value that is considered to be good, as is specified by the PaW algorithm

Parameters

<i>proofs</i>	Proofs to be evaluated
<i>in</i>	True if the proofs to be evaluated are from the freezed consensus, false for the proofs from the next consensus

Returns

The value considered to be good, if any. If such value can't be found, null is returned

5.142.3.5 `int navigators.smart.paxosatwar.executionmanager.ProofVerifier.getNextExecRound (CollectProof[] proof)`

Returns the round number of the next consensus's execution from an array of proofs

Parameters

<i>proof</i>	Array of proofs which gives out the round number of next consensus's execution
--------------	--

Returns

The number of the round, or -1 if there is not one executing

5.142.3.6 `boolean navigators.smart.paxosatwar.executionmanager.ProofVerifier.good (byte[] value, CollectProof[] proofs, boolean in)`

Called by acceptors to verify if some proposal is good, as specified by the PaW algorithm

Parameters

<i>value</i>	The proposed value
<i>proofs</i>	The proofs to check the value against
<i>in</i>	True if the proofs to be evaluated are from the freezed consensus, false for the proofs from the next consensus

Returns

True if the value is good, false otherwise

5.142.3.7 `boolean navigators.smart.paxosatwar.executionmanager.ProofVerifier.isTheLeader (int l, CollectProof[] proof)`

Checks if a replica is the leader, given an array of proofs.

Parameters

<i>l</i>	Replica to be checked
<i>proof</i>	Proofs to verify the leader against

Returns

True if 'l' is the leader, false otherwise

5.142.3.8 void navigators.smart.paxosatwar.executionmanager.ProofVerifier.sign (CollectProof *cp*)

Signs proofs of a freezed consensus

Parameters

<i>cp</i>	Proofs of a freezed consensus
-----------	-------------------------------

Returns

Signed proofs

5.142.3.9 SignedObject navigators.smart.paxosatwar.executionmanager.ProofVerifier.sign (RTCollect *trc*)

TODO: Nao sei para que serve nem o q e um RTCollect. Mas deve ser da difusao atomica

Parameters

<i>cp</i>	
-----------	--

Returns

Signed

5.142.3.10 boolean navigators.smart.paxosatwar.executionmanager.ProofVerifier.validProof (long *eid*, int *round*, FreezeProof *proof*)

Checks if this is a valid proof

Parameters

<i>eid</i>	Execution ID to match against the proof
<i>round</i>	round number to match against the proof
<i>proof</i>	Proof to be verified

Returns

True if valid, false otherwise

5.142.3.11 boolean navigators.smart.paxosatwar.executionmanager.ProofVerifier.validSignature (CollectProof *so*, int *sender*)

Checks if a signature is valid

Parameters

<i>so</i>	Signed object
<i>sender</i>	Replica that sent the signed object

Returns

True if the signature is valid, false otherwise

5.142.3.12 `boolean navigators.smart.paxosatwar.executionmanager.ProofVerifier.verifySignature (SignedObject so, int sender)`

Checks if a signature is valid

Parameters

<code>so</code>	Signed object
<code>sender</code>	Replica that sent the signed object

Returns

True if the signature is valid, false otherwise

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/ProofVerifier.java

5.143 navigators.smart.paxosatwar.executionmanager.Round Class Reference

Public Member Functions

- void [setRemoved](#) ()
- boolean [isRemoved](#) ()
- void [setCollectProof](#) (int acceptor, [CollectProof](#) proof)
- long [getTimeout](#) ()
- int [getNumber](#) ()
- [Execution](#) [getExecution](#) ()
- void [setTimeoutTask](#) (ScheduledFuture<?> timeoutTask)
- ScheduledFuture<?> [getTimeoutTask](#) ()
- boolean [isWeakSetted](#) (int acceptor)
- boolean [isStrongSetted](#) (int acceptor)
- boolean [isDecideSetted](#) (int acceptor)
- byte[] [getWeak](#) (int acceptor)
- byte[][] [getWeak](#) ()
- void [setWeak](#) (int acceptor, byte[] value)
- byte[] [getStrong](#) (int acceptor)
- byte[][] [getStrong](#) ()
- void [setStrong](#) (int acceptor, byte[] value)
- byte[] [getDecide](#) (int acceptor)
- byte[][] [getDecide](#) ()
- void [setDecide](#) (int acceptor, byte[] value)
- boolean [isCollected](#) ()
- void [collect](#) ()
- boolean [isFrozen](#) ()
- void [freeze](#) ()
- void [addFreeze](#) (int acceptor)
- int [countFreeze](#) ()
- int [countWeak](#) (byte[] value)
- int [countStrong](#) (byte[] value)

- int [countDecide](#) (byte[] value)
- String [toString](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)

Public Attributes

- byte[] [propValue](#) = null
- byte[] [propValueHash](#) = null
- [CollectProof](#)[] [proofs](#)

Protected Member Functions

- [Round](#) ([Execution](#) parent, int number, long timeout)

5.143.1 Detailed Description

This class stands for a round of an execution of a consensus

5.143.2 Constructor & Destructor Documentation

5.143.2.1 `navigators.smart.paxosatwar.executionmanager.Round.Round (Execution parent, int number, long timeout)`
[protected]

Creates a new instance of [Round](#) for acceptors

Parameters

<i>parent</i>	Execution to which this round belongs
<i>number</i>	Number of the round
<i>timeout</i>	Timeout duration for this round

5.143.3 Member Function Documentation

5.143.3.1 `void navigators.smart.paxosatwar.executionmanager.Round.addFreeze (int acceptor)`

Establishes that a replica locally freezed this round

Parameters

<i>acceptor</i>	replica that locally freezed this round
-----------------	---

5.143.3.2 `void navigators.smart.paxosatwar.executionmanager.Round.collect ()`

Establishes that a collect message for this round was already sent

5.143.3.3 `int navigators.smart.paxosatwar.executionmanager.Round.countDecide (byte[] value)`

Retrives the ammount of replicas that decided a specified value

Parameters

<i>value</i>	The value in question
--------------	-----------------------

Returns

Amount of replicas that decided the specified value

5.143.3.4 int navigators.smart.paxosatwar.executionmanager.Round.countFreeze ()

Retrieves the amount of replicas that locally freezed this round

Returns

Amount of replicas that locally freezed this round

5.143.3.5 int navigators.smart.paxosatwar.executionmanager.Round.countStrong (byte[] *value*)

Retrives the ammount of replicas from which this process strongly accepted a specified value

Parameters

<i>value</i>	The value in question
--------------	-----------------------

Returns

Amount of replicas from which this process strongly accepted the specified value

5.143.3.6 int navigators.smart.paxosatwar.executionmanager.Round.countWeak (byte[] *value*)

Retrives the ammount of replicas from which this process weakly accepted a specified value

Parameters

<i>value</i>	The value in question
--------------	-----------------------

Returns

Amount of replicas from which this process weakly accepted the specified value

5.143.3.7 boolean navigators.smart.paxosatwar.executionmanager.Round.equals (Object *obj*)

5.143.3.8 void navigators.smart.paxosatwar.executionmanager.Round.freeze ()

Establishes that this round is frozen

5.143.3.9 byte [] navigators.smart.paxosatwar.executionmanager.Round.getDecide (int *acceptor*)

Retrieves the decided value by the specified replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

The value decided by the specified replica

5.143.3.10 `byte [][] navigators.smart.paxosatwar.executionmanager.Round.getDecide ()`

Retrives all the decided values by all replicas

Returns

The values decided by all replicas

5.143.3.11 **Execution** `navigators.smart.paxosatwar.executionmanager.Round.getExecution ()`

Retrieves this round's execution

Returns

This round's execution

5.143.3.12 `int navigators.smart.paxosatwar.executionmanager.Round.getNumber ()`

Retrieves this round's number

Returns

This round's number

5.143.3.13 `byte [] navigators.smart.paxosatwar.executionmanager.Round.getStrong (int acceptor)`

Retrives the strongly accepted value from the specified replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

The value strongly accepted from the specified replica

5.143.3.14 `byte [][] navigators.smart.paxosatwar.executionmanager.Round.getStrong ()`

Retrives all strongly accepted values from all replicas

Returns

The values strongly accepted from all replicas

5.143.3.15 `long navigators.smart.paxosatwar.executionmanager.Round.getTimeout ()`

Retrieves the duration for the timeout

Returns

Duration for the timeout

5.143.3.16 `ScheduledFuture<?> navigators.smart.paxosatwar.executionmanager.Round.getTimeoutTask ()`

Retrieves the timeout associated with this round

Parameters

<i>timeoutTask</i>	The timeout associated with this round
--------------------	--

5.143.3.17 `byte [] navigators.smart.paxosatwar.executionmanager.Round.getWeak (int acceptor)`

Retrives the weakly accepted value from the specified replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

The value weakly accepted from the specified replica

5.143.3.18 `byte [][] navigators.smart.paxosatwar.executionmanager.Round.getWeak ()`

Retrives all weakly accepted value from all replicas

Returns

The values weakly accepted from all replicas

5.143.3.19 `int navigators.smart.paxosatwar.executionmanager.Round.hashCode ()`

5.143.3.20 `boolean navigators.smart.paxosatwar.executionmanager.Round.isCollected ()`

Indicates if a collect message for this round was already sent

Returns

True if done so, false otherwise

5.143.3.21 `boolean navigators.smart.paxosatwar.executionmanager.Round.isDecideSetted (int acceptor)`

Informs if there is a decided value from a replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

True if there is a decided value from a replica, false otherwise

5.143.3.22 `boolean navigators.smart.paxosatwar.executionmanager.Round.isFrozen ()`

Indicates if this round is frozen

Returns

True if so, false otherwise

5.143.3.23 `boolean navigators.smart.paxosatwar.executionmanager.Round.isRemoved ()`

Informes if this round was removed from its execution

Returns

True if it is removed, false otherwise

5.143.3.24 `boolean navigators.smart.paxosatwar.executionmanager.Round.isStrongSetted (int acceptor)`

Informes if there is a strongly accepted value from a replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

True if there is a strongly accepted value from a replica, false otherwise

5.143.3.25 `boolean navigators.smart.paxosatwar.executionmanager.Round.isWeakSetted (int acceptor)`

Informes if there is a weakly accepted value from a replica

Parameters

<i>acceptor</i>	The replica ID
-----------------	----------------

Returns

True if there is a weakly accepted value from a replica, false otherwise

5.143.3.26 `void navigators.smart.paxosatwar.executionmanager.Round.setCollectProof (int acceptor, CollectProof proof)`

Adds a collect proof from another replica

Parameters

<i>acceptor</i>	replica which sent the proof
<i>proof</i>	proof received

5.143.3.27 void navigators.smart.paxosatwar.executionmanager.Round.setDecide (int *acceptor*, byte[] *value*)

Sets the decided value by the specified replica

Parameters

<i>acceptor</i>	The replica ID
<i>value</i>	The value decided by the specified replica

5.143.3.28 void navigators.smart.paxosatwar.executionmanager.Round.setRemoved ()

Set this round as removed from its execution

5.143.3.29 void navigators.smart.paxosatwar.executionmanager.Round.setStrong (int *acceptor*, byte[] *value*)

Sets the strongly accepted value from the specified replica

Parameters

<i>acceptor</i>	The replica ID
<i>value</i>	The value strongly accepted from the specified replica

5.143.3.30 void navigators.smart.paxosatwar.executionmanager.Round.setTimeoutTask (ScheduledFuture<?> *timeoutTask*)

Sets the timeout associated with this round

Parameters

<i>timeoutTask</i>	The timeout associated with this round
--------------------	--

5.143.3.31 void navigators.smart.paxosatwar.executionmanager.Round.setWeak (int *acceptor*, byte[] *value*)

Sets the weakly accepted value from the specified replica

Parameters

<i>acceptor</i>	The replica ID
<i>value</i>	The value weakly accepted from the specified replica

5.143.3.32 String navigators.smart.paxosatwar.executionmanager.Round.toString ()

Print round information.

5.143.4 Member Data Documentation

5.143.4.1 CollectProof [] navigators.smart.paxosatwar.executionmanager.Round.proofs

5.143.4.2 byte [] navigators.smart.paxosatwar.executionmanager.Round.propValue = null

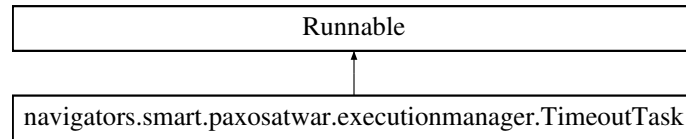
5.143.4.3 byte [] navigators.smart.paxosatwar.executionmanager.Round.propValueHash = null

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/Round.java

5.144 navigators.smart.paxosatwar.executionmanager.TimeoutTask Class Reference

Inheritance diagram for navigators.smart.paxosatwar.executionmanager.TimeoutTask:



Public Member Functions

- [TimeoutTask](#) ([Acceptor](#) acceptor, [Round](#) round)
- void [run](#) ()

5.144.1 Detailed Description

This class implements a timeout for consensus's rounds

5.144.2 Constructor & Destructor Documentation

5.144.2.1 [navigators.smart.paxosatwar.executionmanager.TimeoutTask.TimeoutTask](#) ([Acceptor](#) *acceptor*, [Round](#) *round*)

Creates a new instance of [TimeoutTask](#)

Parameters

<i>acceptor</i>	The acceptor role of the PaW algorithm
<i>round</i>	The round to which this timeout is related to

5.144.3 Member Function Documentation

5.144.3.1 void [navigators.smart.paxosatwar.executionmanager.TimeoutTask.run](#) ()

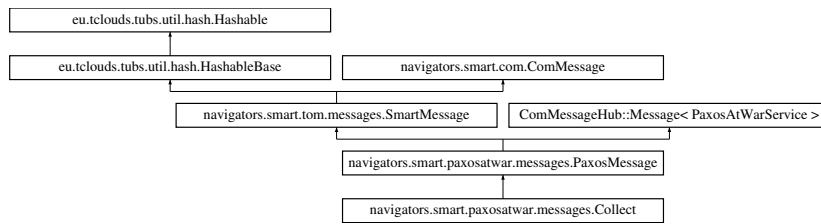
Runs this timer

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

- modular-smart/src/navigators/smart/paxosatwar/executionmanager/TimeoutTask.java

5.145 navigators.smart.paxosatwar.messages.Collect Class Reference

Inheritance diagram for navigators.smart.paxosatwar.messages.Collect:



Public Member Functions

- [Collect](#) (long id, int round, int from, [CollectProof](#) proof)
- [Collect](#) (ByteBuffer in)
- [CollectProof](#) [getProof](#) ()
- int [getPayloadSize](#) ()

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

Additional Inherited Members

5.145.1 Constructor & Destructor Documentation

5.145.1.1 `navigators.smart.paxosatwar.messages.Collect.Collect (long id, int round, int from, CollectProof proof)`

Creates a COLLECT message

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID
<i>proof</i>	The proof to be sent by the leader for all replicas

5.145.1.2 `navigators.smart.paxosatwar.messages.Collect.Collect (ByteBuffer in)`

5.145.2 Member Function Documentation

5.145.2.1 `int navigators.smart.paxosatwar.messages.Collect.getPayloadSize ()`

5.145.2.2 `CollectProof navigators.smart.paxosatwar.messages.Collect.getProof ()`

Returns the proof associated with this COLLECT message

Returns

The proof

5.145.2.3 `void navigators.smart.paxosatwar.messages.Collect.writePayloadTo (MessageSink sink)` [protected]

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

- modular-smart/src/navigators/smart/paxosatwar/messages/Collect.java

5.146 navigators.smart.paxosatwar.messages.CollectProof Class Reference

Public Member Functions

- [CollectProof](#) ([FreezeProof](#) proofIn, [FreezeProof](#) proofNext, int newLeader)
- [FreezeProof](#) [getProofs](#) (boolean in)
- int [getLeader](#) ()
- [CollectProof](#) (ByteBuffer in)
- void [serialise](#) ([MessageSink](#) out)
- int [getMsgSize](#) ()
- byte[] [getBytes](#) () throws IOException
- void [setSignature](#) (byte[] sign)
- byte[] [getSignature](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)

5.146.1 Detailed Description

Proofs to freezed consensus. This class can contain proofs for two consensus. The freezed one, and the next one (if have).

5.146.2 Constructor & Destructor Documentation

5.146.2.1 `navigators.smart.paxosatwar.messages.CollectProof.CollectProof (FreezeProof proofIn, FreezeProof proofNext, int newLeader)`

Creates a new instance of [CollectProof](#)

Parameters

<i>proofIn</i>	Proofs to freezed consensus
<i>proofNext</i>	Proofs to next consensus, if have next - after the freezed one
<i>newLeader</i>	The new leader id

5.146.2.2 `navigators.smart.paxosatwar.messages.CollectProof.CollectProof (ByteBuffer in)`

5.146.3 Member Function Documentation

5.146.3.1 `boolean navigators.smart.paxosatwar.messages.CollectProof.equals (Object obj)`

5.146.3.2 `byte [] navigators.smart.paxosatwar.messages.CollectProof.getBytes ()` throws IOException

5.146.3.3 `int navigators.smart.paxosatwar.messages.CollectProof.getLeader ()`

Retrieves the leader ID

Returns

The leader ID

5.146.3.4 `int navigators.smart.paxosatwar.messages.CollectProof.getMsgSize ()`

5.146.3.5 FreezeProof navigators.smart.paxosatwar.messages.CollectProof.getProofs (boolean *in*)

Retrieves the proof

Parameters

<i>in</i>	True for the proof of the freezed consensus, false for the proof of the next consensus
-----------	--

Returns

5.146.3.6 byte [] navigators.smart.paxosatwar.messages.CollectProof.getSignature ()

5.146.3.7 int navigators.smart.paxosatwar.messages.CollectProof.hashCode ()

5.146.3.8 void navigators.smart.paxosatwar.messages.CollectProof.serialise (MessageSink *out*)5.146.3.9 void navigators.smart.paxosatwar.messages.CollectProof.setSignature (byte[] *sign*)

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

- modular-smart/src/navigators/smart/paxosatwar/messages/CollectProof.java

5.147 navigators.smart.paxosatwar.messages.FreezeProof Class Reference

Public Member Functions

- [FreezeProof](#) (int *pid*, long *eid*, int *round*, byte[] *weak*, byte[] *strong*, byte[] *decide*)
- int [getPid](#) ()
- long [getEid](#) ()
- int [getRound](#) ()
- byte[] [getWeak](#) ()
- byte[] [getStrong](#) ()
- byte[] [getDecide](#) ()
- String [toString](#) ()
- [FreezeProof](#) (ByteBuffer *in*)
- void [serialise](#) (MessageSink *out*)
- int [getMsgSize](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object *obj*)

5.147.1 Detailed Description

Proofs for one (freezed) consensus.

5.147.2 Constructor & Destructor Documentation

5.147.2.1 navigators.smart.paxosatwar.messages.FreezeProof.FreezeProof (int *pid*, long *eid*, int *round*, byte[] *weak*, byte[] *strong*, byte[] *decide*)

Creates a new instance of [FreezeProof](#)

Parameters

<i>pid</i>	Replica ID
<i>eid</i>	Consensus's execution ID
<i>round</i>	Round number
<i>weak</i>	Weakly accepted value
<i>strong</i>	Strongly accepted Value
<i>decide</i>	Decided value

5.147.2.2 `navigators.smart.paxosatwar.messages.FreezeProof.FreezeProof (ByteBuffer in)`

5.147.3 Member Function Documentation

5.147.3.1 `boolean navigators.smart.paxosatwar.messages.FreezeProof.equals (Object obj)`

5.147.3.2 `byte [] navigators.smart.paxosatwar.messages.FreezeProof.getDecide ()`

Retrieves the decided value

Returns

Decided value

5.147.3.3 `long navigators.smart.paxosatwar.messages.FreezeProof.getEid ()`

Retrieves the consensus's execution ID

Returns

Consensus's execution ID

5.147.3.4 `int navigators.smart.paxosatwar.messages.FreezeProof.getMsgSize ()`

5.147.3.5 `int navigators.smart.paxosatwar.messages.FreezeProof.getPid ()`

Retrieves the replica ID

Returns

Replica ID

5.147.3.6 `int navigators.smart.paxosatwar.messages.FreezeProof.getRound ()`

Retrieves the round number

Returns

Round number

5.147.3.7 `byte [] navigators.smart.paxosatwar.messages.FreezeProof.getStrong ()`

Retrieves the strongly accepted value

Returns

Strongly accepted value

5.147.3.8 `byte [] navigators.smart.paxosatwar.messages.FreezeProof.getWeak ()`

Retrieves the weakly accepted value

Returns

Weakly accepted value

5.147.3.9 `int navigators.smart.paxosatwar.messages.FreezeProof.hashCode ()`

5.147.3.10 `void navigators.smart.paxosatwar.messages.FreezeProof.serialise (MessageSink out)`

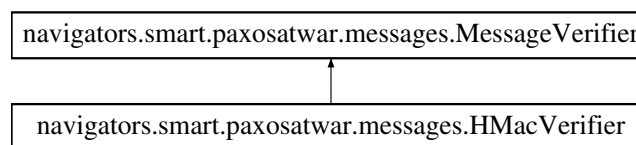
5.147.3.11 `String navigators.smart.paxosatwar.messages.FreezeProof.toString ()`

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

- modular-smart/src/navigators/smart/paxosatwar/messages/FreezeProof.java

5.148 navigators.smart.paxosatwar.messages.HMacVerifier Class Reference

Inheritance diagram for navigators.smart.paxosatwar.messages.HMacVerifier:



Public Member Functions

- [HMacVerifier](#) ()
- void [authenticateAndEstablishAuthKey](#) ()
- byte[] [generateHash](#) (List< byte[]> messageData)
- int [getHashSize](#) ()
- byte[] [verifyHash](#) (byte[] data, byte[] receivedHash)

5.148.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.148.2 Constructor & Destructor Documentation

5.148.2.1 `navigators.smart.paxosatwar.messages.HMacVerifier.HMacVerifier ()`

5.148.3 Member Function Documentation

5.148.3.1 `void navigators.smart.paxosatwar.messages.HMacVerifier.authenticateAndEstablishAuthKey ()`

Initialises this verifier.

Implements [navigators.smart.paxosatwar.messages.MessageVerifier](#).

5.148.3.2 `byte [] navigators.smart.paxosatwar.messages.HMacVerifier.generateHash (List< byte[]> messageData)`

Generates the hash for the given message

Parameters

<i>messageData</i>	The data to hash
--------------------	------------------

Returns

The generated hash

Implements [navigators.smart.paxosatwar.messages.MessageVerifier](#).

5.148.3.3 `int navigators.smart.paxosatwar.messages.HMacVerifier.getHashSize ()`

Returns the size of the provided hashes

Returns

The hashsize

Implements [navigators.smart.paxosatwar.messages.MessageVerifier](#).

5.148.3.4 `byte [] navigators.smart.paxosatwar.messages.HMacVerifier.verifyHash (byte[] data, byte[] receivedHash)`

Verifies the given data with the given hash

Parameters

<i>data</i>	The data to check
<i>receivedHash</i>	The provided hash to compare to

Returns

true if the hash fits the data, false otherwise

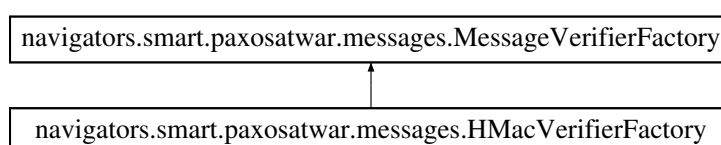
Implements [navigators.smart.paxosatwar.messages.MessageVerifier](#).

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

- modular-smart/src/navigators/smart/paxosatwar/messages/HMacVerifier.java

5.149 navigators.smart.paxosatwar.messages.HMacVerifierFactory Class Reference

Inheritance diagram for `navigators.smart.paxosatwar.messages.HMacVerifierFactory`:



Public Member Functions

- [MessageVerifier generateMessageVerifier](#) ()

5.149.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.149.2 Member Function Documentation

5.149.2.1 [MessageVerifier](#) navigators.smart.paxosatwar.messages.HMacVerifierFactory.generateMessageVerifier ()

Implements [navigators.smart.paxosatwar.messages.MessageVerifierFactory](#).

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

- modular-smart/src/navigators/smart/paxosatwar/messages/HMacVerifierFactory.java

5.150 navigators.smart.paxosatwar.messages.MessageFactory Class Reference

Public Member Functions

- [MessageFactory](#) (int from)
- [Propose createPropose](#) (long id, int round, byte[] value, [Proof](#) proof)
- [VoteMessage createWeak](#) (long id, int round, byte[] value)
- [VoteMessage createStrong](#) (long id, int round, byte[] value)
- [VoteMessage createDecide](#) (long id, int round, byte[] value)
- [PaxosMessage createFreeze](#) (long id, int round)
- [Collect createCollect](#) (long id, int round, [CollectProof](#) proof)

Static Public Attributes

- static final int [PROPOSE](#) = 44781
- static final int [WEAK](#) = 44782
- static final int [STRONG](#) = 44783
- static final int [DECIDE](#) = 44784
- static final int [FREEZE](#) = 44785
- static final int [COLLECT](#) = 44786

5.150.1 Detailed Description

This class work as a factory of messages used in the paxos protocol.

5.150.2 Constructor & Destructor Documentation

5.150.2.1 [navigators.smart.paxosatwar.messages.MessageFactory.MessageFactory](#) (int from)

Creates a message factory

Parameters

<i>from</i>	Replica ID of the process which sent this message
-------------	---

5.150.3 Member Function Documentation

5.150.3.1 **Collect** `navigators.smart.paxosatwar.messages.MessageFactory.createCollect (long id, int round, CollectProof proof)`

Creates a COLLECT message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>proof</i>	The proof to be sent by the leader for all replicas

Returns

A paxos message of the COLLECT type, with the specified id, round, and proof

5.150.3.2 **VoteMessage** `navigators.smart.paxosatwar.messages.MessageFactory.createDecide (long id, int round, byte[] value)`

Creates a DECIDE message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>value</i>	Decided value

Returns

A paxos message of the DECIDE type, with the specified id, round, and value

5.150.3.3 **PaxosMessage** `navigators.smart.paxosatwar.messages.MessageFactory.createFreeze (long id, int round)`

Creates a FREEZE message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number

Returns

A paxos message of the FREEZE type, with the specified id, and round

5.150.3.4 **Propose** `navigators.smart.paxosatwar.messages.MessageFactory.createPropose (long id, int round, byte[] value, Proof proof)`

Creates a PROPOSE message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>value</i>	Proposed value
<i>proof</i>	Proofs from other replicas

Returns

A paxos message of the PROPOSE type, with the specified id, round, value, and proof

5.150.3.5 **VoteMessage** navigators.smart.paxosatwar.messages.MessageFactory.createStrong (long *id*, int *round*, byte[] *value*)

Creates a STRONG message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>value</i>	Strongly accepted value

Returns

A paxos message of the STRONG type, with the specified id, round, and value

5.150.3.6 **VoteMessage** navigators.smart.paxosatwar.messages.MessageFactory.createWeak (long *id*, int *round*, byte[] *value*)

Creates a WEAK message to be sent by this process

Parameters

<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>value</i>	Weakly accepted value

Returns

A paxos message of the WEAK type, with the specified id, round, and value

5.150.4 Member Data Documentation

5.150.4.1 final int navigators.smart.paxosatwar.messages.MessageFactory.COLLECT = 44786 [static]

5.150.4.2 final int navigators.smart.paxosatwar.messages.MessageFactory.DECIDE = 44784 [static]

5.150.4.3 final int navigators.smart.paxosatwar.messages.MessageFactory.FREEZE = 44785 [static]

5.150.4.4 final int navigators.smart.paxosatwar.messages.MessageFactory.PROPOSE = 44781 [static]

5.150.4.5 final int navigators.smart.paxosatwar.messages.MessageFactory.STRONG = 44783 [static]

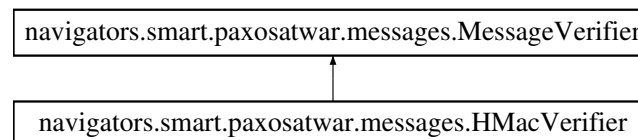
5.150.4.6 `final int navigators.smart.paxosatwar.messages.MessageFactory.WEAK = 44782` `[static]`

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

- `modular-smart/src/navigators/smart/paxosatwar/messages/MessageFactory.java`

5.151 `navigators.smart.paxosatwar.messages.MessageVerifier` Interface Reference

Inheritance diagram for `navigators.smart.paxosatwar.messages.MessageVerifier`:



Public Member Functions

- void [authenticateAndEstablishAuthKey](#) ()
- int [getHashSize](#) ()
- byte[] [verifyHash](#) (byte[] data, byte[] receivedHash)
- byte[] [generateHash](#) (List< byte[]> messageData)

5.151.1 Detailed Description

This Interface represents a messageverifier, that creates hashes for messages to send and verifies messages received. To represent the capabilities of a Unique Sequential Identifier Generator the result of a verification is not a boolean but an object containing the appended verification information.

Parameters

<A>	This is the Type of the objects returned when authenticating a message
-----	--

Author

Christian Spann <christian.spann@uni-ulm.de>

5.151.2 Member Function Documentation

5.151.2.1 void `navigators.smart.paxosatwar.messages.MessageVerifier.authenticateAndEstablishAuthKey` ()

Initialises this verifier.

Implemented in [navigators.smart.paxosatwar.messages.HMacVerifier](#).

5.151.2.2 byte [] `navigators.smart.paxosatwar.messages.MessageVerifier.generateHash` (List< byte[]> *messageData*)

Implemented in [navigators.smart.paxosatwar.messages.HMacVerifier](#).

5.151.2.3 int `navigators.smart.paxosatwar.messages.MessageVerifier.getHashSize` ()

Returns the size of the generated hashes by this verifier

Returns

Implemented in [navigators.smart.paxosatwar.messages.HMacVerifier](#).

5.151.2.4 `byte [] navigators.smart.paxosatwar.messages.MessageVerifier.verifyHash (byte[] data, byte[] receivedHash)`

Returns the decoded verification data if valid, null otherwise. With that Functionality it is possible to use e.g. the USIG mechanism in ebawa where monotonically rising numbers are generated.

Parameters

<i>data</i>	The data to check
<i>receivedHash</i>	The hash

Returns

The deserialised verification data if the data was valid

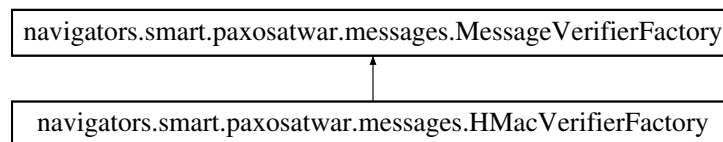
Implemented in [navigators.smart.paxosatwar.messages.HMacVerifier](#).

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

- modular-smart/src/navigators/smart/paxosatwar/messages/MessageVerifier.java

5.152 navigators.smart.paxosatwar.messages.MessageVerifierFactory Interface Reference

Inheritance diagram for navigators.smart.paxosatwar.messages.MessageVerifierFactory:



Public Member Functions

- [MessageVerifier generateMessageVerifier \(\)](#)

5.152.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.152.2 Member Function Documentation

5.152.2.1 `MessageVerifier navigators.smart.paxosatwar.messages.MessageVerifierFactory.generateMessageVerifier ()`

Implemented in [navigators.smart.paxosatwar.messages.HMacVerifierFactory](#).

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

- modular-smart/src/navigators/smart/paxosatwar/messages/MessageVerifierFactory.java

5.153 navigators.smart.paxosatwar.messages.PaWMessageHandler Class Reference

Public Member Functions

- [PaWMessageHandler](#) ([Acceptor](#) acc, [Proposer](#) prop, [RequestHandler](#) reqhandlr)
- void [setProposer](#) ([Proposer](#) proposer)
- void [setAcceptor](#) ([Acceptor](#) acceptor)
- void [processData](#) ([SmartMessage](#) sm)
- [PaxosMessage](#) [deserialise](#) (byte typeid, ByteBuffer buf) throws [ClassNotFoundException](#), [IOException](#)

5.153.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.153.2 Constructor & Destructor Documentation

- 5.153.2.1 [navigators.smart.paxosatwar.messages.PaWMessageHandler.PaWMessageHandler](#) ([Acceptor](#) acc, [Proposer](#) prop, [RequestHandler](#) reqhandlr)

5.153.3 Member Function Documentation

- 5.153.3.1 [PaxosMessage](#) [navigators.smart.paxosatwar.messages.PaWMessageHandler.deserialise](#) (byte typeid, ByteBuffer buf) throws [ClassNotFoundException](#), [IOException](#)

- 5.153.3.2 void [navigators.smart.paxosatwar.messages.PaWMessageHandler.processData](#) ([SmartMessage](#) sm)

- 5.153.3.3 void [navigators.smart.paxosatwar.messages.PaWMessageHandler.setAcceptor](#) ([Acceptor](#) acceptor)

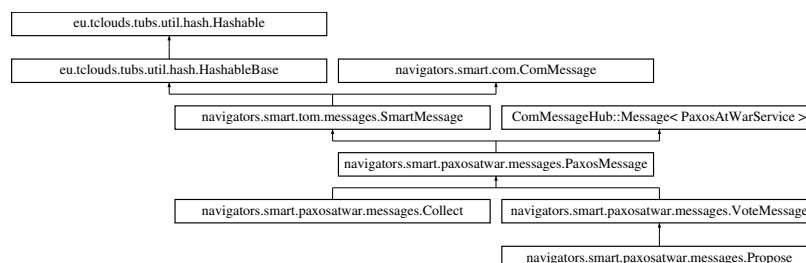
- 5.153.3.4 void [navigators.smart.paxosatwar.messages.PaWMessageHandler.setProposer](#) ([Proposer](#) proposer)

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

- modular-smart/src/navigators/smart/paxosatwar/messages/PaWMessageHandler.java

5.154 navigators.smart.paxosatwar.messages.PaxosMessage Class Reference

Inheritance diagram for [navigators.smart.paxosatwar.messages.PaxosMessage](#):



Public Member Functions

- [PaxosMessage](#) (ByteBuffer in)

- [PaxosMessage](#) (int paxosType, long id, int round, int from)
- void [process](#) ([PaxosAtWarService](#) service)
- int [getPayloadSize](#) ()
- int [getRound](#) ()
- long [getNumber](#) ()
- int [getPaxosType](#) ()
- String [getPaxosVerboseType](#) ()
- String [toString](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)

Static Public Member Functions

- static [PaxosMessage readFromBuffer](#) (int typeid, ByteBuffer buf)

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

5.154.1 Detailed Description

This class represents a message used in the paxos protocol.

5.154.2 Constructor & Destructor Documentation

5.154.2.1 navigators.smart.paxosatwar.messages.PaxosMessage.PaxosMessage (ByteBuffer in)

Creates a paxos message. Not used. TODO: Q tal meter isto como private?

Parameters

<i>in</i>	
-----------	--

Exceptions

<i>IOException</i>	
--------------------	--

5.154.2.2 navigators.smart.paxosatwar.messages.PaxosMessage.PaxosMessage (int paxosType, long id, int round, int from)

Parameters

<i>paxosType</i>	This should be MessageFactory.FREEYE
<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID

5.154.3 Member Function Documentation

5.154.3.1 boolean navigators.smart.paxosatwar.messages.PaxosMessage.equals (Object obj)

5.154.3.2 `long navigators.smart.paxosatwar.messages.PaxosMessage.getNumber ()`

Returns the consensus execution ID of this message

Returns

Consensus execution ID of this message

5.154.3.3 `int navigators.smart.paxosatwar.messages.PaxosMessage.getPaxosType ()`

Returns this message type

Returns

This message type

5.154.3.4 `String navigators.smart.paxosatwar.messages.PaxosMessage.getPaxosVerboseType ()`

Returns this message type as a verbose string

Returns

Message type

5.154.3.5 `int navigators.smart.paxosatwar.messages.PaxosMessage.getPayloadSize ()`

5.154.3.6 `int navigators.smart.paxosatwar.messages.PaxosMessage.getRound ()`

Retrieves the round number to which this message belongs

Returns

Round number to which this message belongs

5.154.3.7 `int navigators.smart.paxosatwar.messages.PaxosMessage.hashCode ()`

5.154.3.8 `void navigators.smart.paxosatwar.messages.PaxosMessage.process (PaxosAtWarService service)`

5.154.3.9 `static PaxosMessage navigators.smart.paxosatwar.messages.PaxosMessage.readFromBuffer (int typeid, ByteBuffer buf) [static]`

5.154.3.10 `String navigators.smart.paxosatwar.messages.PaxosMessage.toString ()`

5.154.3.11 `void navigators.smart.paxosatwar.messages.PaxosMessage.writePayloadTo (MessageSink sink) [protected]`

Creates a paxos message. Used by the message factory to create a WEAK, STRONG, or DECIDE message TODO: Q tal meter isto sem quantificador, para ser so visivel no mesmo package?

Parameters

<i>paxosType</i>	This should be MessageFactory.WEAK , MessageFactory.STRONG or MessageFactory.DECIDE
<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID
<i>value</i>	The value decided, or strongly/weakly accepted Creates a paxos message. Used by the message factory to create a FREEZE message TODO: Q tal meter isto sem quantificador, para ser so visivel no mesmo package?
<i>paxosType</i>	This should be MessageFactory.FREEZE
<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID

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

- modular-smart/src/navigators/smart/paxosatwar/messages/PaxosMessage.java

5.155 navigators.smart.paxosatwar.messages.PaxosMessageTest Class Reference

Public Member Functions

- void [testSerialiseFreeze](#) ()
- void [testSerialiseWeakStrongDecide](#) ()
- void [testSerialisePropose](#) ()
- void [testSerialiseCollectEmpty](#) ()
- void [testSerialiseCollectTestByte](#) ()

5.155.1 Member Function Documentation

5.155.1.1 void [navigators.smart.paxosatwar.messages.PaxosMessageTest.testSerialiseCollectEmpty](#) ()

5.155.1.2 void [navigators.smart.paxosatwar.messages.PaxosMessageTest.testSerialiseCollectTestByte](#) ()

5.155.1.3 void [navigators.smart.paxosatwar.messages.PaxosMessageTest.testSerialiseFreeze](#) ()

5.155.1.4 void [navigators.smart.paxosatwar.messages.PaxosMessageTest.testSerialisePropose](#) ()

5.155.1.5 void [navigators.smart.paxosatwar.messages.PaxosMessageTest.testSerialiseWeakStrongDecide](#) ()

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

- modular-smart/test/navigators/smart/paxosatwar/messages/PaxosMessageTest.java

5.156 navigators.smart.paxosatwar.messages.Proof Class Reference

Public Member Functions

- [Proof](#) ([CollectProof](#)[] proofs, byte[] nextPropose)
- [Proof](#) (ByteBuffer in)
- void [serialise](#) ([MessageSink](#) out)
- int [getMsgSize](#) ()
- byte[] [getNextPropose](#) ()
- [CollectProof](#)[] [getProofs](#) ()

5.156.1 Detailed Description

This class represents the proof used in the rounds freeze processing. The SignedObject contain the [CollectProof](#) for this server.

5.156.2 Constructor & Destructor Documentation

5.156.2.1 `navigators.smart.paxosatwar.messages.Proof.Proof (CollectProof[] proofs, byte[] nextPropose)`

Creates a new instance of [Proof](#)

Parameters

<i>proofs</i>	Signed proofs
<i>nextPropose</i>	Next value to be proposed

5.156.2.2 `navigators.smart.paxosatwar.messages.Proof.Proof (ByteBuffer in)`

5.156.3 Member Function Documentation

5.156.3.1 `int navigators.smart.paxosatwar.messages.Proof.getMsgSize ()`

5.156.3.2 `byte [] navigators.smart.paxosatwar.messages.Proof.getNextPropose ()`

Retrieves next value to be proposed

Returns

Next value to be proposed

5.156.3.3 `CollectProof [] navigators.smart.paxosatwar.messages.Proof.getProofs ()`

Retrieves the signed proofs

Returns

Signed proofs

5.156.3.4 `void navigators.smart.paxosatwar.messages.Proof.serialise (MessageSink out)`

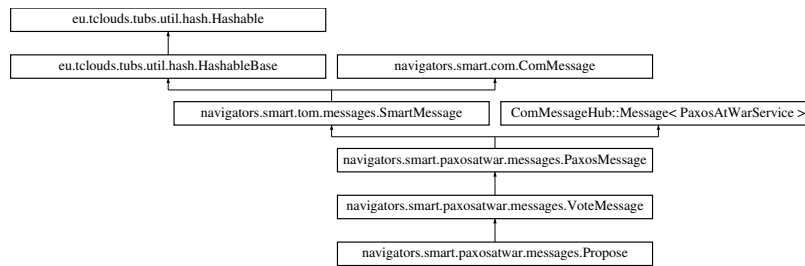
TODO this can be shrunken without tags if the length is sent

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

- modular-smart/src/navigators/smart/paxosatwar/messages/Proof.java

5.157 navigators.smart.paxosatwar.messages.Propose Class Reference

Inheritance diagram for navigators.smart.paxosatwar.messages.Propose:



Public Member Functions

- [Propose](#) (ByteBuffer in)
- [Propose](#) (long id, int round, int from, byte[] value, [Proof](#) proof)
- [Proof](#) [getProof](#) ()
- int [getPayloadSize](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

Additional Inherited Members

5.157.1 Detailed Description

Author

spann

5.157.2 Constructor & Destructor Documentation

5.157.2.1 `navigators.smart.paxosatwar.messages.Propose.Propose (ByteBuffer in)`

5.157.2.2 `navigators.smart.paxosatwar.messages.Propose.Propose (long id, int round, int from, byte[] value, Proof proof)`

Creates a PROPOSE message

Parameters

<i>paxosType</i>	This should be MessageFactory.COLLECT or MessageFactory.PROPOSE
<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID
<i>value</i>	The proposed value
<i>proof</i>	The proof to be sent by the leader for all replicas

5.157.3 Member Function Documentation

5.157.3.1 `boolean navigators.smart.paxosatwar.messages.Propose.equals (Object obj)`

5.157.3.2 `int navigators.smart.paxosatwar.messages.Propose.getPayloadSize ()`

5.157.3.3 Proof navigators.smart.paxosatwar.messages.Propose.getProof ()

Returns the proof associated with a PROPOSE or COLLECT message

Returns

The proof

5.157.3.4 int navigators.smart.paxosatwar.messages.Propose.hashCode ()

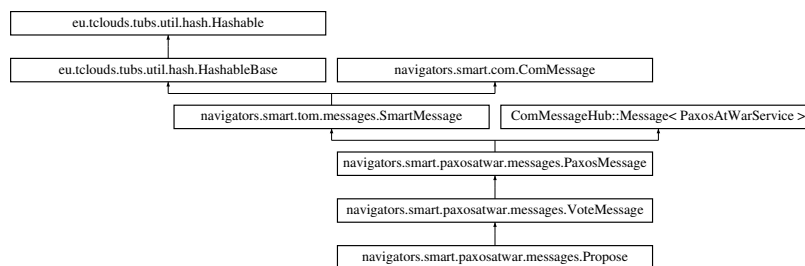
5.157.3.5 void navigators.smart.paxosatwar.messages.Propose.writePayloadTo (MessageSink sink) [protected]

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

- modular-smart/src/navigators/smart/paxosatwar/messages/Propose.java

5.158 navigators.smart.paxosatwar.messages.VoteMessage Class Reference

Inheritance diagram for navigators.smart.paxosatwar.messages.VoteMessage:



Public Member Functions

- [VoteMessage](#) (int paxosType, long id, int round, int from, byte[] [value](#))
- [VoteMessage](#) (ByteBuffer in)
- int [getPayloadSize](#) ()
- [VoteMessage](#) (int paxosType, long id, int round, int from)
- byte[] [getValue](#) ()
- int [hashCode](#) ()
- boolean [equals](#) (Object obj)

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

Protected Attributes

- byte[] [value](#)

Additional Inherited Members

5.158.1 Constructor & Destructor Documentation

5.158.1.1 `navigators.smart.paxosatwar.messages.VoteMessage.VoteMessage (int paxosType, long id, int round, int from, byte[] value)`

Creates a [VoteMessage](#) message

Parameters

<i>paxosType</i>	This should be MessageFactory.WEAK , <code>.STRONG</code> or <code>.DECIDE</code>
<i>id</i>	Consensus's execution ID
<i>round</i>	Round number
<i>from</i>	This should be this process ID
<i>value</i>	The proposed value

5.158.1.2 `navigators.smart.paxosatwar.messages.VoteMessage.VoteMessage (ByteBuffer in)`

5.158.1.3 `navigators.smart.paxosatwar.messages.VoteMessage.VoteMessage (int paxosType, long id, int round, int from)`

5.158.2 Member Function Documentation

5.158.2.1 `boolean navigators.smart.paxosatwar.messages.VoteMessage.equals (Object obj)`

5.158.2.2 `int navigators.smart.paxosatwar.messages.VoteMessage.getPayloadSize ()`

5.158.2.3 `byte [] navigators.smart.paxosatwar.messages.VoteMessage.getValue ()`

Retrieves the weakly accepted, strongly accepted, decided, or proposed value.

Returns

The value

5.158.2.4 `int navigators.smart.paxosatwar.messages.VoteMessage.hashCode ()`

5.158.2.5 `void navigators.smart.paxosatwar.messages.VoteMessage.writePayloadTo (MessageSink sink)`
`[protected]`

5.158.3 Member Data Documentation

5.158.3.1 `byte [] navigators.smart.paxosatwar.messages.VoteMessage.value` `[protected]`

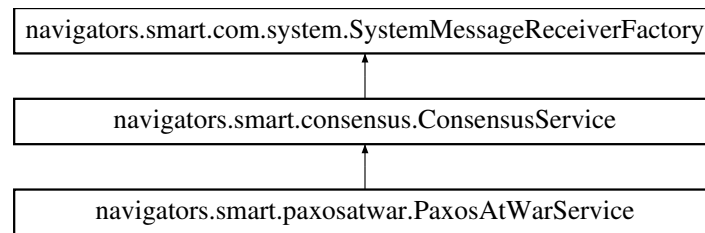
The value of this [Propose](#)

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

- modular-smart/src/navigators/smart/paxosatwar/messages/VoteMessage.java

5.159 navigators.smart.paxosatwar.PaxosAtWarService Class Reference

Inheritance diagram for navigators.smart.paxosatwar.PaxosAtWarService:



Public Member Functions

- [PaxosAtWarService](#) ([TOMLayer](#) tom)
- boolean [isProposer](#) ()
- void [decide](#) (int execlid, int batchsize, byte[] value)
- long [getLastExecuted](#) ()
- void [proposeRequests](#) ()
- void [requestDecided](#) ([TOMMessage](#) msg)
- [PaWMessageHandler](#) [getMessageHandler](#) ()
- int [getProcessID](#) ()
- String [toString](#) ()
- void [deliverState](#) ([TransferableState](#) state)
- int [getProposer](#) ([Consensus](#)<?> cons)
- void [startDeliverState](#) ()
- void [consensusDelivered](#) ([Consensus](#)<?> cons)
- void [start](#) ()
- byte[] [getState](#) ([Consensus](#)<?> cons)
- void [requestExecuted](#) ([ServiceResult](#) res)
- void [requestReplied](#) ([ServiceResult](#) res, [TOMMessage](#) reply, [MessageDigest](#) digest)
- int [numberOfActiveReplicas](#) ()
- int [numberOfFullReplies](#) ()
- [SystemMessageReceiver](#) [createServerMessageReceiver](#) (int remoteid)
- void [processStateManagementMessage](#) ([SMMessage](#) msg)
- void [processForwardedMessage](#) ([ForwardedMessage](#) msg)
- void [processTimeoutMessage](#) ([RTMessage](#) msg)
- void [processRecoveryMessage](#) ([RequestRecoveryMessage](#) msg)
- void [createCheckpoint](#) ([Consensus](#)<?> cons, [ServiceCheckpoint](#) scp)
- void [sendCheckpointRequest](#) ()

Public Attributes

- [RequestsTimer](#) [requestsTimer](#)

Static Public Attributes

- static final byte [MSGTYPEID_PAW](#) = 50

5.159.1 Constructor & Destructor Documentation

5.159.1.1 [navigators.smart.paxosatwar.PaxosAtWarService.PaxosAtWarService](#) ([TOMLayer](#) tom)

Creates a new PaxosAtWar instance with the given modules that handle several internal tasks

Parameters

<i>lm</i>	The LeaderManager
<i>manager</i>	The ExecutionManager
<i>msghandler</i>	The MessageHandler for PaxosAtWar Messages

5.159.2 Member Function Documentation

5.159.2.1 void navigators.smart.paxosatwar.PaxosAtWarService.consensusDelivered (Consensus<?> cons)

Called when the TOMLayer finished the delivery of the request and notified the consensuslayer of all the batched requests that where decided with this consensus.

Parameters

<i>cons</i>	The finished consensus.
-------------	-------------------------

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.2 void navigators.smart.paxosatwar.PaxosAtWarService.createCheckpoint (Consensus<?> cons, ServiceCheckpoint scp)

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.3 SystemMessageReceiver navigators.smart.paxosatwar.PaxosAtWarService.createServerMessageReceiver (int remoteid)

Implements [navigators.smart.com.system.SystemMessageReceiverFactory](#).

5.159.2.4 void navigators.smart.paxosatwar.PaxosAtWarService.decide (int execlid, int batchsize, byte[] value)

5.159.2.5 void navigators.smart.paxosatwar.PaxosAtWarService.deliverState (TransferableState state)

Notifies the service of a successful state transfer to indicate leaderchanges and so on. The decided requests need to be indicated seperately because the consensus doesn't know the internal structure of the batches and therefor cannot see which single requests where decided in the transferred state.

Parameters

<i>state</i>	
--------------	--

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.6 long navigators.smart.paxosatwar.PaxosAtWarService.getLastExecuted ()

5.159.2.7 PaWMessageHandler navigators.smart.paxosatwar.PaxosAtWarService.getMessageHandler ()

5.159.2.8 int navigators.smart.paxosatwar.PaxosAtWarService.getProcessID ()

Returns the id of this replicas consensus service

Returns

The consensuservice id

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.9 `int navigators.smart.paxosatwar.PaxosAtWarService.getProposer (Consensus<?> cons)`

Parameters

<code>cons</code>	The consensus of whom we wish to know the final proposer
-------------------	--

Returns

The id of the final proposer

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.10 `byte [] navigators.smart.paxosatwar.PaxosAtWarService.getState (Consensus<?> cons)`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.11 `boolean navigators.smart.paxosatwar.PaxosAtWarService.isProposer ()`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.12 `int navigators.smart.paxosatwar.PaxosAtWarService.numberOfActiveReplicas ()`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.13 `int navigators.smart.paxosatwar.PaxosAtWarService.numberOfFullReplies ()`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.14 `void navigators.smart.paxosatwar.PaxosAtWarService.processForwardedMessage (ForwardedMessage msg)`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.15 `void navigators.smart.paxosatwar.PaxosAtWarService.processRecoveryMessage (RequestRecoveryMessage msg)`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.16 `void navigators.smart.paxosatwar.PaxosAtWarService.processStateManagementMessage (SMMessage msg)`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.17 `void navigators.smart.paxosatwar.PaxosAtWarService.processTimeoutMessage (RTMessage msg)`

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.18 `void navigators.smart.paxosatwar.PaxosAtWarService.proposeRequests ()`

Returns the number of the last successfully decided round

Returns

The roundnumber of the last descision Notifies the service of a new request to be decided. This is needed to detect malicious leaders that do not propose messages from some clients.

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.19 void navigators.smart.paxosatwar.PaxosAtWarService.requestDecided (TOMMessage *msg*)

Notifies the service that the given request has been decided. This happens if we receive a state transfer

Parameters

<i>msg</i>	
------------	--

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.20 void navigators.smart.paxosatwar.PaxosAtWarService.requestExecuted (ServiceResult *res*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.21 void navigators.smart.paxosatwar.PaxosAtWarService.requestReplied (ServiceResult *res*, TOMMessage *reply*, MessageDigest *digest*)

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.22 void navigators.smart.paxosatwar.PaxosAtWarService.sendCheckpointRequest ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.23 void navigators.smart.paxosatwar.PaxosAtWarService.start ()

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.24 void navigators.smart.paxosatwar.PaxosAtWarService.startDeliverState ()

Indicates that the layer that uses the service starts to deliver a state

Implements [navigators.smart.consensus.ConsensusService](#).

5.159.2.25 String navigators.smart.paxosatwar.PaxosAtWarService.toString ()

5.159.3 Member Data Documentation

5.159.3.1 final byte navigators.smart.paxosatwar.PaxosAtWarService.MSGTYPEID_PAW = 50 [static]

5.159.3.2 RequestsTimer navigators.smart.paxosatwar.PaxosAtWarService.requestsTimer

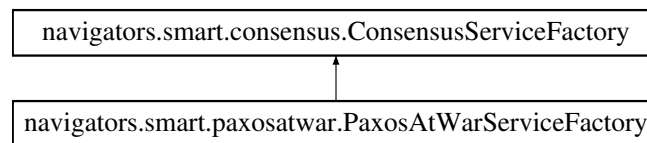
Manage timers for pending requests

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

- modular-smart/src/navigators/smart/paxosatwar/PaxosAtWarService.java

5.160 navigators.smart.paxosatwar.PaxosAtWarServiceFactory Class Reference

Inheritance diagram for navigators.smart.paxosatwar.PaxosAtWarServiceFactory:



Public Member Functions

- [ConsensusService newInstance](#) ([TOMLayer](#) tom)

5.160.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.160.2 Member Function Documentation

5.160.2.1 [ConsensusService](#) [navigators.smart.paxosatwar.PaxosAtWarServiceFactory.newInstance](#) ([TOMLayer](#) *tomlayer*)

Creates a new Instance of a [ConsensusService](#)

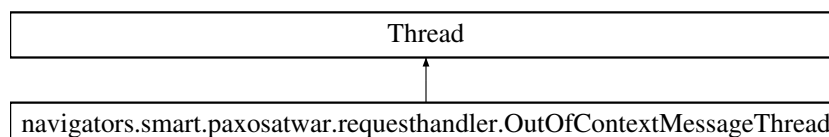
Implements [navigators.smart.consensus.ConsensusServiceFactory](#).

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

- modular-smart/src/navigators/smart/paxosatwar/PaxosAtWarServiceFactory.java

5.161 navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread Class Reference

Inheritance diagram for navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread:



Public Member Functions

- void [outOfContextLock](#) ()
- void [outOfContextUnlock](#) ()
- [OutOfContextMessageThread](#) ([ExecutionManager](#) *execmng*)
- void [run](#) ()

5.161.1 Detailed Description

This thread manages out of context messages

5.161.2 Constructor & Destructor Documentation

5.161.2.1 `navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread.OutOfContextMessageThread (ExecutionManager execmng)`

Creates a new instance of [OutOfContextMessageThread](#)

Parameters

<code>execmng</code>	The Executionmanager
----------------------	----------------------

5.161.3 Member Function Documentation

5.161.3.1 `void navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread.outOfContextLock ()`

5.161.3.2 `void navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread.outOfContextUnlock ()`

5.161.3.3 `void navigators.smart.paxosatwar.requesthandler.OutOfContextMessageThread.run ()`

This is the code for the thread. What it does, is wait for the PaW algorithm to finished. When it is finished, it forces the execution manager to process out of context message, by invoking the 'getExecution' method. It also ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

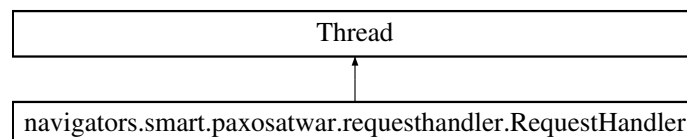
ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/OutOfContextMessageThread.java

5.162 navigators.smart.paxosatwar.requesthandler.RequestHandler Class Reference

Inheritance diagram for `navigators.smart.paxosatwar.requesthandler.RequestHandler`:



Public Member Functions

- [RequestHandler](#) (ComMessageHub< [PaxosAtWarService](#) > com, [ExecutionManager](#) execmng, [LeaderModule](#) lm, [ProofVerifier](#) a, [TOMConfiguration](#) conf, [TOMLayer](#) tom)
- `void imAmTheLeader ()`
- `void setLastExec (long last)`
- `long getLastExec ()`
- `void setInExec (long inEx)`
- `void waitForPaxosToFinish ()`

- long `getInExec ()`
- void `waitForLeader ()`
- void `run ()`
- boolean `requestTimeout (List< TOMMessage > requestList)`
- void `forwardRequestToLeader (TOMMessage request)`
- void `sendTimeoutMessage (List< byte[] > serializedRequestList)`
- void `sendCollectMessage (int reqId, RTCollect collect)`
- void `sendNewLeaderMessage (int reqId, RTLeaderChange rtLC)`
- void `deliverTimeoutRequest (RTMessage msg)`
- `RTInfo` `getTimeoutInfo (int reqId)`
- void `timeout (int acceptor, TOMMessage request, RTInfo rti)`
- void `collect (SignedObject c, int a, RTInfo rti)`
- void `setNoExec ()`
- void `notifyNewRequest ()`

5.162.1 Detailed Description

This class handles Requests

Author

Christian Spann <christian.spann at uni-ulm.de>

5.162.2 Constructor & Destructor Documentation

5.162.2.1 `navigators.smart.paxosatwar.requesthandler.RequestHandler.RequestHandler (ComMessageHub< PaxosAtWarService > com, ExecutionManager execmng, LeaderModule lm, ProofVerifier a, TOMConfiguration conf, TOMLayer tom)`

5.162.3 Member Function Documentation

5.162.3.1 `void navigators.smart.paxosatwar.requesthandler.RequestHandler.collect (SignedObject c, int a, RTInfo rti)`

Invoked by the TOM layer when a collect message is received, and to compute the necessary tasks

Parameters

<i>c</i>	Proof from the replica that sent the message
<i>a</i>	ID of the replica which sent the message

5.162.3.2 `void navigators.smart.paxosatwar.requesthandler.RequestHandler.deliverTimeoutRequest (RTMessage msg)`

This method is invoked when the communication system needs to deliver a message related to timeouts for a pending TOM message

Parameters

<i>msg</i>	The timeout related message being delivered
------------	---

5.162.3.3 `void navigators.smart.paxosatwar.requesthandler.RequestHandler.forwardRequestToLeader (TOMMessage request)`

5.162.3.4 long navigators.smart.paxosatwar.requesthandler.RequestHandler.getInExec ()

Gets the ID of the consensus currently beign executed

Returns

ID of the consensus currently beign executed (if no consensus ir executing, -1 is returned)

5.162.3.5 long navigators.smart.paxosatwar.requesthandler.RequestHandler.getLastExec ()

Gets the ID of the consensus which was established as the last executed

Returns

ID of the consensus which was established as the last executed

5.162.3.6 RTInfo navigators.smart.paxosatwar.requesthandler.RequestHandler.getTimeoutInfo (int reqId)

Retrieves the timeout information for a given timeout. If the timeout info does not exist, we create one.

Parameters

<i>reqId</i>	ID of the message which triggered the timeout
--------------	---

Returns

The timeout information

5.162.3.7 void navigators.smart.paxosatwar.requesthandler.RequestHandler.imAmTheLeader ()

5.162.3.8 void navigators.smart.paxosatwar.requesthandler.RequestHandler.notifyNewRequest ()

5.162.3.9 boolean navigators.smart.paxosatwar.requesthandler.RequestHandler.requestTimeout (List< TOMMessage > requestList)

Invoked when a timeout for a TOM message is triggered.

Parameters

<i>requestList</i>

Returns

True if the request is still pending and the timeout was not triggered before, false otherwise

5.162.3.10 void navigators.smart.paxosatwar.requesthandler.RequestHandler.run ()

This is the main code for this thread. It basically waits until this replica becomes the leader, and when so, proposes a value to the other acceptors

5.162.3.11 void navigators.smart.paxosatwar.requesthandler.RequestHandler.sendCollectMessage (int *reqId*, RTCollect *collect*)

Sends a RT-COLLECT message to other processes TODO: Se se o novo leader for este processo, nao e enviada nenhuma mensagem. Isto estara bem feito?

Parameters

<i>reqId</i>	ID of the message which triggered the timeout
<i>collect</i>	Proof for the timeout

5.162.3.12 void navigators.smart.paxosatwar.requesthandler.RequestHandler.sendNewLeaderMessage (int *reqId*, RTLeaderChange *rtLC*)

Sends a RT-LEADER message to other processes. It also updates the leader

Parameters

<i>reqId</i>	ID of the message which triggered the timeout
<i>timeout</i>	Timeout number
<i>rtLC</i>	Proofs for the leader change

5.162.3.13 void navigators.smart.paxosatwar.requesthandler.RequestHandler.sendTimeoutMessage (List< byte[][]> *serializedRequestList*)

Sends a RT-TIMEOUT message to other processes.

Parameters

<i>request</i>	the message that caused the timeout
----------------	-------------------------------------

5.162.3.14 void navigators.smart.paxosatwar.requesthandler.RequestHandler.setInExec (long *inEx*)

Sets which consensus is being executed at the moment. If the value is set to -1 a new Proposal is triggered if this replica is the leader.

Parameters

<i>inEx</i>	ID of the consensus being executed at the moment
-------------	--

5.162.3.15 void navigators.smart.paxosatwar.requesthandler.RequestHandler.setLastExec (long *last*)

Sets which consensus was the last to be executed

Parameters

<i>last</i>	ID of the consensus which was last to be executed
-------------	---

5.162.3.16 void navigators.smart.paxosatwar.requesthandler.RequestHandler.setNoExec ()

5.162.3.17 void navigators.smart.paxosatwar.requesthandler.RequestHandler.timeout (int *acceptor*, TOMMessage *request*, RTInfo *rti*)

Invoked by the TOM layer to notify that a timeout occurred in a replica, and to compute the necessary tasks

Parameters

<i>a</i>	Replica ID where this timeout occurred
<i>request</i>	the request that provoked the timeout
<i>rti</i>	the timeout info for this request

5.162.3.18 void navigators.smart.paxosatwar.requesthandler.RequestHandler.waitForLeader ()

5.162.3.19 void navigators.smart.paxosatwar.requesthandler.RequestHandler.waitForPaxosToFinish ()

This method blocks until the PaW algorithm is finished

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/RequestHandler.java

5.163 navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer Class Reference

Classes

- class [RequestTimerTask](#)

Public Member Functions

- [RequestsTimer](#) ([RequestHandler](#) reqhandler, long timeout)
- void [watch](#) (TOMMessage request)
- void [unwatch](#) (TOMMessage request)
- void [unwatchAll](#) ()

5.163.1 Detailed Description

This thread serves as a manager for all timers of pending requests.

5.163.2 Constructor & Destructor Documentation

5.163.2.1 navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.RequestsTimer ([RequestHandler](#) *reqhandler*, long *timeout*)

Creates a new instance of [RequestsTimer](#)

Parameters

<i>reqhandler</i>	The requesthandler that handles incoming requests
<i>timeout</i>	The timeout for requests to be delivered

5.163.3 Member Function Documentation

5.163.3.1 void navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.unwatch (TOMMessage request)

Cancels a timer for a given request

Parameters

<i>request</i>	Request whose timer is to be canceled
----------------	---------------------------------------

5.163.3.2 void navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.unwatchAll ()

Cancels all timers that are currently set

5.163.3.3 void navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.watch (TOMMessage request)

Creates a timer for the given request

Parameters

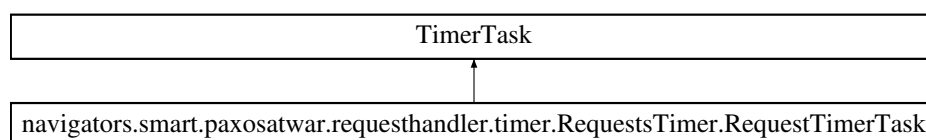
<i>request</i>	Request to which the timer is being created for
----------------	---

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/timer/RequestsTimer.java

5.164 navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.RequestTimerTask Class Reference

Inheritance diagram for navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.RequestTimerTask:



Public Member Functions

- void [run](#) ()

5.164.1 Member Function Documentation

5.164.1.1 void navigators.smart.paxosatwar.requesthandler.timer.RequestsTimer.RequestTimerTask.run ()

This is the code for the TimerTask. It executes the timeout for the first message on the watched list.

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/timer/RequestsTimer.java

5.165 navigators.smart.paxosatwar.requesthandler.timer.RTInfo Class Reference

Classes

- class [NextLeaderAndConsensusInfo](#)

Public Member Functions

- [RTInfo](#) ([TOMConfiguration](#) conf, int reqId)
- int [getRequestId](#) ()
- boolean [isNewLeaderSent](#) ()
- void [setCollect](#) (int a, [SignedObject](#) c)
- [SignedObject](#)[] [getCollect](#) ()
- void [setCollected](#) ()
- boolean [isCollected](#) ()
- boolean [isTimeout](#) (int a)
- void [setNewLeaderSent](#) ()
- void [setTimeout](#) (int a)
- [NextLeaderAndConsensusInfo](#) [getStartLeader](#) ([RTCollect](#)[] collect, int f)
- int [countTimeouts](#) ()
- int [countCollect](#) ()

5.165.1 Detailed Description

This class stores information about a timeout related to a request TODO: Julgo que esta classe tem/faz muita coisa que deveria estar no TOM layer

5.165.2 Constructor & Destructor Documentation

5.165.2.1 navigators.smart.paxosatwar.requesthandler.timer.RTInfo.RTInfo ([TOMConfiguration](#) conf, int reqId)

Creates a new instance of RequestTimeoutInfo

Parameters

<i>conf</i>	TOM configuration
<i>reqId</i>	ID of the request associated with this timer
<i>timeoutNum</i>	Number of the timeout
<i>tom</i>	TOM layer

5.165.3 Member Function Documentation

5.165.3.1 int navigators.smart.paxosatwar.requesthandler.timer.RTInfo.countCollect ()

Counts the ammount of collect proofs that are not null

Returns

The amount of collect proofs that are not null

5.165.3.2 int navigators.smart.paxosatwar.requesthandler.timer.RTInfo.countTimeouts ()

Retrieves the ammount of replicas where this timeout occurred

Returns

The ammount of replicas where this timeout occurred

5.165.3.3 SignedObject [] navigators.smart.paxosatwar.requesthandler.timer.RTInfo.getCollect ()

5.165.3.4 int navigators.smart.paxosatwar.requesthandler.timer.RTInfo.getRequestId ()

5.165.3.5 NextLeaderAndConsensusInfo navigators.smart.paxosatwar.requesthandler.timer.RTInfo.getStartLeader (RTCollect[] collect, int f)

Gets the new leader and consensus ID to be started after a TO-FREEZE fase is finished

Parameters

<i>collect</i>	Proofs from other replicas
<i>f</i>	Maximum number of faulty replicas that can exist

Returns

The replica ID of the new leader and the id of the next consensus to be executed

5.165.3.6 boolean navigators.smart.paxosatwar.requesthandler.timer.RTInfo.isCollected ()

5.165.3.7 boolean navigators.smart.paxosatwar.requesthandler.timer.RTInfo.isNewLeaderSent ()

5.165.3.8 boolean navigators.smart.paxosatwar.requesthandler.timer.RTInfo.isTimeout (int a)

Checks if this timeout occurred in the specified replica

Parameters

<i>a</i>	Replica id
----------	------------

Returns

True if this timer occurred in the specified replica, false otherwise

5.165.3.9 void navigators.smart.paxosatwar.requesthandler.timer.RTInfo.setCollect (int a, SignedObject c)

5.165.3.10 void navigators.smart.paxosatwar.requesthandler.timer.RTInfo.setCollected ()

5.165.3.11 void navigators.smart.paxosatwar.requesthandler.timer.RTInfo.setNewLeaderSent ()

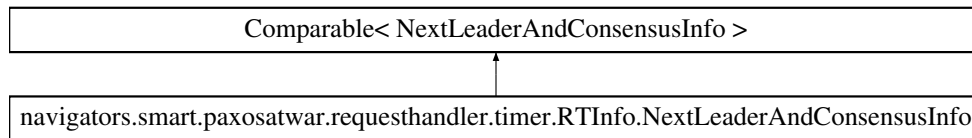
5.165.3.12 void navigators.smart.paxosatwar.requesthandler.timer.RTInfo.setTimeout (int a)

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/timer/RTInfo.java

5.166 navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo Class Reference

Inheritance diagram for navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo:



Public Member Functions

- [NextLeaderAndConsensusInfo](#) (long [cons](#), int [leader](#))
- int [compareTo](#) ([NextLeaderAndConsensusInfo](#) o)

Public Attributes

- long [cons](#)
- int [leader](#)

5.166.1 Constructor & Destructor Documentation

- 5.166.1.1 [navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo.NextLeaderAndConsensusInfo](#) (long *cons*, int *leader*)

5.166.2 Member Function Documentation

- 5.166.2.1 int [navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo.compareTo](#) ([NextLeaderAndConsensusInfo](#) o)

5.166.3 Member Data Documentation

- 5.166.3.1 long [navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo.cons](#)

- 5.166.3.2 int [navigators.smart.paxosatwar.requesthandler.timer.RTInfo.NextLeaderAndConsensusInfo.leader](#)

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

- modular-smart/src/navigators/smart/paxosatwar/requesthandler/timer/RTInfo.java

5.167 navigators.smart.paxosatwar.roles.Acceptor Class Reference

Public Member Functions

- [Acceptor](#) (ComMessageHub< [PaxosAtWarService](#) > communication, [MessageFactory](#) factory, [ProofVerifier](#) verifier, [LeaderModule](#) lm, [TOMConfiguration](#) conf, [TOMLayer](#) layer)
- SignedObject [sign](#) ([RTCollect](#) rtc)
- void [setManager](#) ([ExecutionManager](#) manager)
- void [setRequesthandler](#) ([RequestHandler](#) tom)
- final void [deliver](#) ([PaxosMessage](#) msg)

- void [processMessage](#) ([PaxosMessage](#) msg)
- void [proposeReceived](#) ([Round](#) round, [Propose](#) msg)
- boolean [executeAcceptedPendent](#) (long eid)
- void [scheduleTimeout](#) ([Round](#) round)
- void [timeout](#) ([Round](#) round)

5.167.1 Detailed Description

This class represents the acceptor role in the paxos protocol. This class work together with the TOMulticastLayer class in order to supply a atomic multicast service.

5.167.2 Constructor & Destructor Documentation

5.167.2.1 `navigators.smart.paxosatwar.roles.Acceptor.Acceptor (ComMessageHub< PaxosAtWarService > communication, MessageFactory factory, ProofVerifier verifier, LeaderModule lm, TOMConfiguration conf, TOMLayer layer)`

Creates a new instance of [Acceptor](#).

Parameters

<i>communication</i>	Replicas communication system
<i>factory</i>	Message factory for PaW messages
<i>verifier</i>	Proof verifier
<i>conf</i>	TOM configuration

5.167.3 Member Function Documentation

5.167.3.1 `final void navigators.smart.paxosatwar.roles.Acceptor.deliver (PaxosMessage msg)`

Called by communication layer to delivery paxos messages. This method only verifies if the message can be executed and calls process message (storing it on an out of context message buffer if this is not the case)

Parameters

<i>msg</i>	Paxos messages delivered by the comunication layer
------------	--

5.167.3.2 `boolean navigators.smart.paxosatwar.roles.Acceptor.executeAcceptedPendent (long eid)`

Called by the delivery thread. Executes the next accepted propose.

Parameters

<i>eid</i>	Consensus's execution ID
------------	--------------------------

Returns

True if there is a next value to be proposed and it belongs to the specified execution, false otherwise

5.167.3.3 `void navigators.smart.paxosatwar.roles.Acceptor.processMessage (PaxosMessage msg)`

Called when a paxos message is received or when a out of context message must be processed. It processes the received message acording to its type

Parameters

<i>msg</i>	The message to be processed
------------	-----------------------------

5.167.3.4 void navigators.smart.paxosatwar.roles.Acceptor.proposeReceived (Round *round*, Propose *msg*)

Called when a PROPOSE message is received or when processing a formerly out of context propose which is know belongs to the current execution.

Parameters

<i>msg</i>	The PROPOSE message to by processed
------------	-------------------------------------

5.167.3.5 void navigators.smart.paxosatwar.roles.Acceptor.scheduleTimeout (Round *round*)

Schedules a timeout for a given round. It is called by an Execution when a new round is created.

Parameters

<i>round</i>	Round to be associated with the timeout
--------------	---

5.167.3.6 void navigators.smart.paxosatwar.roles.Acceptor.setManager (ExecutionManager *manager*)

Sets the execution manager for this acceptor

Parameters

<i>manager</i>	Execution manager for this acceptor
----------------	-------------------------------------

5.167.3.7 void navigators.smart.paxosatwar.roles.Acceptor.setRequesthandler (RequestHandler *tom*)

Sets the TOM layer for this acceptor

Parameters

<i>tom</i>	TOM layer for this acceptor
------------	-----------------------------

5.167.3.8 SignedObject navigators.smart.paxosatwar.roles.Acceptor.sign (RTCollect *rtc*)

Verifies the signature of a signed object

Parameters

<i>so</i>	Signed object to be verified
<i>sender</i>	Replica id that supposably signed this object

Returns

True if the signature is valid, false otherwise Makes a RTCollect object with this process private key

Parameters

<i>rtc</i>	RTCollect object to be signed
------------	-------------------------------

Returns

A SignedObject containing 'rtc'

5.167.3.9 void navigators.smart.paxosatwar.roles.Acceptor.timeout (Round *round*)

This mehod is called by timertasks associated with rounds. It will locally freeze a round, given that is not already frozen, its not decided, and is not removed from its execution

Parameters

<i>round</i>	
--------------	--

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

- modular-smart/src/navigators/smart/paxosatwar/roles/Acceptor.java

5.168 navigators.smart.paxosatwar.roles.Proposer Class Reference

Public Member Functions

- [Proposer](#) (ComMessageHub< [PaxosAtWarService](#) > communication, [MessageFactory](#) factory, [ProofVerifier](#) verifier, [TOMConfiguration](#) conf)
- void [setManager](#) ([ExecutionManager](#) manager)
- void [startExecution](#) (long eid, byte[] value)
- void [deliver](#) ([Collect](#) msg)

5.168.1 Detailed Description

This class represents the proposer role in the paxos protocol.

5.168.2 Constructor & Destructor Documentation

5.168.2.1 navigators.smart.paxosatwar.roles.Proposer.Proposer (ComMessageHub< [PaxosAtWarService](#) > *communication*, [MessageFactory](#) *factory*, [ProofVerifier](#) *verifier*, [TOMConfiguration](#) *conf*)

Creates a new instance of [Proposer](#)

Parameters

<i>communication</i>	Replicas comunication system
<i>factory</i>	Factory for PaW messages
<i>verifier</i>	Proof verifier
<i>conf</i>	TOM configuration

5.168.3 Member Function Documentation

5.168.3.1 void navigators.smart.paxosatwar.roles.Proposer.deliver ([Collect](#) *msg*)

This method only deals with COLLECT messages.

Parameters

<i>msg</i>	the COLLECT message received
------------	------------------------------

5.168.3.2 void navigators.smart.paxosatwar.roles.Proposer.setManager (ExecutionManager *manager*)

Sets the execution manager associated with this proposer

Parameters

<i>manager</i>	Execution manager
----------------	-------------------

5.168.3.3 void navigators.smart.paxosatwar.roles.Proposer.startExecution (long *eid*, byte[] *value*)

This method is called by the TOMLayer (or any other) to start the execution of one instance of the paxos protocol.

Parameters

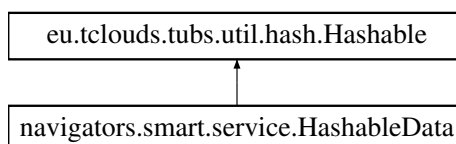
<i>eid</i>	ID for the consensus's execution to be started
<i>value</i>	Value to be proposed

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

- modular-smart/src/navigators/smart/paxosatwar/roles/Proposer.java

5.169 navigators.smart.service.HashableData Interface Reference

Inheritance diagram for navigators.smart.service.HashableData:



Public Member Functions

- void [writeDataTo](#) ([MessageSink](#) out)
- int [getDataSize](#) ()

5.169.1 Member Function Documentation

5.169.1.1 int navigators.smart.service.HashableData.getDataSize ()

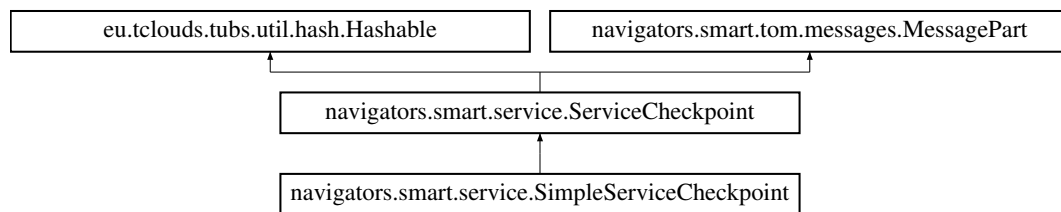
5.169.1.2 void navigators.smart.service.HashableData.writeDataTo (MessageSink out)

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

- modular-smart/src/navigators/smart/service/HashableData.java

5.170 navigators.smart.service.ServiceCheckpoint Interface Reference

Inheritance diagram for navigators.smart.service.ServiceCheckpoint:



Public Member Functions

- boolean [matches](#) ([ServiceCheckpoint](#) other)

5.170.1 Member Function Documentation

5.170.1.1 boolean [navigators.smart.service.ServiceCheckpoint.matches](#) ([ServiceCheckpoint](#) other)

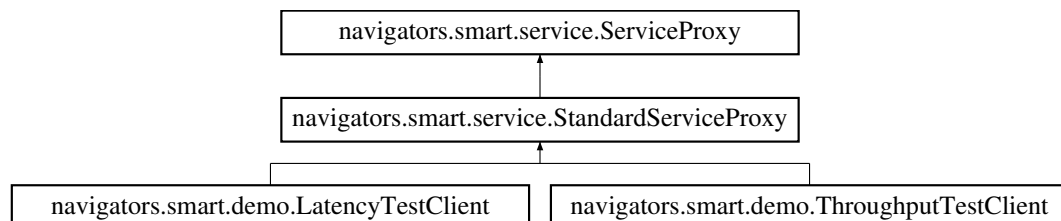
Implemented in [navigators.smart.service.SimpleServiceCheckpoint](#).

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

- modular-smart/src/navigators/smart/service/ServiceCheckpoint.java

5.171 navigators.smart.service.ServiceProxy Interface Reference

Inheritance diagram for navigators.smart.service.ServiceProxy:



Public Member Functions

- void [start](#) () throws IOException
- void [shutdown](#) ()
- int [getProcessID](#) ()

5.171.1 Member Function Documentation

5.171.1.1 int [navigators.smart.service.ServiceProxy.getProcessID](#) ()

Implemented in [navigators.smart.service.StandardServiceProxy](#).

5.171.1.2 void `navigators.smart.service.ServiceProxy.shutdown ()`

Implemented in [navigators.smart.service.StandardServiceProxy](#).

5.171.1.3 void `navigators.smart.service.ServiceProxy.start ()` throws `IOException`

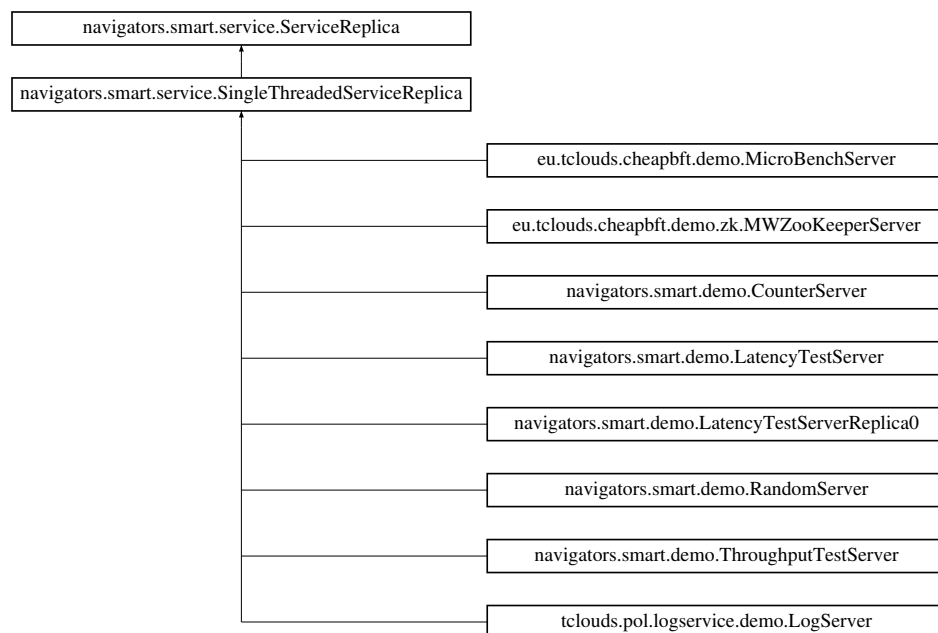
Implemented in [navigators.smart.service.StandardServiceProxy](#).

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

- modular-smart/src/navigators/smart/service/ServiceProxy.java

5.172 navigators.smart.service.ServiceReplica Interface Reference

Inheritance diagram for `navigators.smart.service.ServiceReplica`:



Public Member Functions

- void [start \(\)](#) throws `IOException`, `InterruptedException`
- void [shutdown \(\)](#)
- void [receiveActivate \(\)](#) throws `InterruptedException`
- void [receivePassivate \(\)](#) throws `InterruptedException`
- void [receiveServiceRequest \(TOMMessage msg\)](#) throws `InterruptedException`
- void [receiveUpdate \(ServiceStateUpdate update\)](#) throws `InterruptedException`
- void [receiveCheckpointRequest \(Consensus<?> cons\)](#) throws `InterruptedException`
- void [receiveCheckpoint \(ServiceCheckpoint cp\)](#) throws `InterruptedException`
- [ServiceReply readReplyFrom \(ByteBuffer in\)](#)
- [ServiceStateUpdate readStateUpdateFrom \(ByteBuffer in\)](#)
- [ServiceCheckpoint readCheckpointFrom \(ByteBuffer in\)](#)
- int [getProcessID \(\)](#)
- void [waitForEmptyQueue \(\)](#)
- [ServiceCheckpoint createCheckpointObs \(\)](#)

5.172.1 Member Function Documentation

5.172.1.1 ServiceCheckpoint navigators.smart.service.ServiceReplica.createCheckpointObs ()

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.LatencyTestServerReplica0](#), and [navigators.smart.demo.LatencyTestServer](#).

5.172.1.2 int navigators.smart.service.ServiceReplica.getProcessID ()

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.3 ServiceCheckpoint navigators.smart.service.ServiceReplica.readCheckpointFrom (ByteBuffer in)

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.4 ServiceReply navigators.smart.service.ServiceReplica.readReplyFrom (ByteBuffer in)

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.5 ServiceStateUpdate navigators.smart.service.ServiceReplica.readStateUpdateFrom (ByteBuffer in)

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.6 void navigators.smart.service.ServiceReplica.receiveActivate () throws InterruptedException

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.7 void navigators.smart.service.ServiceReplica.receiveCheckpoint (ServiceCheckpoint cp) throws InterruptedException

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.LatencyTestServerReplica0](#), and [navigators.smart.demo.LatencyTestServer](#).

5.172.1.8 void navigators.smart.service.ServiceReplica.receiveCheckpointRequest (Consensus<?> cons) throws InterruptedException

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.9 void navigators.smart.service.ServiceReplica.receivePassivate () throws InterruptedException

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#).

5.172.1.10 void navigators.smart.service.ServiceReplica.receiveServiceRequest (TOMMessage msg) throws InterruptedException

Implemented in [navigators.smart.service.SingleThreadedServiceReplica](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.LatencyTestServerReplica0](#), and [navigators.smart.demo.LatencyTestServer](#).

5.172.1.11 void `navigators.smart.service.ServiceReply.receiveUpdate (ServiceStateUpdate update)` throws `InterruptedException`

Implemented in [navigators.smart.service.SingleThreadedServiceReply](#).

5.172.1.12 void `navigators.smart.service.ServiceReply.shutdown ()`

Implemented in [tclouds.pol.logservice.demo.LogServer](#), and [navigators.smart.service.SingleThreadedServiceReply](#).

5.172.1.13 void `navigators.smart.service.ServiceReply.start ()` throws `IOException`, `InterruptedException`

Implemented in [tclouds.pol.logservice.demo.LogServer](#), [eu.tclouds.cheapbft.demo.MicroBenchServer](#), and [navigators.smart.service.SingleThreadedServiceReply](#).

5.172.1.14 void `navigators.smart.service.ServiceReply.waitForEmptyQueue ()`

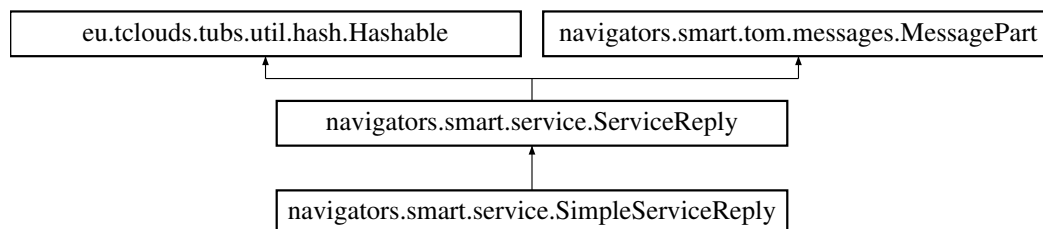
Implemented in [navigators.smart.service.SingleThreadedServiceReply](#).

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

- `modular-smart/src/navigators/smart/service/ServiceReply.java`

5.173 navigators.smart.service.ServiceReply Interface Reference

Inheritance diagram for `navigators.smart.service.ServiceReply`:



Public Member Functions

- boolean `matches (ServiceReply other)`

5.173.1 Member Function Documentation

5.173.1.1 boolean `navigators.smart.service.ServiceReply.matches (ServiceReply other)`

Implemented in [navigators.smart.service.SimpleServiceReply](#).

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

- `modular-smart/src/navigators/smart/service/ServiceReply.java`

5.174 navigators.smart.service.ServiceRequest Interface Reference

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

- modular-smart/src/navigators/smart/service/ServiceRequest.java

5.175 navigators.smart.service.ServiceResult Class Reference

Public Member Functions

- [ServiceResult](#) ([ServiceReply](#) reply, [ServiceStateUpdate](#) update)
- [ServiceReply](#) getReply ()
- [ServiceStateUpdate](#) getUpdate ()
- void [initRequest](#) (int execno, int updno, [TOMMessage](#) request)
- int [getExecutionNumber](#) ()
- int [getUpdateNumber](#) ()
- [TOMMessage](#) getRequest ()
- boolean [isEmpty](#) ()

Static Public Member Functions

- static [ServiceResult](#) [getEmpty](#) ()

5.175.1 Constructor & Destructor Documentation

5.175.1.1 `navigators.smart.service.ServiceResult.ServiceResult (ServiceReply reply, ServiceStateUpdate update)`

5.175.2 Member Function Documentation

5.175.2.1 `static ServiceResult navigators.smart.service.ServiceResult.getEmpty ()` [*static*]

5.175.2.2 `int navigators.smart.service.ServiceResult.getExecutionNumber ()`

5.175.2.3 `ServiceReply navigators.smart.service.ServiceResult.getReply ()`

5.175.2.4 `TOMMessage navigators.smart.service.ServiceResult.getRequest ()`

5.175.2.5 `ServiceStateUpdate navigators.smart.service.ServiceResult.getUpdate ()`

5.175.2.6 `int navigators.smart.service.ServiceResult.getUpdateNumber ()`

5.175.2.7 `void navigators.smart.service.ServiceResult.initRequest (int execno, int updno, TOMMessage request)`

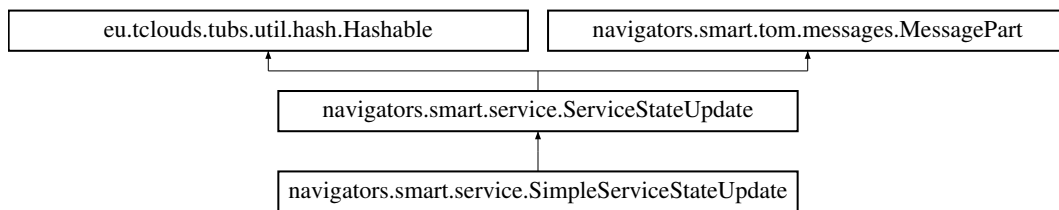
5.175.2.8 `boolean navigators.smart.service.ServiceResult.isEmpty ()`

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

- modular-smart/src/navigators/smart/service/ServiceResult.java

5.176 navigators.smart.service.ServiceStateUpdate Interface Reference

Inheritance diagram for navigators.smart.service.ServiceStateUpdate:



Public Member Functions

- boolean [matches](#) ([ServiceStateUpdate](#) other)

5.176.1 Member Function Documentation

5.176.1.1 boolean navigators.smart.service.ServiceStateUpdate.matches ([ServiceStateUpdate](#) other)

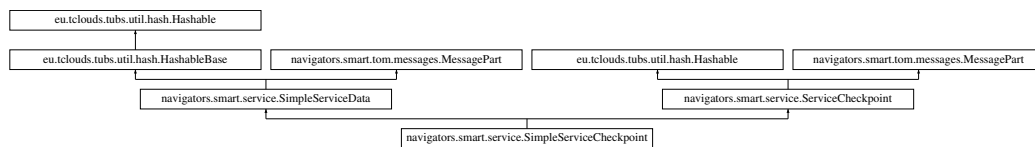
Implemented in [navigators.smart.service.SimpleServiceStateUpdate](#).

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

- modular-smart/src/navigators/smart/service/ServiceStateUpdate.java

5.177 navigators.smart.service.SimpleServiceCheckpoint Class Reference

Inheritance diagram for navigators.smart.service.SimpleServiceCheckpoint:



Public Member Functions

- [SimpleServiceCheckpoint](#) (byte[] data, byte[] hash)
- boolean [matches](#) ([ServiceCheckpoint](#) other)
- String [toString](#) ()

Static Public Member Functions

- static [ServiceCheckpoint](#) [readFrom](#) (ByteBuffer in)

Additional Inherited Members

5.177.1 Constructor & Destructor Documentation

5.177.1.1 navigators.smart.service.SimpleServiceCheckpoint.SimpleServiceCheckpoint (byte[] data, byte[] hash)

5.177.2 Member Function Documentation

5.177.2.1 `boolean navigators.smart.service.SimpleServiceCheckpoint.matches (ServiceCheckpoint other)`

Implements [navigators.smart.service.ServiceCheckpoint](#).

5.177.2.2 `static ServiceCheckpoint navigators.smart.service.SimpleServiceCheckpoint.readFrom (ByteBuffer in)`
[static]

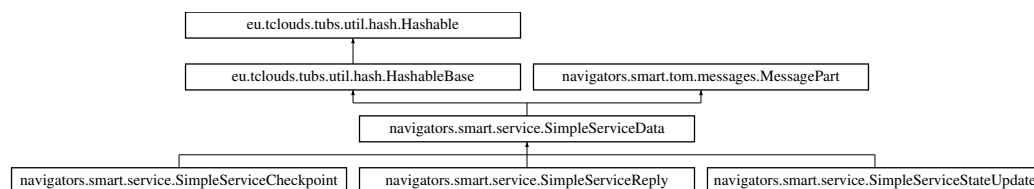
5.177.2.3 `String navigators.smart.service.SimpleServiceCheckpoint.toString ()`

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

- modular-smart/src/navigators/smart/service/SimpleServiceCheckpoint.java

5.178 navigators.smart.service.SimpleServiceData Class Reference

Inheritance diagram for `navigators.smart.service.SimpleServiceData`:



Public Member Functions

- [SimpleServiceData](#) (byte[] data)
- void [initHashTasks](#) (HasherPool< [Hashable](#) > hasherpool)
- [MessageSink](#) [writeTo](#) ([MessageSink](#) sink)
- [ExtMessageDigest](#) [updateHash](#) ([ExtMessageDigest](#) digest)
- byte[] [getData](#) ()
- int [getSize](#) ()

Protected Member Functions

- byte[] [doCalcHash](#) ([MessageDigest](#) digest)
- boolean [matches](#) ([SimpleServiceData](#) other)

Static Protected Member Functions

- static byte[] [readDataFrom](#) (ByteBuffer in)

5.178.1 Constructor & Destructor Documentation

5.178.1.1 `navigators.smart.service.SimpleServiceData.SimpleServiceData (byte[] data)`

5.178.2 Member Function Documentation

Additional Inherited Members

5.179.1 Constructor & Destructor Documentation

5.179.1.1 `navigators.smart.service.SimpleServiceReply.SimpleServiceReply (byte[] data)`

5.179.2 Member Function Documentation

5.179.2.1 `boolean navigators.smart.service.SimpleServiceReply.matches (ServiceReply other)`

Implements [navigators.smart.service.ServiceReply](#).

5.179.2.2 `static SimpleServiceReply navigators.smart.service.SimpleServiceReply.readFrom (ByteBuffer in)`
[static]

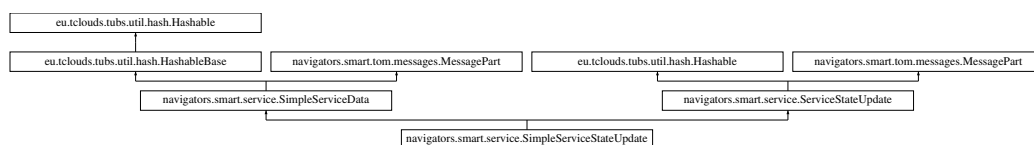
5.179.2.3 `String navigators.smart.service.SimpleServiceReply.toString ()`

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

- modular-smart/src/navigators/smart/service/SimpleServiceReply.java

5.180 navigators.smart.service.SimpleServiceStateUpdate Class Reference

Inheritance diagram for `navigators.smart.service.SimpleServiceStateUpdate`:



Public Member Functions

- [SimpleServiceStateUpdate](#) (byte[] data)
- `boolean matches (ServiceStateUpdate other)`
- `String toString ()`

Static Public Member Functions

- `static SimpleServiceStateUpdate readFrom (ByteBuffer in)`

Additional Inherited Members

5.180.1 Constructor & Destructor Documentation

5.180.1.1 `navigators.smart.service.SimpleServiceStateUpdate.SimpleServiceStateUpdate (byte[] data)`

5.180.2 Member Function Documentation

5.180.2.1 `boolean navigators.smart.service.SimpleServiceStateUpdate.matches (ServiceStateUpdate other)`

Implements [navigators.smart.service.ServiceStateUpdate](#).

5.180.2.2 `static SimpleServiceStateUpdate navigators.smart.service.SimpleServiceStateUpdate.readFrom (ByteBuffer in) [static]`

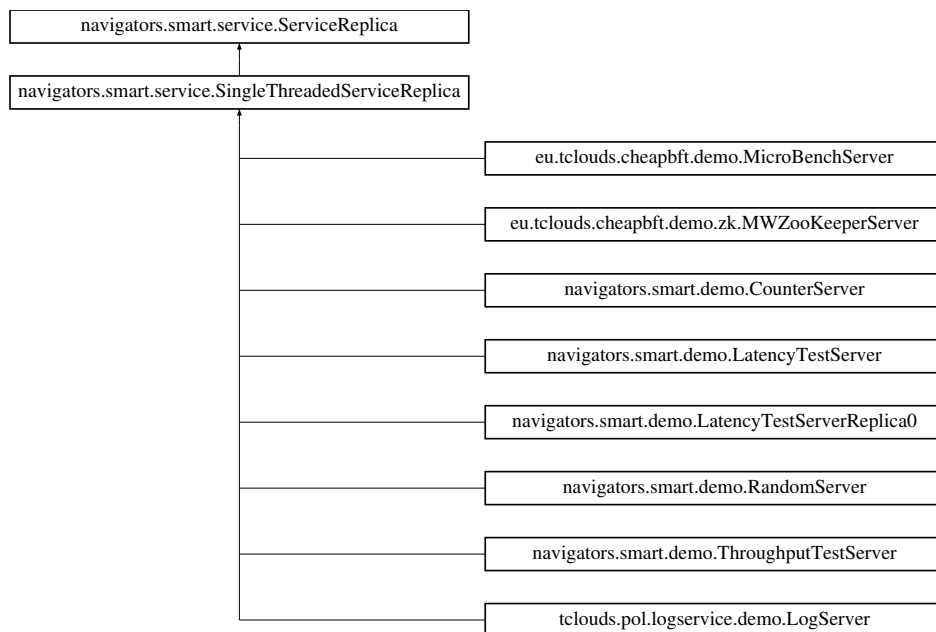
5.180.2.3 `String navigators.smart.service.SimpleServiceStateUpdate.toString ()`

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

- modular-smart/src/navigators/smart/service/SimpleServiceStateUpdate.java

5.181 navigators.smart.service.SingleThreadedServiceReplica Class Reference

Inheritance diagram for navigators.smart.service.SingleThreadedServiceReplica:



Public Member Functions

- [SingleThreadedServiceReplica](#) (int procid) throws ConfigurationException
- void [start](#) () throws IOException, InterruptedException
- void [shutdown](#) ()
- void [receiveActivate](#) () throws InterruptedException
- void [receivePassivate](#) () throws InterruptedException
- void [receiveServiceRequest](#) (TOMMessage msg) throws InterruptedException
- void [receiveUpdate](#) (ServiceStateUpdate update) throws InterruptedException
- void [receiveCheckpointRequest](#) (Consensus<?> cons) throws InterruptedException
- void [receiveCheckpoint](#) (ServiceCheckpoint cp) throws InterruptedException
- [ServiceStateUpdate](#) [readStateUpdateFrom](#) (ByteBuffer in)
- [ServiceReply](#) [readReplyFrom](#) (ByteBuffer in)
- [ServiceCheckpoint](#) [readCheckpointFrom](#) (ByteBuffer in)
- long [readoutPerformanceCounters](#) (MeasurementResult pcexccmds)
- int [getProcessID](#) ()
- [ServiceCheckpoint](#) [createCheckpointObs](#) ()
- void [waitForEmptyQueue](#) ()

Protected Member Functions

- void [activate](#) ()
- void [passivate](#) ()
- [TOMLayer](#) [getTOMLayer](#) ()
- abstract [ServiceResult](#) [executeCommand](#) (int *clientId*, long *timestamp*, byte[] *nonces*, byte[] *command*, [DebugInfo](#) *info*)
- abstract void [applyUpdate](#) ([ServiceStateUpdate](#) *update*)
- abstract [ServiceCheckpoint](#) [createCheckpoint](#) ()
- abstract void [loadCheckpoint](#) ([ServiceCheckpoint](#) *cp*)

Protected Attributes

- ReentrantLock [durationLock](#) = new ReentrantLock()

5.181.1 Constructor & Destructor Documentation

- 5.181.1.1 [navigators.smart.service.SingleThreadedServiceReplica](#).[SingleThreadedServiceReplica](#) (int *procid*) throws [ConfigurationException](#)

5.181.2 Member Function Documentation

- 5.181.2.1 void [navigators.smart.service.SingleThreadedServiceReplica](#).[activate](#) () [protected]

- 5.181.2.2 abstract void [navigators.smart.service.SingleThreadedServiceReplica](#).[applyUpdate](#) ([ServiceStateUpdate](#) *update*) [protected],[pure virtual]

Implemented in [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer](#), [tclouds.pol.logservice.demo.LogServer](#), [navigators.smart.demo.CounterServer](#), [navigators.smart.demo.RandomServer](#), [eu.tclouds.cheapbft.demo.MicroBenchServer](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.LatencyTestServer](#), and [navigators.smart.demo.LatencyTestServerReplica0](#).

- 5.181.2.3 abstract [ServiceCheckpoint](#) [navigators.smart.service.SingleThreadedServiceReplica](#).[createCheckpoint](#) () [protected],[pure virtual]

Implemented in [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer](#), [tclouds.pol.logservice.demo.LogServer](#), [navigators.smart.demo.CounterServer](#), [eu.tclouds.cheapbft.demo.MicroBenchServer](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.RandomServer](#), [navigators.smart.demo.LatencyTestServer](#), and [navigators.smart.demo.LatencyTestServerReplica0](#).

- 5.181.2.4 [ServiceCheckpoint](#) [navigators.smart.service.SingleThreadedServiceReplica](#).[createCheckpointObs](#) ()

Implements [navigators.smart.service.ServiceReplica](#).

- 5.181.2.5 abstract [ServiceResult](#) [navigators.smart.service.SingleThreadedServiceReplica](#).[executeCommand](#) (int *clientId*, long *timestamp*, byte[] *nonces*, byte[] *command*, [DebugInfo](#) *info*) [protected],[pure virtual]

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generate its own random values. This is important because these values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implemented in [tclouds.pol.logservice.demo.LogServer](#), [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer](#), [navigators.smart.demo.ThroughputTestServer](#), [eu.tclouds.cheapbft.demo.MicroBenchServer](#), [navigators.smart.demo.LatencyTestServerReplica0](#), [navigators.smart.demo.LatencyTestServer](#), [navigators.smart.demo.CounterServer](#), and [navigators.smart.demo.RandomServer](#).

5.181.2.6 `int navigators.smart.service.SingleThreadedServiceReplica.getProcessID ()`

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.7 `TOMLayer navigators.smart.service.SingleThreadedServiceReplica.getTOMLayer ()` [protected]

5.181.2.8 `abstract void navigators.smart.service.SingleThreadedServiceReplica.loadCheckpoint (ServiceCheckpoint cp)`
[protected], [pure virtual]

Implemented in [eu.tclouds.cheapbft.demo.zk.MWZooKeeperServer](#), [tclouds.pol.logservice.demo.LogServer](#), [navigators.smart.demo.CounterServer](#), [eu.tclouds.cheapbft.demo.MicroBenchServer](#), [navigators.smart.demo.RandomServer](#), [navigators.smart.demo.ThroughputTestServer](#), [navigators.smart.demo.LatencyTestServer](#), and [navigators.smart.demo.LatencyTestServerReplica0](#).

5.181.2.9 `void navigators.smart.service.SingleThreadedServiceReplica.passivate ()` [protected]

5.181.2.10 `ServiceCheckpoint navigators.smart.service.SingleThreadedServiceReplica.readCheckpointFrom (ByteBuffer in)`

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.11 `long navigators.smart.service.SingleThreadedServiceReplica.readoutPerformanceCounters (MeasurementResult pcexeccmds)`

5.181.2.12 `ServiceReply navigators.smart.service.SingleThreadedServiceReplica.readReplyFrom (ByteBuffer in)`

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.13 `ServiceStateUpdate navigators.smart.service.SingleThreadedServiceReplica.readStateUpdateFrom (ByteBuffer in)`

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.14 `void navigators.smart.service.SingleThreadedServiceReplica.receiveActivate ()` throws `InterruptedException`

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.15 void navigators.smart.service.SingleThreadedServiceReplica.receiveCheckpoint (ServiceCheckpoint *cp*)
throws InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.16 void navigators.smart.service.SingleThreadedServiceReplica.receiveCheckpointRequest (Consensus<?> *cons*)
throws InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.17 void navigators.smart.service.SingleThreadedServiceReplica.receivePassivate () throws InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.18 void navigators.smart.service.SingleThreadedServiceReplica.receiveServiceRequest (TOMMessage *msg*)
throws InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.19 void navigators.smart.service.SingleThreadedServiceReplica.receiveUpdate (ServiceStateUpdate *update*)
throws InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.20 void navigators.smart.service.SingleThreadedServiceReplica.shutdown ()

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.21 void navigators.smart.service.SingleThreadedServiceReplica.start () throws IOException, InterruptedException

Implements [navigators.smart.service.ServiceReplica](#).

5.181.2.22 void navigators.smart.service.SingleThreadedServiceReplica.waitForEmptyQueue ()

Implements [navigators.smart.service.ServiceReplica](#).

5.181.3 Member Data Documentation

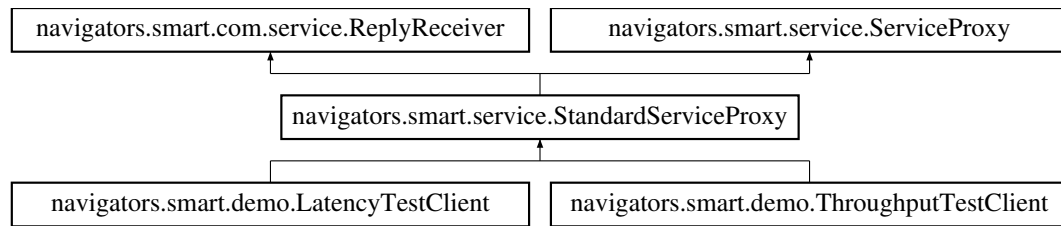
5.181.3.1 ReentrantLock navigators.smart.service.SingleThreadedServiceReplica.durationLock = new ReentrantLock()
[protected]

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

- modular-smart/src/navigators/smart/service/SingleThreadedServiceReplica.java

5.182 navigators.smart.service.StandardServiceProxy Class Reference

Inheritance diagram for navigators.smart.service.StandardServiceProxy:



Public Member Functions

- [StandardServiceProxy](#) (int id)
- [StandardServiceProxy](#) (int id, [TOMConfiguration](#) conf)
- int [getProcessID](#) ()
- [TOMConfiguration](#) [getConfig](#) ()
- void [start](#) ()
- byte[] [invoke](#) (byte[] request)
- byte[] [invoke](#) (byte[] request, boolean readOnly)
- void [receivedReply](#) ([TOMMessage](#) reply)
- void [shutdown](#) ()

Protected Member Functions

- void [initSequenceNumber](#) (int value)
- int [getCurrentSequenceNumber](#) ()
- int [doTOMMulticast](#) (byte[] m)
- int [doTOMMulticast](#) (byte[] m, boolean readOnly)
- int [doRandomTOUnicast](#) (byte[] m, boolean readOnly)
- void [doRandomTOUnicast](#) ([TOMMessage](#) m)
- int [doTOUnicast](#) (byte[] m, int receiver, boolean readOnly)
- void [doTOUnicast](#) (int receiver, [TOMMessage](#) m)
- void [TOMMulticast](#) ([TOMMessage](#) sm)
- [TOMMessage](#) [createTOMMsg](#) (byte[] m)

5.182.1 Detailed Description

This class implements a TOMReplyReceiver, and a proxy to be used on the client side of the application. It sends a request to the replicas, receives the reply, and delivers it to the application

5.182.2 Constructor & Destructor Documentation

5.182.2.1 `navigators.smart.service.StandardServiceProxy.StandardServiceProxy (int id)`

Constructor

Parameters

<i>id</i>	Process id for this client
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5.182.2.2 `navigators.smart.service.StandardServiceProxy.StandardServiceProxy (int id, TOMConfiguration conf)`

Constructor

Parameters

<i>id</i>	Process id for this client
<i>configHome</i>	Configuration directory for JBP TODO: E mesmo a directoria do JBP, ou de alguma biblioteca de terceiros?

5.182.3 Member Function Documentation

5.182.3.1 TOMMessage navigators.smart.service.StandardServiceProxy.createTOMMsg (byte[] *m*) [protected]

Create TOMMessage and sign it

Parameters

<i>m</i>	Data to be included in TOMMessage
----------	-----------------------------------

Returns

TOMMessage with serializedMsg and serializedMsgSignature fields filled

5.182.3.2 int navigators.smart.service.StandardServiceProxy.doRandomTOUnicast (byte[] *m*, boolean *readOnly*) [protected]

Unicast data to a random member of the group

Parameters

<i>m</i>	Data to be multicast
<i>readOnly</i>	it is a readonly request

5.182.3.3 void navigators.smart.service.StandardServiceProxy.doRandomTOUnicast (TOMMessage *m*) [protected]

Unicast data to a random member of the group

Parameters

<i>m</i>	Data to be multicast
<i>readOnly</i>	it is a readonly request

5.182.3.4 int navigators.smart.service.StandardServiceProxy.doTOMMulticast (byte[] *m*) [protected]

Multicast data to the group of replicas

Parameters

<i>m</i>	Data to be multicast
----------	----------------------

5.182.3.5 int navigators.smart.service.StandardServiceProxy.doTOMMulticast (byte[] *m*, boolean *readOnly*) [protected]

Multicast data to the group of replicas

Parameters

<i>m</i>	Data to be multicast
<i>readOnly</i>	it is a readonly request

5.182.3.6 `int navigators.smart.service.StandardServiceProxy.doTOUnicast (byte[] m, int receiver, boolean readOnly)`
`[protected]`

Unicast data to a member of the group

Parameters

<i>m</i>	Data to be multicast
<i>recv</i>	The receiver of the message
<i>readOnly</i>	it is a readonly request

5.182.3.7 `void navigators.smart.service.StandardServiceProxy.doTOUnicast (int receiver, TOMMessage m)`
`[protected]`

Unicast data to a member of the group

Parameters

<i>m</i>	Data to be multicast
<i>recv</i>	The receiver of the message
<i>readOnly</i>	it is a readonly request

5.182.3.8 `TOMConfiguration navigators.smart.service.StandardServiceProxy.getConfig ()`

5.182.3.9 `int navigators.smart.service.StandardServiceProxy.getCurrentSequenceNumber ()` `[protected]`

Get last sequence number of an already multicasted message

Returns

Last sequence number of an already multicasted message

TODO: Isto nao devia ter tambem um semaforo a controlar a leitura deste atributo?

5.182.3.10 `int navigators.smart.service.StandardServiceProxy.getProcessID ()`

Implements [navigators.smart.service.ServiceProxy](#).

5.182.3.11 `void navigators.smart.service.StandardServiceProxy.initSequenceNumber (int value)` `[protected]`

5.182.3.12 `byte [] navigators.smart.service.StandardServiceProxy.invoke (byte[] request)`

This method sends a request to the replicas, and returns the related reply. This method is thread-safe.

Parameters

<i>request</i>	Request to be sent
----------------	--------------------

Returns

The reply from the replicas related to request

5.182.3.13 `byte [] navigators.smart.service.StandardServiceProxy.invoke (byte[] request, boolean readOnly)`

This method sends a request to the replicas, and returns the related reply. This method is thread-safe.

Parameters

<i>request</i>	Request to be sent
<i>readOnly</i>	it is a read only request (will not be ordered)

Returns

The reply from the replicas related to request

5.182.3.14 `void navigators.smart.service.StandardServiceProxy.receivedReply (TOMMessage reply)`

This is the method invoked by the client side communication system.

Parameters

<i>reply</i>	The reply delivered by the client side communication system
--------------	---

Implements [navigators.smart.com.service.ReplyReceiver](#).

5.182.3.15 `void navigators.smart.service.StandardServiceProxy.shutdown ()`

Implements [navigators.smart.service.ServiceProxy](#).

5.182.3.16 `void navigators.smart.service.StandardServiceProxy.start ()`

Implements [navigators.smart.service.ServiceProxy](#).

5.182.3.17 `void navigators.smart.service.StandardServiceProxy.TOMMulticast (TOMMessage sm)` [protected]

Multicast a TOMMessage to the group of replicas

Parameters

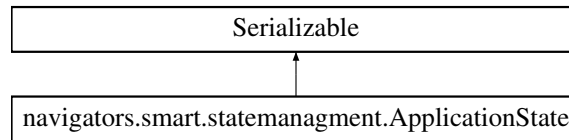
<i>m</i>	Data to be multicast
----------	----------------------

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

- modular-smart/src/navigators/smart/service/StandardServiceProxy.java

5.183 `navigators.smart.statemanagment.ApplicationState` Class Reference

Inheritance diagram for `navigators.smart.statemanagment.ApplicationState`:



Public Member Functions

- [ApplicationState](#) (long [lastCheckpointEid](#), int [lastCheckpointRound](#), int [lastCheckpointLeader](#), long [lastEid](#), byte[] [state](#), byte[] [stateHash](#), byte[] [leadermodulestate](#), [BatchInfo](#)[] [messageBatches](#))
- [ApplicationState](#) ()
- [BatchInfo](#) [getMessageBatch](#) (long [eid](#))
- boolean [equals](#) (Object obj)
- int [hashCode](#) ()

Public Attributes

- final [BatchInfo](#)[] [messageBatches](#)
- final long [lastCheckpointEid](#)
- final int [lastCheckpointRound](#)
- final int [lastCheckpointLeader](#)
- final byte[] [state](#)
- final byte[] [stateHash](#)
- final long [lastEid](#)
- final boolean [hasState](#)
- final byte[] [leadermodulestate](#)

5.183.1 Detailed Description

This classe represents a state tranfered from a replica to another. The state associated with the last checkpoint together with all the batches of messages received do far, comprises the sender's current state

5.183.2 Constructor & Destructor Documentation

- 5.183.2.1 [navigators.smart.statemanagment.ApplicationState.ApplicationState](#) (long [lastCheckpointEid](#), int [lastCheckpointRound](#), int [lastCheckpointLeader](#), long [lastEid](#), byte[] [state](#), byte[] [stateHash](#), byte[] [leadermodulestate](#), [BatchInfo](#)[] [messageBatches](#))

Constructs a TansferableState This constructor should be used when there is a valid state to construct the object with

Parameters

<i>lastCheckpointEid</i>	Execution ID for the last checkpoint
<i>lastCheckpointRound</i>	The round in which the last execution of this checkpoint was decided
<i>lastEid</i>	The last ExecutionId that was executed within this checkpoint
<i>state</i>	State associated with the last checkpoint
<i>stateHash</i>	Hash of the state associated with the last checkpoint
<i>leaderModulestate</i>	Serialized version of the current state of the leader module to be sent to the slow replica
<i>messageBatches</i>	the Batches logged after the state was stored

5.183.2.2 `navigators.smart.statemanagment.ApplicationState.ApplicationState ()`

Constructs a TansferableState This constructor should be used when there isn't a valid state to construct the object with

5.183.3 Member Function Documentation

5.183.3.1 `boolean navigators.smart.statemanagment.ApplicationState.equals (Object obj)`

5.183.3.2 `BatchInfo navigators.smart.statemanagment.ApplicationState.getMessageBatch (long eid)`

Retrieves the specified batch of messages

Parameters

<i>eid</i>	Execution ID associated with the batch to be fetched
------------	--

Returns

The batch of messages associated with the batch correspondent execution ID

5.183.3.3 `int navigators.smart.statemanagment.ApplicationState.hashCode ()`

5.183.4 Member Data Documentation

5.183.4.1 `final boolean navigators.smart.statemanagment.ApplicationState.hasState`

5.183.4.2 `final long navigators.smart.statemanagment.ApplicationState.lastCheckpointEid`

5.183.4.3 `final int navigators.smart.statemanagment.ApplicationState.lastCheckpointLeader`

5.183.4.4 `final int navigators.smart.statemanagment.ApplicationState.lastCheckpointRound`

5.183.4.5 `final long navigators.smart.statemanagment.ApplicationState.lastEid`

5.183.4.6 `final byte [] navigators.smart.statemanagment.ApplicationState.leadermodulestate`

5.183.4.7 `final BatchInfo [] navigators.smart.statemanagment.ApplicationState.messageBatches`

5.183.4.8 `final byte [] navigators.smart.statemanagment.ApplicationState.state`

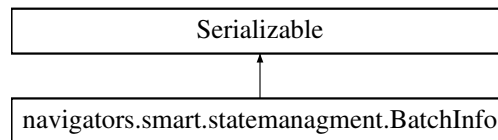
5.183.4.9 `final byte [] navigators.smart.statemanagment.ApplicationState.stateHash`

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

- `modular-smart/src/navigators/smart/statemanagment/ApplicationState.java`

5.184 `navigators.smart.statemanagment.BatchInfo` Class Reference

Inheritance diagram for `navigators.smart.statemanagment.BatchInfo`:



Public Member Functions

- [BatchInfo](#) ()
- [BatchInfo](#) (byte[] [batch](#), int [round](#), int [leader](#))
- boolean [equals](#) (Object *obj*)
- int [hashCode](#) ()
- String [toString](#) ()

Public Attributes

- final byte[] [batch](#)
- final int [round](#)
- final int [leader](#)

5.184.1 Constructor & Destructor Documentation

5.184.1.1 `navigators.smart.statemanagment.BatchInfo.BatchInfo ()`

5.184.1.2 `navigators.smart.statemanagment.BatchInfo.BatchInfo (byte[] batch, int round, int leader)`

5.184.2 Member Function Documentation

5.184.2.1 `boolean navigators.smart.statemanagment.BatchInfo.equals (Object obj)`

5.184.2.2 `int navigators.smart.statemanagment.BatchInfo.hashCode ()`

5.184.2.3 `String navigators.smart.statemanagment.BatchInfo.toString ()`

5.184.3 Member Data Documentation

5.184.3.1 `final byte [] navigators.smart.statemanagment.BatchInfo.batch`

5.184.3.2 `final int navigators.smart.statemanagment.BatchInfo.leader`

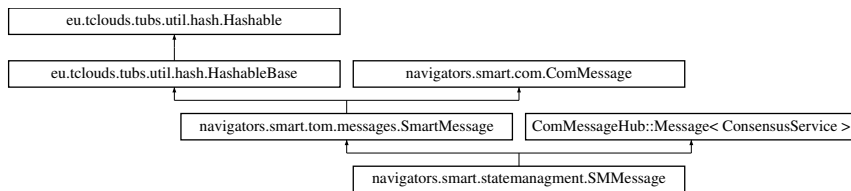
5.184.3.3 `final int navigators.smart.statemanagment.BatchInfo.round`

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

- `modular-smart/src/navigators/smart/statemanagment/BatchInfo.java`

5.185 navigators.smart.statemanagment.SMMessage Class Reference

Inheritance diagram for `navigators.smart.statemanagment.SMMessage`:



Public Member Functions

- [SMMMessage](#) (int sender, long eid, int type, int replica, [TransferableState](#) state)
- [SMMMessage](#) (ByteBuffer in) throws IOException, ClassNotFoundException
- [TransferableState](#) getState ()
- void [process](#) ([ConsensusService](#) service)
- int [getType](#) ()
- long [getEid](#) ()
- int [getReplica](#) ()
- int [getPayloadSize](#) ()

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

5.185.1 Detailed Description

This classe represents a message used in the state transfer protocol

5.185.2 Constructor & Destructor Documentation

5.185.2.1 `navigators.smart.statemanagment.SMMMessage.SMMMessage (int sender, long eid, int type, int replica, TransferableState state)`

Constructs a [SMMMessage](#)

Parameters

<i>sender</i>	Process Id of the sender
<i>eid</i>	Execution ID up to which the sender needs to be updated
<i>type</i>	Message type
<i>replica</i>	Replica that should send the state
<i>state</i>	State log

5.185.2.2 `navigators.smart.statemanagment.SMMMessage.SMMMessage (ByteBuffer in)` throws IOException, ClassNotFoundException

5.185.3 Member Function Documentation

5.185.3.1 `long navigators.smart.statemanagment.SMMMessage.getEid ()`

Retrieves the execution ID up to which the sender needs to be updated

Returns

The execution ID up to which the sender needs to be updated

5.185.3.2 `int navigators.smart.statemanagment.SMMessage.getPayloadSize ()`

5.185.3.3 `int navigators.smart.statemanagment.SMMessage.getReplica ()`

Retrieves the replica that should send the state

Returns

The replica that should send the state

5.185.3.4 `TransferableState navigators.smart.statemanagment.SMMessage.getState ()`

Retrieves the state log

Returns

The state Log

5.185.3.5 `int navigators.smart.statemanagment.SMMessage.getType ()`

Retrieves the type of the message

Returns

The type of the message

5.185.3.6 `void navigators.smart.statemanagment.SMMessage.process (ConsensusService service)`

5.185.3.7 `void navigators.smart.statemanagment.SMMessage.writePayloadTo (MessageSink sink) [protected]`

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

- modular-smart/src/navigators/smart/statemanagment/SMMessage.java

5.186 navigators.smart.statemanagment.StateLog Class Reference

Public Member Functions

- [StateLog](#) (int k)
- void [newCheckpoint](#) (long lastCPEid, int lastCPRound, int lastCPLeader, long lastEid, byte[] state, byte[] stateHash, byte[] lstate)
- void [setLastCheckpointEid](#) (long lastCheckpointEid)
- long [getLastCheckpointEid](#) ()
- void [setLastCheckpointRound](#) (int lastCheckpointRound)
- int [getLastCheckpointRound](#) ()
- void [setLastCheckpointLeader](#) (int lastCheckpointLeader)
- int [getLastCheckpointLeader](#) ()
- void [setLastEid](#) (long lastEid)

- long [getLastEid](#) ()
- byte[] [getState](#) ()
- byte[] [getStateHash](#) ()
- void [addMessageBatch](#) (byte[] batch, int round, int leader)
- [BatchInfo](#) [getMessageBatch](#) (int eid)
- [BatchInfo](#)[] [getMessageBatches](#) ()
- int [getNumBatches](#) ()
- [TransferableState](#) [getTransferableState](#) (long eid, boolean setState)
- void [update](#) ([TransferableState](#) transState)
- String [toString](#) ()

5.186.1 Detailed Description

This classes serves as a log for the state associated with the last checkpoint, and the message batches received since the same checkpoint until the present. The state associated with the last checkpoint together with all the batches of messages received so far, comprises this replica current state

5.186.2 Constructor & Destructor Documentation

5.186.2.1 `navigators.smart.statemanagment.StateLog.StateLog (int k)`

Constructs a State log

Parameters

<i>k</i>	The chekpoint period
----------	----------------------

5.186.3 Member Function Documentation

5.186.3.1 `void navigators.smart.statemanagment.StateLog.addMessageBatch (byte[] batch, int round, int leader)`

Adds a message batch to the log. This batches should be added to the log in the same order in which they are delivered to the application. Only the 'k' batches received after the last checkpoint are supposed to be kept

Parameters

<i>batch</i>	The batch of messages to be kept.
--------------	-----------------------------------

Returns

True if the batch was added to the log, false otherwise

5.186.3.2 `long navigators.smart.statemanagment.StateLog.getLastCheckpointEid ()`

Retrieves the execution ID for the last checkpoint

Returns

Execution ID for the last checkpoint, or -1 if none was obtained

5.186.3.3 `int navigators.smart.statemanagment.StateLog.getLastCheckpointLeader ()`

Retrieves the leader for the last checkpoint

Returns

Leader for the last checkpoint, or -1 if none was obtained

5.186.3.4 `int navigators.smart.statemanagment.StateLog.getLastCheckpointRound ()`

Retrieves the decision round for the last checkpoint

Returns

Decision round for the last checkpoint, or -1 if none was obtained

5.186.3.5 `long navigators.smart.statemanagment.StateLog.getLastEid ()`

Retrieves the execution ID for the last messages batch delivered to the application

Returns

Execution ID for the last messages batch delivered to the application

5.186.3.6 `BatchInfo navigators.smart.statemanagment.StateLog.getMessageBatch (int eid)`

Returns a batch of messages, given its correspondent execution ID

Parameters

<i>eid</i>	Execution ID associated with the batch to be fetched
------------	--

Returns

The batch of messages associated with the batch correspondent execution ID

5.186.3.7 `BatchInfo [] navigators.smart.statemanagment.StateLog.getMessageBatches ()`

Retrieves all the stored batches kept since the last checkpoint

Returns

All the stored batches kept since the last checkpoint

5.186.3.8 `int navigators.smart.statemanagment.StateLog.getNumBatches ()`

Retrieves the total number of stored batches kept since the last checkpoint

Returns

The total number of stored batches kept since the last checkpoint

5.186.3.9 `byte [] navigators.smart.statemanagment.StateLog.getState ()`

Retrieves the state associated with the last checkpoint

Returns

State associated with the last checkpoint

5.186.3.10 `byte [] navigators.smart.statemanagment.StateLog.getStateHash ()`

Retrieves the hash of the state associated with the last checkpoint

Returns

Hash of the state associated with the last checkpoint

5.186.3.11 `TransferableState navigators.smart.statemanagment.StateLog.getTransferableState (long eid, boolean setState)`

Constructs a [TransferableState](#) using this log information

Parameters

<i>eid</i>	Execution ID correspondent to desired state
------------	---

Returns

[TransferableState](#) Object containing this log information

5.186.3.12 `void navigators.smart.statemanagment.StateLog.newCheckpoint (long lastCPEid, int lastCPRound, int lastCPLeader, long lastEid, byte[] state, byte[] stateHash, byte[] lmstate)`

Sets the state associated with the last checkpoint, and updates the execution IDs associated with it

Parameters

<i>lastCPEid</i>	
<i>lastCPRound</i>	
<i>lastCPLeader</i>	
<i>lastEid</i>	
<i>state</i>	
<i>stateHash</i>	
<i>lmstate</i>	

5.186.3.13 `void navigators.smart.statemanagment.StateLog.setLastCheckpointEid (long lastCheckpointEid)`

Sets the execution ID for the last checkpoint

Parameters

<i>lastCheckpointEid</i>	Execution ID for the last checkpoint
--------------------------	--------------------------------------

5.186.3.14 `void navigators.smart.statemanagment.StateLog.setLastCheckpointLeader (int lastCheckpointLeader)`

Sets the leader for the last checkpoint

Parameters

<i>lastCheckpoint-Eid</i>	Leader for the last checkpoint
---------------------------	--------------------------------

5.186.3.15 void navigators.smart.statemanagment.StateLog.setLastCheckpointRound (int *lastCheckpointRound*)

Sets the decision round for the last checkpoint

Parameters

<i>lastCheckpoint-Eid</i>	Decision round for the last checkpoint
---------------------------	--

5.186.3.16 void navigators.smart.statemanagment.StateLog.setLastEid (long *lastEid*)

Sets the execution ID for the last messages batch delivered to the application

Parameters

<i>lastEid</i>	the execution ID for the last messages batch delivered to the application
----------------	---

5.186.3.17 String navigators.smart.statemanagment.StateLog.toString ()

5.186.3.18 void navigators.smart.statemanagment.StateLog.update (TransferableState *transState*)

Updates this log, according to the information contained in the [TransferableState](#) object

Parameters

<i>transState</i>	TransferableState object containing the information which is used to updated this log
-------------------	---

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

- modular-smart/src/navigators/smart/statemanagment/StateLog.java

5.187 navigators.smart.statemanagment.StateManager Class Reference

Public Member Functions

- [StateManager](#) (int k, int f, int n, int me)
- int [getReplica](#) ()
- void [changeReplica](#) ()
- void [setReplicaState](#) (byte[] state)
- byte[] [getReplicaState](#) ()
- void [addEID](#) (int sender, long eid)
- void [emptyEIDs](#) ()
- void [emptyEIDs](#) (int eid)
- void [addState](#) (int sender, [TransferableState](#) state)
- void [emptyStates](#) ()
- long [getWaiting](#) ()
- void [setWaiting](#) (long wait)
- void [setLastEID](#) (long eid)

- long [getLastEID](#) ()
- boolean [moreThenF_EIDs](#) (long *eid*)
- boolean [moreThenF_Replies](#) ()
- [TransferableState](#) [getValidState](#) ()
- int [getReplies](#) ()
- [StateLog](#) [getLog](#) ()

5.187.1 Constructor & Destructor Documentation

5.187.1.1 `navigators.smart.statemanagment.StateManager.StateManager (int k, int f, int n, int me)`

5.187.2 Member Function Documentation

5.187.2.1 `void navigators.smart.statemanagment.StateManager.addEID (int sender, long eid)`

5.187.2.2 `void navigators.smart.statemanagment.StateManager.addState (int sender, TransferableState state)`

5.187.2.3 `void navigators.smart.statemanagment.StateManager.changeReplica ()`

5.187.2.4 `void navigators.smart.statemanagment.StateManager.emptyEIDs ()`

5.187.2.5 `void navigators.smart.statemanagment.StateManager.emptyEIDs (int eid)`

5.187.2.6 `void navigators.smart.statemanagment.StateManager.emptyStates ()`

5.187.2.7 `long navigators.smart.statemanagment.StateManager.getLastEID ()`

5.187.2.8 `StateLog navigators.smart.statemanagment.StateManager.getLog ()`

5.187.2.9 `int navigators.smart.statemanagment.StateManager.getReplica ()`

5.187.2.10 `byte [] navigators.smart.statemanagment.StateManager.getReplicaState ()`

5.187.2.11 `int navigators.smart.statemanagment.StateManager.getReplies ()`

5.187.2.12 `TransferableState navigators.smart.statemanagment.StateManager.getValidState ()`

5.187.2.13 `long navigators.smart.statemanagment.StateManager.getWaiting ()`

5.187.2.14 `boolean navigators.smart.statemanagment.StateManager.moreThenF_EIDs (long eid)`

5.187.2.15 `boolean navigators.smart.statemanagment.StateManager.moreThenF_Replies ()`

5.187.2.16 `void navigators.smart.statemanagment.StateManager.setLastEID (long eid)`

5.187.2.17 `void navigators.smart.statemanagment.StateManager.setReplicaState (byte[] state)`

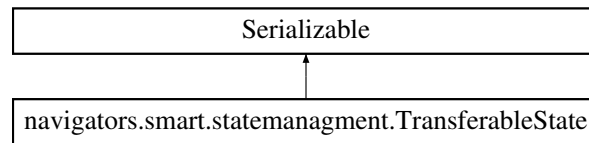
5.187.2.18 `void navigators.smart.statemanagment.StateManager.setWaiting (long wait)`

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

- `modular-smart/src/navigators/smart/statemanagment/StateManager.java`

5.188 navigators.smart.statemanagment.TransferableState Class Reference

Inheritance diagram for navigators.smart.statemanagment.TransferableState:



Public Member Functions

- [TransferableState](#) (long [lastCheckpointEid](#), int [lastCheckpointRound](#), int [lastCheckpointLeader](#), long [lastEid](#), byte[] [state](#), byte[] [stateHash](#), byte[] [leadermodulestate](#), [BatchInfo](#)[] [messageBatches](#))
- [TransferableState](#) ()
- [BatchInfo](#) [getMessageBatch](#) (long [eid](#))
- boolean [equals](#) (Object [obj](#))
- int [hashCode](#) ()

Public Attributes

- final [BatchInfo](#)[] [messageBatches](#)
- final long [lastCheckpointEid](#)
- final int [lastCheckpointRound](#)
- final int [lastCheckpointLeader](#)
- final byte[] [state](#)
- final byte[] [stateHash](#)
- final long [lastEid](#)
- final boolean [hasState](#)
- final byte[] [leadermodulestate](#)

5.188.1 Detailed Description

This classe represents a state tranfered from a replica to another. The state associated with the last checkpoint together with all the batches of messages received do far, comprises the sender's current state

5.188.2 Constructor & Destructor Documentation

5.188.2.1 `navigators.smart.statemanagment.TransferableState.TransferableState (long lastCheckpointEid, int lastCheckpointRound, int lastCheckpointLeader, long lastEid, byte[] state, byte[] stateHash, byte[] leadermodulestate, BatchInfo[] messageBatches)`

Constructs a TansferableState This constructor should be used when there is a valid state to construct the object with

Parameters

<i>lastCheckpointEid</i>	Execution ID for the last checkpoint
<i>lastCheckpointRound</i>	The round in which the last execution of this checkpoint was decided
<i>lastEid</i>	The last ExecutionId that was executed within this checkpoint
<i>state</i>	State associated with the last checkpoint

<i>stateHash</i>	Hash of the state associated with the last checkpoint
<i>leader-Modulestate</i>	Serialized version of the current state of the leader module to be sent to the slow replica
<i>message-Batches</i>	the Batches logged after the state was stored

5.188.2.2 navigators.smart.statemanagment.TransferableState.TransferableState ()

Constructs a TansferableState This constructor should be used when there isn't a valid state to construct the object with

5.188.3 Member Function Documentation

5.188.3.1 boolean navigators.smart.statemanagment.TransferableState.equals (Object *obj*)

5.188.3.2 BatchInfo navigators.smart.statemanagment.TransferableState.getMessageBatch (long *eid*)

Retrieves the specified batch of messages

Parameters

<i>eid</i>	Execution ID associated with the batch to be fetched
------------	--

Returns

The batch of messages associated with the batch correspondent execution ID

5.188.3.3 int navigators.smart.statemanagment.TransferableState.hashCode ()

5.188.4 Member Data Documentation

5.188.4.1 final boolean navigators.smart.statemanagment.TransferableState.hasState

5.188.4.2 final long navigators.smart.statemanagment.TransferableState.lastCheckpointEid

5.188.4.3 final int navigators.smart.statemanagment.TransferableState.lastCheckpointLeader

5.188.4.4 final int navigators.smart.statemanagment.TransferableState.lastCheckpointRound

5.188.4.5 final long navigators.smart.statemanagment.TransferableState.lastEid

5.188.4.6 final byte [] navigators.smart.statemanagment.TransferableState.leadermodulestate

5.188.4.7 final BatchInfo [] navigators.smart.statemanagment.TransferableState.messageBatches

5.188.4.8 final byte [] navigators.smart.statemanagment.TransferableState.state

5.188.4.9 final byte [] navigators.smart.statemanagment.TransferableState.stateHash

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

- modular-smart/src/navigators/smart/statemanagment/TransferableState.java

5.189 navigators.smart.tests.util.TestHelper Class Reference

Static Public Member Functions

- static byte[] [createTestByte](#) ()

5.189.1 Member Function Documentation

5.189.1.1 static byte [] navigators.smart.tests.util.TestHelper.createTestByte () [static]

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

- modular-smart/test/navigators/smart/tests/util/TestHelper.java

5.190 navigators.smart.tom.core.messages.TOMMessageTest Class Reference

Public Member Functions

- void [testMsgSize](#) ()
- void [testSerialise](#) ()
- void [testCompareTo](#) ()

5.190.1 Member Function Documentation

5.190.1.1 void navigators.smart.tom.core.messages.TOMMessageTest.testCompareTo ()

5.190.1.2 void navigators.smart.tom.core.messages.TOMMessageTest.testMsgSize ()

5.190.1.3 void navigators.smart.tom.core.messages.TOMMessageTest.testSerialise ()

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

- modular-smart/test/navigators/smart/tom/core/messages/TOMMessageTest.java

5.191 navigators.smart.tom.core.TOMLayerTest Class Reference

Public Member Functions

- void [setUp](#) () throws Exception
- void [tearDown](#) () throws Exception
- void [testComputeHash](#) ()
- void [testRequestReceived](#) ()
- void [testCreatePropose](#) ()
- void [testDecided](#) ()
- void [testCheckProposedValue](#) ()
- void [testRequestStateTransfer](#) ()
- void [testSMRequestDeliver](#) ()
- void [testSMReplyDeliver](#) ()
- void [testIsRetrievingState](#) ()
- void [testHasPendingRequests](#) ()

Package Attributes

- TOMReceiver [recv](#)
- TOMConfiguration [conf](#)
- ServerCommunicationSystem [cs](#)

5.191.1 Member Function Documentation

5.191.1.1 void navigators.smart.tom.core.TOMLayerTest.setUp () throws Exception

Exceptions

<i>java.lang.Exception</i>	
----------------------------	--

5.191.1.2 void navigators.smart.tom.core.TOMLayerTest.tearDown () throws Exception

Exceptions

<i>java.lang.Exception</i>	
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5.191.1.3 void navigators.smart.tom.core.TOMLayerTest.testCheckProposedValue ()

Test method for navigators.smart.tom.core.TOMLayer#checkProposedValue(byte[]).

5.191.1.4 void navigators.smart.tom.core.TOMLayerTest.testComputeHash ()

Test method for navigators.smart.tom.core.TOMLayer#computeHash(byte[]).

5.191.1.5 void navigators.smart.tom.core.TOMLayerTest.testCreatePropose ()

Test method for navigators.smart.tom.core.TOMLayer#createPropose().

5.191.1.6 void navigators.smart.tom.core.TOMLayerTest.testDecided ()

Test method for navigators.smart.tom.core.TOMLayer#decided(navigators.smart.consensus.Consensus).

5.191.1.7 void navigators.smart.tom.core.TOMLayerTest.testHasPendingRequests ()

Test method for navigators.smart.tom.core.TOMLayer#hasPendingRequests().

5.191.1.8 void navigators.smart.tom.core.TOMLayerTest.testIsRetrievingState ()

Test method for navigators.smart.tom.core.TOMLayer#isRetrievingState().

5.191.1.9 void navigators.smart.tom.core.TOMLayerTest.testRequestReceived ()

Test method for navigators.smart.tom.core.TOMLayer#requestReceived(navigators.smart.tom.core.messages.TOMMessage).

5.191.1.10 void navigators.smart.tom.core.TOMLayerTest.testRequestStateTransfer ()

Test method for navigators.smart.tom.core.TOMLayer#requestStateTransfer(int, int[], int, long).

5.191.1.11 void navigators.smart.tom.core.TOMLayerTest.testSMReplyDeliver ()

Test method for navigators.smart.tom.core.TOMLayer#SMReplyDeliver(navigators.smart.statemanagment.SM-Message).

5.191.1.12 void navigators.smart.tom.core.TOMLayerTest.testSMRequestDeliver ()

Test method for navigators.smart.tom.core.TOMLayer#SMRequestDeliver(navigators.smart.statemanagment.SM-Message).

5.191.2 Member Data Documentation

5.191.2.1 TOMConfiguration navigators.smart.tom.core.TOMLayerTest.conf [package]

5.191.2.2 ServerCommunicationSystem navigators.smart.tom.core.TOMLayerTest.cs [package]

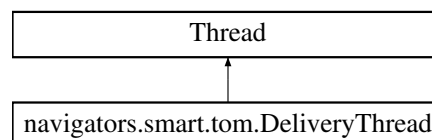
5.191.2.3 TOMReceiver navigators.smart.tom.core.TOMLayerTest.recv [package]

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

- modular-smart/test/navigators/smart/tom/core/TOMLayerTest.java

5.192 navigators.smart.tom.DeliveryThread Class Reference

Inheritance diagram for navigators.smart.tom.DeliveryThread:



Public Member Functions

- [DeliveryThread](#) (TOMLayer tomLayer, [ServiceReplica](#) recv, [TOMConfiguration](#) conf)
- void [delivery](#) (Consensus< [TOMMessage](#)[]> cons)
- void [deliverLock](#) ()
- void [deliverUnlock](#) ()
- void [canDeliver](#) ()
- void [update](#) ([TransferableState](#) transferredState)
- void [run](#) ()

5.192.1 Detailed Description

This class implements a thread which will deliver totally ordered requests to the application

5.192.2 Constructor & Destructor Documentation

5.192.2.1 navigators.smart.tom.DeliveryThread.DeliveryThread (TOMLayer *tomLayer*, ServiceReplica *recv*, TOMConfiguration *conf*)

Creates a new instance of [DeliveryThread](#)

Parameters

<i>tomLayer</i>	TOM layer
<i>recv</i>	The receiver of the decided requests
<i>conf</i>	TOM configuration
<i>consensus</i>	The consensus service that decides the order

5.192.3 Member Function Documentation

5.192.3.1 void navigators.smart.tom.DeliveryThread.canDeliver ()

5.192.3.2 void navigators.smart.tom.DeliveryThread.deliverLock ()

5.192.3.3 void navigators.smart.tom.DeliveryThread.deliverUnlock ()

5.192.3.4 void navigators.smart.tom.DeliveryThread.delivery (Consensus< TOMMessage[]> *cons*)

Invoked by the TOM layer, to deliver a decide consensus

Parameters

<i>cons</i>	MeasuringConsensus established as being decided
-------------	---

5.192.3.5 void navigators.smart.tom.DeliveryThread.run ()

This is the code for the thread. It delivers decided consensus to the TOM request receiver object (which is the application) ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

ISTO E CODIGO DO JOAO, PARA TRATAR DE DEBUGGING

ISTO E CODIGO DO JOAO, PARA TRATAR DOS CHECKPOINTS

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

5.192.3.6 void navigators.smart.tom.DeliveryThread.update (TransferableState *transferredState*)

Nao consigo perceber se isto tem utilidade neste contexto

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

- modular-smart/src/navigators/smart/tom/DeliveryThread.java

5.193 navigators.smart.tom.demo.AllinOneTest Class Reference

Static Public Member Functions

- static void [main](#) (String args[]) throws Exception

5.193.1 Member Function Documentation

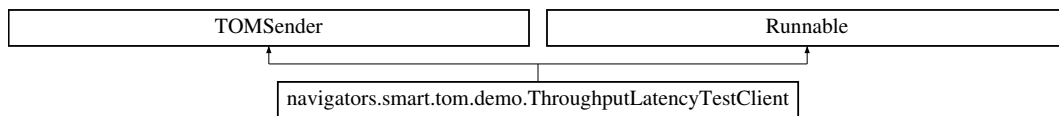
5.193.1.1 `static void navigators.smart.tom.demo.AllinOneTest.main (String args[]) throws Exception` `[static]`

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

- modular-smart/archive/AllinOneTest.java

5.194 navigators.smart.tom.demo.ThroughputLatencyTestClient Class Reference

Inheritance diagram for navigators.smart.tom.demo.ThroughputLatencyTestClient:



Public Member Functions

- [ThroughputLatencyTestClient](#) (int *id*, int *exec*, int *argSize*, int *interval*, [TOMConfiguration](#) *conf*, boolean *multi-cast*)
- void [run](#) ()
- void [receivedReply](#) ([TOMMessage](#) *reply*)
- long [mean](#) (long[] *a*)

Static Public Member Functions

- static void [main](#) (String[] *args*)

Static Package Attributes

- static int [numThreads](#)

5.194.1 Constructor & Destructor Documentation

5.194.1.1 `navigators.smart.tom.demo.ThroughputLatencyTestClient.ThroughputLatencyTestClient (int id, int exec, int argSize, int interval, TOMConfiguration conf, boolean multicast)`

5.194.2 Member Function Documentation

5.194.2.1 `static void navigators.smart.tom.demo.ThroughputLatencyTestClient.main (String[] args)` `[static]`

5.194.2.2 `long navigators.smart.tom.demo.ThroughputLatencyTestClient.mean (long[] a)`

5.194.2.3 `void navigators.smart.tom.demo.ThroughputLatencyTestClient.receivedReply (TOMMessage reply)`

5.194.2.4 `void navigators.smart.tom.demo.ThroughputLatencyTestClient.run ()`

5.194.3 Member Data Documentation

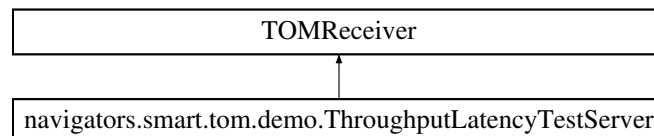
5.194.3.1 `int navigators.smart.tom.demo.ThroughputLatencyTestClient.numThreads` `[static], [package]`

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

- modular-smart/archive/ThroughputLatencyTestClient.java

5.195 `navigators.smart.tom.demo.ThroughputLatencyTestServer` Class Reference

Inheritance diagram for `navigators.smart.tom.demo.ThroughputLatencyTestServer`:



Public Member Functions

- [ThroughputLatencyTestServer](#) (int id, int interval, int averageliterations)
- void [run](#) () throws ConfigurationException, IOException
- void [receiveOrderedMessage](#) (TOMMessage msg)
- byte[] [getState](#) ()
- void [waitForEmptyQueue](#) ()
- void [setState](#) (byte[] state)
- void [receiveMessage](#) (TOMMessage msg)
- void [applyUpdate](#) (byte[] update)

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Attributes

- ReentrantLock [durationLock](#) = new ReentrantLock()
- BlockingQueue< Integer > [batchDuration](#)

Package Attributes

- [Storage st](#)
- [Storage totalLatencySt1](#)
- [Storage batchSt1](#)
- [Storage totalLatencySt2](#)
- [Storage batchSt2](#)

5.195.1 Constructor & Destructor Documentation

5.195.1.1 `navigators.smart.tom.demo.ThroughputLatencyTestServer.ThroughputLatencyTestServer (int id, int interval, int averageliterations)`

5.195.2 Member Function Documentation

- 5.195.2.1 void navigators.smart.tom.demo.ThroughputLatencyTestServer.applyUpdate (byte[] *update*)
- 5.195.2.2 byte [] navigators.smart.tom.demo.ThroughputLatencyTestServer.getState ()
- 5.195.2.3 static void navigators.smart.tom.demo.ThroughputLatencyTestServer.main (String[] *args*) throws Exception
[static]
- 5.195.2.4 void navigators.smart.tom.demo.ThroughputLatencyTestServer.receiveMessage (TOMMessage *msg*)
- 5.195.2.5 void navigators.smart.tom.demo.ThroughputLatencyTestServer.receiveOrderedMessage (TOMMessage *msg*)
- 5.195.2.6 void navigators.smart.tom.demo.ThroughputLatencyTestServer.run () throws ConfigurationException,
IOException

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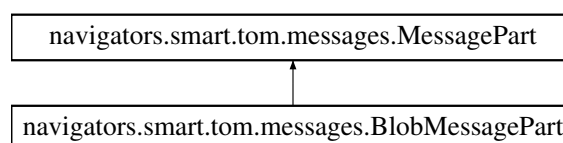
- 5.195.2.7 void navigators.smart.tom.demo.ThroughputLatencyTestServer.setState (byte[] *state*)
- 5.195.2.8 void navigators.smart.tom.demo.ThroughputLatencyTestServer.waitForEmptyQueue ()
- 5.195.3 Member Data Documentation
- 5.195.3.1 BlockingQueue<Integer> navigators.smart.tom.demo.ThroughputLatencyTestServer.batchDuration
[protected]
- 5.195.3.2 Storage navigators.smart.tom.demo.ThroughputLatencyTestServer.batchSt1 [package]
- 5.195.3.3 Storage navigators.smart.tom.demo.ThroughputLatencyTestServer.batchSt2 [package]
- 5.195.3.4 ReentrantLock navigators.smart.tom.demo.ThroughputLatencyTestServer.durationLock = new ReentrantLock()
[protected]
- 5.195.3.5 Storage navigators.smart.tom.demo.ThroughputLatencyTestServer.st [package]
- 5.195.3.6 Storage navigators.smart.tom.demo.ThroughputLatencyTestServer.totalLatencySt1 [package]
- 5.195.3.7 Storage navigators.smart.tom.demo.ThroughputLatencyTestServer.totalLatencySt2 [package]

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

- modular-smart/archive/ThroughputLatencyTestServer.java

5.196 navigators.smart.tom.messages.BlobMessagePart Class Reference

Inheritance diagram for navigators.smart.tom.messages.BlobMessagePart:



Public Member Functions

- [BlobMessagePart](#) (byte[] data)
- [MessageSink writeTo](#) ([MessageSink](#) sink)
- [ExtMessageDigest updateHash](#) ([ExtMessageDigest](#) digest)
- byte[] [getData](#) ()
- int [getSize](#) ()
- void [initHashTasks](#) ([HasherPool](#)< [Hashable](#) > hasherpool)

Static Public Member Functions

- static [BlobMessagePart readFrom](#) ([ByteBuffer](#) in)

Static Public Attributes

- static final int [CHUNK_SIZE](#) = 2048
- static final int [CHUNK_THRESHOLD](#) = 2*[CHUNK_SIZE](#)
- static final int [HASH_THRESHOLD](#) = 128

5.196.1 Constructor & Destructor Documentation

5.196.1.1 [navigators.smart.tom.messages.BlobMessagePart.BlobMessagePart](#) (byte[] data)

5.196.2 Member Function Documentation

5.196.2.1 byte [] [navigators.smart.tom.messages.BlobMessagePart.getData](#) ()

5.196.2.2 int [navigators.smart.tom.messages.BlobMessagePart.getSize](#) ()

Implements [navigators.smart.tom.messages.MessagePart](#).

5.196.2.3 void [navigators.smart.tom.messages.BlobMessagePart.initHashTasks](#) ([HasherPool](#)< [Hashable](#) > hasherpool)

Implements [navigators.smart.tom.messages.MessagePart](#).

5.196.2.4 static [BlobMessagePart](#) [navigators.smart.tom.messages.BlobMessagePart.readFrom](#) ([ByteBuffer](#) in)
[static]

5.196.2.5 [ExtMessageDigest](#) [navigators.smart.tom.messages.BlobMessagePart.updateHash](#) ([ExtMessageDigest](#) digest)

Implements [navigators.smart.tom.messages.MessagePart](#).

5.196.2.6 [MessageSink](#) [navigators.smart.tom.messages.BlobMessagePart.writeTo](#) ([MessageSink](#) sink)

Implements [navigators.smart.tom.messages.MessagePart](#).

5.196.3 Member Data Documentation

5.196.3.1 `final int navigators.smart.tom.messages.BlobMessagePart.CHUNK_SIZE = 2048` [static]

5.196.3.2 `final int navigators.smart.tom.messages.BlobMessagePart.CHUNK_THRESHOLD = 2*CHUNK_SIZE` [static]

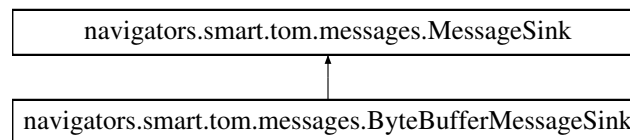
5.196.3.3 `final int navigators.smart.tom.messages.BlobMessagePart.HASH_THRESHOLD = 128` [static]

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

- modular-smart/src/navigators/smart/tom/messages/BlobMessagePart.java

5.197 navigators.smart.tom.messages.ByteBufferMessageSink Class Reference

Inheritance diagram for `navigators.smart.tom.messages.ByteBufferMessageSink`:



Public Member Functions

- [ByteBufferMessageSink](#) (`ByteBuffer buf`)
- [MessageSink put](#) (`byte b`)
- [MessageSink put](#) (`byte[] src`)
- [MessageSink put](#) (`byte[] src, int offset, int length`)
- [MessageSink put](#) (`ByteBuffer src`)
- [MessageSink putChar](#) (`char c`)
- [MessageSink putDouble](#) (`double d`)
- [MessageSink putFloat](#) (`float f`)
- [MessageSink putInt](#) (`int i`)
- [MessageSink putLong](#) (`long l`)
- [MessageSink putShort](#) (`short s`)
- [MessageSink putPart](#) ([MessagePart](#) part)

5.197.1 Constructor & Destructor Documentation

5.197.1.1 `navigators.smart.tom.messages.ByteBufferMessageSink.ByteBufferMessageSink (ByteBuffer buf)`

5.197.2 Member Function Documentation

5.197.2.1 `MessageSink navigators.smart.tom.messages.ByteBufferMessageSink.put (byte b)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.2 `MessageSink navigators.smart.tom.messages.ByteBufferMessageSink.put (byte[] src)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.3 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.put (byte[] src, int offset, int length)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.4 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.put (ByteBuffer src)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.5 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putChar (char c)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.6 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putDouble (double d)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.7 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putFloat (float f)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.8 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putInt (int i)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.9 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putLong (long l)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.10 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putPart (MessagePart part)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.197.2.11 **MessageSink** `navigators.smart.tom.messages.ByteBufferMessageSink.putShort (short s)`

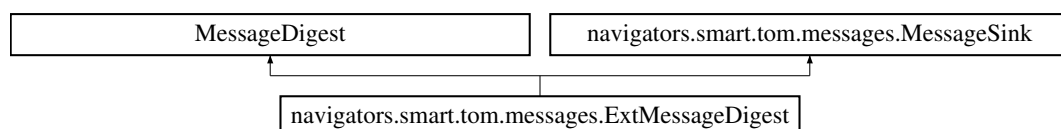
Implements [navigators.smart.tom.messages.MessageSink](#).

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

- `modular-smart/src/navigators/smart/tom/messages/ByteBufferMessageSink.java`

5.198 navigators.smart.tom.messages.ExtMessageDigest Class Reference

Inheritance diagram for `navigators.smart.tom.messages.ExtMessageDigest`:



Public Member Functions

- [ExtMessageDigest](#) ([MessageDigest](#) digest)
- [MessageSink](#) put (byte b)
- [MessageSink](#) put (byte[] src)
- [MessageSink](#) put (byte[] src, int offset, int length)
- [MessageSink](#) put ([ByteBuffer](#) src)
- [MessageSink](#) putChar (char c)
- [MessageSink](#) putDouble (double d)
- [MessageSink](#) putFloat (float f)
- [MessageSink](#) putInt (int i)
- [MessageSink](#) putLong (long l)
- [MessageSink](#) putShort (short s)
- [MessageSink](#) putPart ([MessagePart](#) part)
- [ExtMessageDigest](#) clone ()
- [ExtMessageDigest](#) createNew ()

Protected Member Functions

- byte[] [engineDigest](#) ()
- void [engineReset](#) ()
- void [engineUpdate](#) (byte input)
- void [engineUpdate](#) (byte[] input, int offset, int len)

5.198.1 Constructor & Destructor Documentation

5.198.1.1 [navigators.smart.tom.messages.ExtMessageDigest.ExtMessageDigest](#) ([MessageDigest](#) *digest*)

5.198.2 Member Function Documentation

5.198.2.1 **ExtMessageDigest** [navigators.smart.tom.messages.ExtMessageDigest.clone](#) ()

5.198.2.2 **ExtMessageDigest** [navigators.smart.tom.messages.ExtMessageDigest.createNew](#) ()

5.198.2.3 byte [] [navigators.smart.tom.messages.ExtMessageDigest.engineDigest](#) () [protected]

5.198.2.4 void [navigators.smart.tom.messages.ExtMessageDigest.engineReset](#) () [protected]

5.198.2.5 void [navigators.smart.tom.messages.ExtMessageDigest.engineUpdate](#) (byte *input*) [protected]

5.198.2.6 void [navigators.smart.tom.messages.ExtMessageDigest.engineUpdate](#) (byte[] *input*, int *offset*, int *len*) [protected]

5.198.2.7 **MessageSink** [navigators.smart.tom.messages.ExtMessageDigest.put](#) (byte *b*)

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.8 **MessageSink** [navigators.smart.tom.messages.ExtMessageDigest.put](#) (byte[] *src*)

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.9 **MessageSink** [navigators.smart.tom.messages.ExtMessageDigest.put](#) (byte[] *src*, int *offset*, int *length*)

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.10 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.put (ByteBuffer src)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.11 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putChar (char c)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.12 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putDouble (double d)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.13 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putFloat (float f)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.14 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putInt (int i)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.15 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putLong (long l)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.16 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putPart (MessagePart part)`

Implements [navigators.smart.tom.messages.MessageSink](#).

5.198.2.17 **MessageSink** `navigators.smart.tom.messages.ExtMessageDigest.putShort (short s)`

Implements [navigators.smart.tom.messages.MessageSink](#).

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

- `modular-smart/src/navigators/smart/tom/messages/ExtMessageDigest.java`

5.199 navigators.smart.tom.messages.MessageBuilder Class Reference

Public Member Functions

- void [initMessagePart](#) ([MessagePart](#) part)
- void [addHashTask](#) ([Hashable](#) task)
- void [finishedMessage](#) ([SmartMessage](#) msg)

5.199.1 Member Function Documentation

5.199.1.1 void `navigators.smart.tom.messages.MessageBuilder.addHashTask (Hashable task)`

5.199.1.2 void `navigators.smart.tom.messages.MessageBuilder.finishedMessage (SmartMessage msg)`

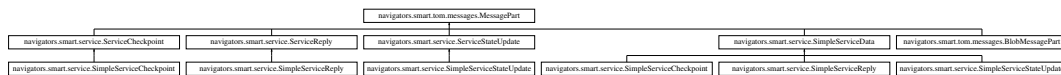
5.199.1.3 void navigators.smart.tom.messages.MessageBuilder.initMessagePart (MessagePart part)

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

- modular-smart/src/navigators/smart/tom/messages/MessageBuilder.java

5.200 navigators.smart.tom.messages.MessagePart Interface Reference

Inheritance diagram for navigators.smart.tom.messages.MessagePart:



Public Member Functions

- void [initHashTasks](#) (HasherPool< [Hashable](#) > hasherpool)
- [MessageSink](#) [writeTo](#) ([MessageSink](#) sink)
- [ExtMessageDigest](#) [updateHash](#) ([ExtMessageDigest](#) digest)
- int [getSize](#) ()

5.200.1 Member Function Documentation

5.200.1.1 int navigators.smart.tom.messages.MessagePart.getSize ()

Implemented in [navigators.smart.tom.messages.BlobMessagePart](#), and [navigators.smart.service.SimpleServiceData](#).

5.200.1.2 void navigators.smart.tom.messages.MessagePart.initHashTasks (HasherPool< Hashable > hasherpool)

Implemented in [navigators.smart.tom.messages.BlobMessagePart](#), and [navigators.smart.service.SimpleServiceData](#).

5.200.1.3 ExtMessageDigest navigators.smart.tom.messages.MessagePart.updateHash (ExtMessageDigest digest)

Implemented in [navigators.smart.tom.messages.BlobMessagePart](#), and [navigators.smart.service.SimpleServiceData](#).

5.200.1.4 MessageSink navigators.smart.tom.messages.MessagePart.writeTo (MessageSink sink)

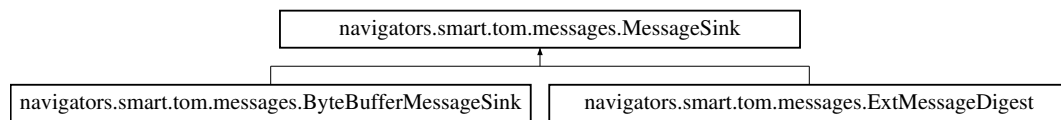
Implemented in [navigators.smart.tom.messages.BlobMessagePart](#), and [navigators.smart.service.SimpleServiceData](#).

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

- modular-smart/src/navigators/smart/tom/messages/MessagePart.java

5.201 navigators.smart.tom.messages.MessageSink Interface Reference

Inheritance diagram for navigators.smart.tom.messages.MessageSink:



Public Member Functions

- [MessageSink put](#) (byte *b*)
- [MessageSink put](#) (byte[] *src*)
- [MessageSink put](#) (byte[] *src*, int *offset*, int *length*)
- [MessageSink put](#) (ByteBuffer *src*)
- [MessageSink putChar](#) (char *c*)
- [MessageSink putDouble](#) (double *d*)
- [MessageSink putFloat](#) (float *f*)
- [MessageSink putInt](#) (int *i*)
- [MessageSink putLong](#) (long *l*)
- [MessageSink putShort](#) (short *s*)
- [MessageSink putPart](#) (MessagePart *part*)

5.201.1 Member Function Documentation

5.201.1.1 MessageSink navigators.smart.tom.messages.MessageSink.put (byte *b*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.2 MessageSink navigators.smart.tom.messages.MessageSink.put (byte[] *src*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.3 MessageSink navigators.smart.tom.messages.MessageSink.put (byte[] *src*, int *offset*, int *length*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.4 MessageSink navigators.smart.tom.messages.MessageSink.put (ByteBuffer *src*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.5 MessageSink navigators.smart.tom.messages.MessageSink.putChar (char *c*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.6 MessageSink navigators.smart.tom.messages.MessageSink.putDouble (double *d*)

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.-ExtMessageDigest](#).

5.201.1.7 MessageSink `navigators.smart.tom.messages.MessageSink.putFloat (float f)`

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.ExtMessageDigest](#).

5.201.1.8 MessageSink `navigators.smart.tom.messages.MessageSink.putInt (int i)`

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.ExtMessageDigest](#).

5.201.1.9 MessageSink `navigators.smart.tom.messages.MessageSink.putLong (long l)`

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.ExtMessageDigest](#).

5.201.1.10 MessageSink `navigators.smart.tom.messages.MessageSink.putPart (MessagePart part)`

Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.ExtMessageDigest](#).

5.201.1.11 MessageSink `navigators.smart.tom.messages.MessageSink.putShort (short s)`

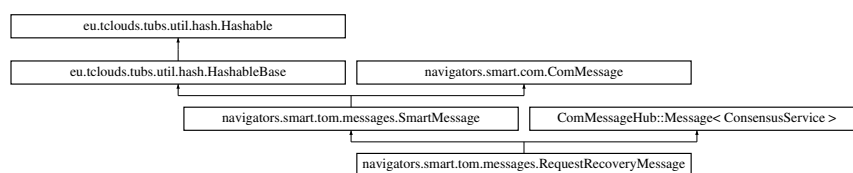
Implemented in [navigators.smart.tom.messages.ByteBufferMessageSink](#), and [navigators.smart.tom.messages.ExtMessageDigest](#).

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

- modular-smart/src/navigators/smart/tom/messages/MessageSink.java

5.202 navigators.smart.tom.messages.RequestRecoveryMessage Class Reference

Inheritance diagram for `navigators.smart.tom.messages.RequestRecoveryMessage`:

**Public Member Functions**

- [RequestRecoveryMessage](#) (ByteBuffer in) throws IOException, ClassNotFoundException
- [RequestRecoveryMessage](#) (byte[] hash, int from)
- [RequestRecoveryMessage](#) (TOMMessage msg, int from)
- [RequestRecoveryMessage](#) (byte[] hash, int from, int consId)
- void [process](#) (ConsensusService service)
- int [getConsId](#) ()
- int [getId](#) ()
- TOMMessage [getMsg](#) ()
- byte[] [getHash](#) ()
- String [toString](#) ()
- int [getPayloadSize](#) ()

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

5.202.1 Detailed Description

This class represents a message used when recovering requests

5.202.2 Constructor & Destructor Documentation

- 5.202.2.1 `navigators.smart.tom.messages.RequestRecoveryMessage.RequestRecoveryMessage (ByteBuffer in)` throws `IOException`, `ClassNotFoundException`

Creates a new instance of `RecoveryRequestMessage`

- 5.202.2.2 `navigators.smart.tom.messages.RequestRecoveryMessage.RequestRecoveryMessage (byte[] hash, int from)`

Creates a new instance of `RecoveryRequestMessage`, of the `RR_REQUEST` type

Parameters

<i>hash</i>	Hash of the request being recovered
<i>from</i>	ID of the process which sent the message

- 5.202.2.3 `navigators.smart.tom.messages.RequestRecoveryMessage.RequestRecoveryMessage (TOMMessage msg, int from)`

Creates a new instance of `RecoveryRequestMessage`, of the `RR_REPLY` type

Parameters

<i>msg</i>	TOM message containing the request being recovered
<i>from</i>	ID of the process which sent the message

- 5.202.2.4 `navigators.smart.tom.messages.RequestRecoveryMessage.RequestRecoveryMessage (byte[] hash, int from, int consId)`

Creates a new instance of `RecoveryRequestMessage`, of the `RR_DELIVERED` type

Parameters

<i>hash</i>	Hash of the request being recovered
<i>from</i>	ID of the process which sent the message
<i>consId</i>	Consensus's ID to which the request recover refers to

5.202.3 Member Function Documentation

- 5.202.3.1 `int navigators.smart.tom.messages.RequestRecoveryMessage.getConsId ()`

Retrieves the consensus's ID to which the request recover refers to

Returns

The consensus's ID to which the request recover refers to

5.202.3.2 `byte [] navigators.smart.tom.messages.RequestRecoveryMessage.getHash ()`

Retrieves the hash of the request being recovered. If there is no hash the length is 0

Returns

The hash of the request being recovered

Implements [eu.tclouds.tubs.util.hash.Hashable](#).

5.202.3.3 `int navigators.smart.tom.messages.RequestRecoveryMessage.getId ()`

Retrieves the message type (RR_REQUEST, RR_REPLY, RR_DELIVERED)

Returns

The message type (RR_REQUEST, RR_REPLY, RR_DELIVERED)

5.202.3.4 `TOMMessage navigators.smart.tom.messages.RequestRecoveryMessage.getMsg ()`

Retrieves the TOM message containing the request being recovered

Returns

The TOM message containing the request being recovered

5.202.3.5 `int navigators.smart.tom.messages.RequestRecoveryMessage.getPayloadSize ()`

5.202.3.6 `void navigators.smart.tom.messages.RequestRecoveryMessage.process (ConsensusService service)`

5.202.3.7 `String navigators.smart.tom.messages.RequestRecoveryMessage.toString ()`

5.202.3.8 `void navigators.smart.tom.messages.RequestRecoveryMessage.writePayloadTo (MessageSink sink) [protected]`

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

- modular-smart/src/navigators/smart/tom/messages/RequestRecoveryMessage.java

5.203 navigators.smart.tom.messages.SmartMessage Class Reference

Inheritance diagram for navigators.smart.tom.messages.SmartMessage:



Public Member Functions

- [SmartMessage](#) (byte typeid, int sender)
- final int [getSenderID](#) ()
- final byte [getTypeID](#) ()
- String [toString](#) ()
- String [getTypeName](#) ()
- void [writeBodyTo](#) (ByteBuffer out)
- final int [getBodySize](#) ()

Protected Member Functions

- [SmartMessage](#) (byte typeid, ByteBuffer in)
- byte[] [doCalcHash](#) (MessageDigest digest)
- void [writePayloadTo](#) (MessageSink sink)
- void [writeCertificateTo](#) (MessageSink sink)
- int [getPayloadSize](#) ()
- int [getCertificateSize](#) ()

5.203.1 Detailed Description

This is the super-class for all other kinds of messages created by JBP

5.203.2 Constructor & Destructor Documentation

5.203.2.1 `navigators.smart.tom.messages.SmartMessage.SmartMessage (byte typeid, ByteBuffer in)` [protected]

Creates a new instance of SystemMessage

Parameters

<i>type</i>	The type id of this message
<i>in</i>	The inputstream containing the serialised object

5.203.2.2 `navigators.smart.tom.messages.SmartMessage.SmartMessage (byte typeid, int sender)`

Creates a new instance of SystemMessage

Parameters

<i>type</i>	The type id of this message for preformant serialisation
<i>sender</i>	ID of the process which sent the message

5.203.3 Member Function Documentation

5.203.3.1 `byte [] navigators.smart.tom.messages.SmartMessage.doCalcHash (MessageDigest digest)` [protected],
[virtual]

this method serialises the contents of this class

Parameters

<i>out</i>	
------------	--

Implements [eu.tclouds.tubs.util.hash.HashableBase](#).

5.203.3.2 `final int navigators.smart.tom.messages.SmartMessage.getBodySize ()`

Returns the messageSize in Bytes that the serialised version of this msg will use.

Returns

The messagesize in bytes

Implements [navigators.smart.com.ComMessage](#).

5.203.3.3 `int navigators.smart.tom.messages.SmartMessage.getCertificateSize ()` [protected]

5.203.3.4 `int navigators.smart.tom.messages.SmartMessage.getPayloadSize ()` [protected]

5.203.3.5 `final int navigators.smart.tom.messages.SmartMessage.getSenderID ()`

Returns the ID of the process which sent the message

Returns

Implements [navigators.smart.com.ComMessage](#).

5.203.3.6 `final byte navigators.smart.tom.messages.SmartMessage.getTypeID ()`

Implements [navigators.smart.com.ComMessage](#).

5.203.3.7 `String navigators.smart.tom.messages.SmartMessage.getTypeName ()`

5.203.3.8 `String navigators.smart.tom.messages.SmartMessage.toString ()`

5.203.3.9 `void navigators.smart.tom.messages.SmartMessage.writeBodyTo (ByteBuffer out)`

Implements [navigators.smart.com.ComMessage](#).

5.203.3.10 `void navigators.smart.tom.messages.SmartMessage.writeCertificateTo (MessageSink sink)` [protected]

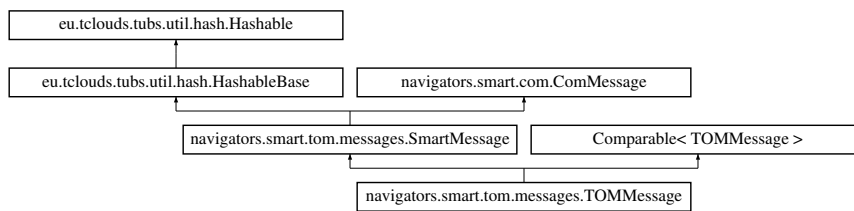
5.203.3.11 `void navigators.smart.tom.messages.SmartMessage.writePayloadTo (MessageSink sink)` [protected]

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

- modular-smart/src/navigators/smart/tom/messages/SmartMessage.java

5.204 navigators.smart.tom.messages.TOMMessage Class Reference

Inheritance diagram for navigators.smart.tom.messages.TOMMessage:



Public Member Functions

- [TOMMessage](#) (int sender, int sequence, byte[] content)
- [TOMMessage](#) (int sender, int sequence, byte[] content, boolean readOnlyRequest)
- [TOMMessage](#) (int sender, int sequence, byte[] content, boolean readOnlyRequest, boolean ishash)
- synchronized byte[] [getBytes](#) ()
- [DebugInfo](#) [getDebugInfo](#) ()
- void [setSequence](#) ([DebugInfo](#) info)
- int [getSequence](#) ()
- int [getId](#) ()
- byte[] [getContent](#) ()
- boolean [isReadOnlyRequest](#) ()
- boolean [isHash](#) ()
- boolean [equals](#) (Object o)
- int [hashCode](#) ()
- String [toString](#) ()
- int [getPayloadSize](#) ()
- int [compareTo](#) ([TOMMessage](#) tm)

Static Public Member Functions

- static [TOMMessage](#) [readFrom](#) (ByteBuffer in)
- static int [getSenderFromId](#) (int id)

Public Attributes

- transient long [timestamp](#) = 0
- transient byte[] [nonces](#) = null
- transient int [destination](#) = -1
- transient boolean [signed](#) = false
- transient long [receptionTime](#)
- transient boolean [timeout](#) = false
- transient byte[] [serializedMessageSignature](#) = null
- transient byte[] [serializedMessageMAC](#) = null
- transient long [consensusStartTime](#) =0
- transient long [consensusExecutionTime](#) =0
- transient int [consensusBatchSize](#) =0
- transient long [requestTotalLatency](#) =0

Protected Member Functions

- [TOMMessage](#) (ByteBuffer in)
- void [writePayloadTo](#) ([MessageSink](#) sink)

5.204.1 Detailed Description

This class represents a total ordered message

5.204.2 Constructor & Destructor Documentation

5.204.2.1 `navigators.smart.tom.messages.TOMMessage.TOMMessage (ByteBuffer in)` [protected]

5.204.2.2 `navigators.smart.tom.messages.TOMMessage.TOMMessage (int sender, int sequence, byte[] content)`

Creates a new instance of [TOMMessage](#)

Parameters

<i>sender</i>	ID of the process which sent the message
<i>sequence</i>	Sequence number defined by the client
<i>content</i>	Content of the message

5.204.2.3 `navigators.smart.tom.messages.TOMMessage.TOMMessage (int sender, int sequence, byte[] content, boolean readOnlyRequest)`

Creates a new instance of [TOMMessage](#)

Parameters

<i>sender</i>	ID of the process which sent the message
<i>sequence</i>	Sequence number defined by the client
<i>content</i>	Content of the message
<i>readOnly-Request</i>	it is a read only request

5.204.2.4 `navigators.smart.tom.messages.TOMMessage.TOMMessage (int sender, int sequence, byte[] content, boolean readOnlyRequest, boolean ishash)`

5.204.3 Member Function Documentation

5.204.3.1 `int navigators.smart.tom.messages.TOMMessage.compareTo (TOMMessage tm)`

5.204.3.2 `boolean navigators.smart.tom.messages.TOMMessage.equals (Object o)`

Verifies if two [TOMMessage](#) objects are equal.

Two [TOMMessage](#) are equal if they have the same sender, sequence number and content.

5.204.3.3 `synchronized byte [] navigators.smart.tom.messages.TOMMessage.getBytes ()`

5.204.3.4 `byte [] navigators.smart.tom.messages.TOMMessage.getContent ()`

Retrieves the content of the message

Returns

The content of the message

5.204.3.5 `DebugInfo navigators.smart.tom.messages.TOMMessage.getDebugInfo ()`

Retrieves the debug info from the TOM layer

Returns

The debug info from the TOM layer

5.204.3.6 `int navigators.smart.tom.messages.TOMMessage.getId ()`

Retrieves the ID for this message. It should be unique

Returns

The ID for this message.

5.204.3.7 `int navigators.smart.tom.messages.TOMMessage.getPayloadSize ()`

5.204.3.8 `static int navigators.smart.tom.messages.TOMMessage.getSenderFromId (int id) [static]`

Retrieves the process ID of the sender given a message ID

Parameters

<i>id</i>	Message ID
-----------	------------

Returns

Process ID of the sender

5.204.3.9 `int navigators.smart.tom.messages.TOMMessage.getSequence ()`

Retrieves the sequence number defined by the client

Returns

The sequence number defined by the client

5.204.3.10 `int navigators.smart.tom.messages.TOMMessage.hashCode ()`

5.204.3.11 `boolean navigators.smart.tom.messages.TOMMessage.isHash ()`

5.204.3.12 `boolean navigators.smart.tom.messages.TOMMessage.isReadOnlyRequest ()`

Returns

the readOnlyRequest

5.204.3.13 static **TOMMessage** navigators.smart.tom.messages.TOMMessage.readFrom (*ByteBuffer in*) [static]

5.204.3.14 void navigators.smart.tom.messages.TOMMessage.setSequence (*DebugInfo info*)

Retrieves the debug info from the TOM layer

Returns

The debug info from the TOM layer

5.204.3.15 String navigators.smart.tom.messages.TOMMessage.toString ()

5.204.3.16 void navigators.smart.tom.messages.TOMMessage.writePayloadTo (*MessageSink sink*) [protected]

5.204.4 Member Data Documentation

5.204.4.1 transient int navigators.smart.tom.messages.TOMMessage.consensusBatchSize =0

5.204.4.2 transient long navigators.smart.tom.messages.TOMMessage.consensusExecutionTime =0

5.204.4.3 transient long navigators.smart.tom.messages.TOMMessage.consensusStartTime =0

5.204.4.4 transient int navigators.smart.tom.messages.TOMMessage.destination = -1

5.204.4.5 transient byte [] navigators.smart.tom.messages.TOMMessage.nonces = null

5.204.4.6 transient long navigators.smart.tom.messages.TOMMessage.receptionTime

5.204.4.7 transient long navigators.smart.tom.messages.TOMMessage.requestTotalLatency =0

5.204.4.8 transient byte [] navigators.smart.tom.messages.TOMMessage.serializedMessageMAC = null

5.204.4.9 transient byte [] navigators.smart.tom.messages.TOMMessage.serializedMessageSignature = null

5.204.4.10 transient boolean navigators.smart.tom.messages.TOMMessage.signed = false

5.204.4.11 transient boolean navigators.smart.tom.messages.TOMMessage.timeout = false

5.204.4.12 transient long navigators.smart.tom.messages.TOMMessage.timestamp = 0

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

- modular-smart/src/navigators/smart/tom/messages/TOMMessage.java

5.205 navigators.smart.tom.RequestRecover Class Reference

Public Member Functions

- [RequestRecover](#) ([TOMLayer](#) tomLayer, [TOMConfiguration](#) conf, [ComMessageHub](#)< [PaxosAtWarService](#) > com)

- void [recover](#) (byte[] hash)
- void [receive](#) ([TOMMessage](#) msg, byte[] msgHash)
- [TOMMessage](#) [getMsg](#) ()

5.205.1 Detailed Description

TODO: Isto vai desaparecer?

5.205.2 Constructor & Destructor Documentation

- 5.205.2.1 `navigators.smart.tom.RequestRecover.RequestRecover (TOMLayer tomLayer, TOMConfiguration conf, ComMessageHub< PaxosAtWarService > com)`

Creates a new instance of [RequestRecover](#)

5.205.3 Member Function Documentation

- 5.205.3.1 `TOMMessage navigators.smart.tom.RequestRecover.getMsg ()`

- 5.205.3.2 `void navigators.smart.tom.RequestRecover.receive (TOMMessage msg, byte[] msgHash)`

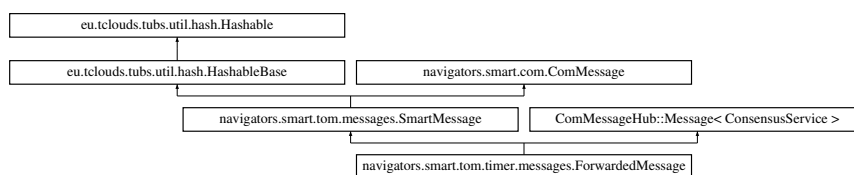
- 5.205.3.3 `void navigators.smart.tom.RequestRecover.recover (byte[] hash)`

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

- modular-smart/src/navigators/smart/tom/RequestRecover.java

5.206 navigators.smart.tom.timer.messages.ForwardedMessage Class Reference

Inheritance diagram for `navigators.smart.tom.timer.messages.ForwardedMessage`:



Public Member Functions

- [ForwardedMessage](#) (ByteBuffer in) throws IOException, ClassNotFoundException
- [ForwardedMessage](#) (int senderId, [TOMMessage](#) request)
- void [process](#) ([ConsensusService](#) service)
- [TOMMessage](#) [getRequest](#) ()
- int [getPayloadSize](#) ()

Protected Member Functions

- void [writePayloadTo](#) ([MessageSink](#) sink)

5.206.1 Detailed Description

Message used to forward a client request to the current leader when the first timeout for this request is triggered (see RequestTimer).

5.206.2 Constructor & Destructor Documentation

5.206.2.1 `navigators.smart.tom.timer.messages.ForwardedMessage.ForwardedMessage (ByteBuffer in)` throws `IOException`, `ClassNotFoundException`

5.206.2.2 `navigators.smart.tom.timer.messages.ForwardedMessage.ForwardedMessage (int senderId, TOMMessage request)`

5.206.3 Member Function Documentation

5.206.3.1 `int navigators.smart.tom.timer.messages.ForwardedMessage.getPayloadSize ()`

5.206.3.2 `TOMMessage navigators.smart.tom.timer.messages.ForwardedMessage.getRequest ()`

5.206.3.3 `void navigators.smart.tom.timer.messages.ForwardedMessage.process (ConsensusService service)`

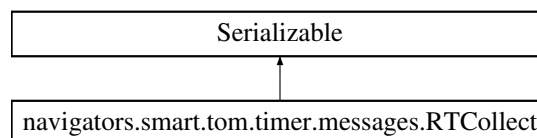
5.206.3.4 `void navigators.smart.tom.timer.messages.ForwardedMessage.writePayloadTo (MessageSink sink)`
[protected]

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

- `modular-smart/src/navigators/smart/tom/timer/messages/ForwardedMessage.java`

5.207 navigators.smart.tom.timer.messages.RTCollect Class Reference

Inheritance diagram for `navigators.smart.tom.timer.messages.RTCollect`:



Public Member Functions

- [RTCollect](#) (int newLeader, long lastConsensus, int reqId)
- int [getNewLeader](#) ()
- int [getReqId](#) ()
- long [getLastConsensus](#) ()

5.207.1 Detailed Description

This class represents a proof sent by a replica to the leader for the consensus being started

5.207.2 Constructor & Destructor Documentation

5.207.2.1 `navigators.smart.tom.timer.messages.RTCollect.RTCollect (int newLeader, long lastConsensus, int reqId)`

Creates a new instance of TimerRequestCollect

Parameters

<i>newLeader</i>	New leader for the next consensus being started
<i>lastConsensus</i>	Last consensus executed, or being executed
<i>reqId</i>	Request ID associated with the timeout

5.207.3 Member Function Documentation

5.207.3.1 `long navigators.smart.tom.timer.messages.RTCollect.getLastConsensus ()`

Retrieves the last consensus executed, or being executed

Returns

The last consensus executed, or being executed

5.207.3.2 `int navigators.smart.tom.timer.messages.RTCollect.getNewLeader ()`

Retrieves the new leader for the next consensus being started

Returns

The new leader for the next consensus being started

5.207.3.3 `int navigators.smart.tom.timer.messages.RTCollect.getReqId ()`

Retrieves the request ID associated with the timeout

Returns

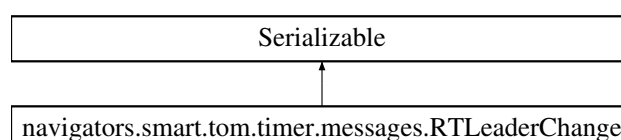
The request ID associated with the timeout

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

- modular-smart/src/navigators/smart/tom/timer/messages/RTCollect.java

5.208 `navigators.smart.tom.timer.messages.RTLeaderChange` Class Reference

Inheritance diagram for `navigators.smart.tom.timer.messages.RTLeaderChange`:



Public Member Functions

- [RTLeaderChange](#) (SignedObject[] [proof](#), int [nl](#), long [start](#))
- boolean [isAGoodStartLeader](#) (RTCollect[] [collect](#), int [f](#))

Public Attributes

- SignedObject[] [proof](#)
- int [newLeader](#)
- long [start](#)

5.208.1 Detailed Description

This class serves as placeholder for the proofs of a RT leader change

5.208.2 Constructor & Destructor Documentation

5.208.2.1 `navigators.smart.tom.timer.messages.RTLeaderChange.RTLeaderChange (SignedObject[] proof, int nl, long start)`

Creates a new instance of RTLeaderChangeMessage

Parameters

<i>proof</i>	Proofs for the new leader
<i>nl</i>	Replica ID of the new leader
<i>start</i>	ID of the consensus to be started

5.208.3 Member Function Documentation

5.208.3.1 `boolean navigators.smart.tom.timer.messages.RTLeaderChange.isAGoodStartLeader (RTCollect[] collect, int f)`

Checks if the new leader for the consensus being started is valid according to an array of [RTCollect](#) proofs

Parameters

<i>collect</i>	RTCoollect proofs that can confirm (or not) that newLeader is valid for the consensus being started
<i>f</i>	MAXimum number of faulty replicas that can exist

Returns

True if newLeader is valid, false otherwise

5.208.4 Member Data Documentation

5.208.4.1 `int navigators.smart.tom.timer.messages.RTLeaderChange.newLeader`

5.208.4.2 `SignedObject [] navigators.smart.tom.timer.messages.RTLeaderChange.proof`

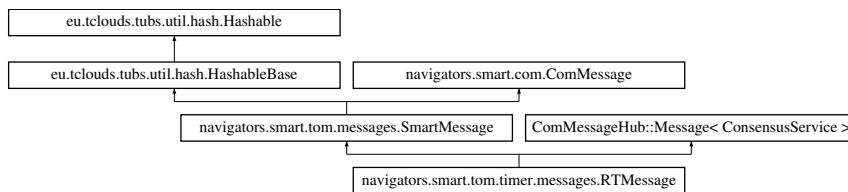
5.208.4.3 `long navigators.smart.tom.timer.messages.RTLeaderChange.start`

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

- modular-smart/src/navigators/smart/tom/timer/messages/RTLeaderChange.java

5.209 navigators.smart.tom.timer.messages.RTMessage Class Reference

Inheritance diagram for navigators.smart.tom.timer.messages.RTMessage:



Public Member Functions

- [RTMessage](#) (ByteBuffer in) throws IOException, ClassNotFoundException
- [RTMessage](#) (int rtType, int reqId, int from, Object content)
- void [process](#) (ConsensusService service)
- int [getRTType](#) ()
- int [getReqId](#) ()
- Object [getContent](#) ()
- int [getPayloadSize](#) ()

Protected Member Functions

- void [writePayloadTo](#) (MessageSink sink)

5.209.1 Detailed Description

This class represents a message used in the TO-FREEZE phase

5.209.2 Constructor & Destructor Documentation

5.209.2.1 `navigators.smart.tom.timer.messages.RTMessage.RTMessage (ByteBuffer in)` throws IOException, ClassNotFoundException

Creates a new instance of RequestTimeoutMessage

Parameters

<i>in</i>	The stream containing the data to create this object
-----------	--

Exceptions

<i>IOException</i>	
<i>ClassNotFoundException</i>	

5.209.2.2 `navigators.smart.tom.timer.messages.RTMessage.RTMessage (int rtType, int reqId, int from, Object content)`

Creates a new instance of RequestTimeoutMessage

Parameters

<i>rtType</i>	Message type (RT_TIMEOUT, RT_COLLECT, RT_LEADER)
<i>reqId</i>	Request ID associated with the timeout
<i>from</i>	Replica ID of the sender
<i>content</i>	Content of this message. Varies according to the message type

5.209.3 Member Function Documentation

5.209.3.1 Object navigators.smart.tom.timer.messages.RTMessage.getContent ()

Retrieves the content of this message

Returns

The content of this message

5.209.3.2 int navigators.smart.tom.timer.messages.RTMessage.getPayloadSize ()

5.209.3.3 int navigators.smart.tom.timer.messages.RTMessage.getReqId ()

Retrieves the request ID associated with the timeout

Returns

The request ID associated with the timeout

5.209.3.4 int navigators.smart.tom.timer.messages.RTMessage.getRTType ()

Retrieves the message type

Returns

The message type

5.209.3.5 void navigators.smart.tom.timer.messages.RTMessage.process (ConsensusService service)

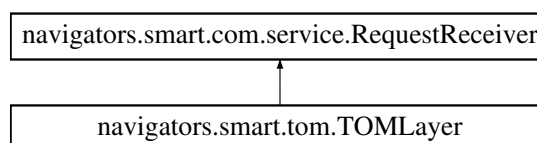
5.209.3.6 void navigators.smart.tom.timer.messages.RTMessage.writePayloadTo (MessageSink sink) [protected]

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

- modular-smart/src/navigators/smart/tom/timer/messages/RTMessage.java

5.210 navigators.smart.tom.TOMLayer Class Reference

Inheritance diagram for navigators.smart.tom.TOMLayer:



Public Member Functions

- [TOMLayer](#) ([ServiceReplica](#) service, [TOMConfiguration](#) conf) throws [ConfigurationException](#)
- [ServiceReplica](#) [getServiceReplica](#) ()
- void [start](#) () throws [IOException](#), [InterruptedException](#)
- [TOMConfiguration](#) [getConf](#) ()
- final byte[] [computeHash](#) (byte[] data)
- [SystemCommunication](#) [getSystemCom](#) ()
- void [sendToClient](#) (int clientid, [TOMMessage](#) msg)
- void [receivedRequest](#) ([TOMMessage](#) msg) throws [InterruptedException](#)
- byte[] [createPropose](#) ()
- void [decided](#) ([Consensus](#)< [TOMMessage](#)[] > cons)
- [TOMMessage](#)[] [checkProposedValue](#) (byte[] proposedValue) throws [IOException](#)
- void [notifyRequestExecuted](#) ([ServiceResult](#) res)
- void [consensusDelivered](#) ([Consensus](#)<?> cons)
- void [createCheckpoint](#) ([Consensus](#)<?> cons, [ServiceCheckpoint](#) scp)
- void [saveState](#) (long lastEid, int decisionRound, int leader, byte[] lstate, [ServiceCheckpoint](#) scp)
- void [saveBatch](#) (byte[] batch, long lastEid, int decisionRound, int leader)
- void [requestStateTransfer](#) (int me, List< Integer > otherAcceptors, int sender, long eid)
- void [SMRequestDeliver](#) ([SMMessage](#) msg)
- void [SMReplyDeliver](#) ([SMMessage](#) msg)
- boolean [isRetrievingState](#) ()
- [ConsensusService](#) [getConsensusService](#) ()
- boolean [hasPendingRequests](#) ()

Public Attributes

- [ClientsManager](#) [clientsManager](#)

Package Attributes

- int [currentProtocol](#)

5.210.1 Detailed Description

This class implements a thread that uses the PaW algorithm to provide the application a layer of total ordered messages

TODO There is a bug when we request a statetransfer for eid 0 -> statemanager.waiting is set to -1 then which means we are not waiting for a state

5.210.2 Constructor & Destructor Documentation

5.210.2.1 [navigators.smart.tom.TOMLayer.TOMLayer](#) ([ServiceReplica](#) service, [TOMConfiguration](#) conf) throws [ConfigurationException](#)

Creates a new instance of [TOMulticastLayer](#)

Parameters

<i>receiver</i>	Object that receives requests from clients
<i>conf</i>	TOM configuration

Exceptions

<i>InvocationTargetException</i>	
<i>IllegalAccessException</i>	
<i>InstantiationException</i>	
<i>SecurityException</i>	

ISTO E CODIGO DO JOAO, PARA TRATAR DOS CHECKPOINTS E TRANSFERENCIA DE ESTADO

5.210.3 Member Function Documentation

5.210.3.1 **TOMMessage []** navigators.smart.tom.TOMLayer.checkProposedValue (**byte[]** *proposedValue*) throws **IOException**

Verify if the value being proposed for a round is valid. It verifies the client signature of all batch requests.

TODO: verify timestamps and nonces

Parameters

<i>round</i>	the Round for which this value is being proposed
<i>proposedValue</i>	the value being proposed

Returns

5.210.3.2 **final byte []** navigators.smart.tom.TOMLayer.computeHash (**byte[]** *data*)

Computes an hash for a TOM message

Parameters

<i>message</i>	
----------------	--

Returns

Hash for teh specified TOM message

5.210.3.3 **void** navigators.smart.tom.TOMLayer.consensusDelivered (**Consensus<?>** *cons*)

5.210.3.4 **void** navigators.smart.tom.TOMLayer.createCheckpoint (**Consensus<?>** *cons*, **ServiceCheckpoint** *scp*)

5.210.3.5 **byte []** navigators.smart.tom.TOMLayer.createPropose ()

Creates a value to be proposed to the acceptors. Invoked if this replica is the leader

Returns

A value to be proposed to the acceptors or null if there are no pending request

5.210.3.6 **void** navigators.smart.tom.TOMLayer.decided (**Consensus< TOMMessage[]>** *cons*)

Called by the current consensus's execution, to notify the TOM layer that a value was decided

Parameters

<i>cons</i>	The decided consensus
-------------	-----------------------

5.210.3.7 **TOMConfiguration** `navigators.smart.tom.TOMLayer.getConf ()`

Retrieve TOM configuration

Returns

TOM configuration

5.210.3.8 **ConsensusService** `navigators.smart.tom.TOMLayer.getConsensusService ()`5.210.3.9 **ServiceReplica** `navigators.smart.tom.TOMLayer.getServiceReplica ()`5.210.3.10 **SystemCommunication** `navigators.smart.tom.TOMLayer.getSystemCom ()`

Retrieve Communication system between replicas

Returns

Communication system between replicas

5.210.3.11 **boolean** `navigators.smart.tom.TOMLayer.hasPendingRequests ()`5.210.3.12 **boolean** `navigators.smart.tom.TOMLayer.isRetrievingState ()`5.210.3.13 **void** `navigators.smart.tom.TOMLayer.notifyRequestExecuted (ServiceResult res)`5.210.3.14 **void** `navigators.smart.tom.TOMLayer.requestReceived (TOMMessage msg)` throws `InterruptedException`

This method is invoked by the communication system to deliver a request. It assumes that the communication system delivers the message in FIFO order.

Parameters

<i>msg</i>	The request being received
------------	----------------------------

Implements [navigators.smart.com.service.RequestReceiver](#).

5.210.3.15 **void** `navigators.smart.tom.TOMLayer.requestStateTransfer (int me, List< Integer > otherAcceptors, int sender, long eid)`

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

5.210.3.16 **void** `navigators.smart.tom.TOMLayer.saveBatch (byte[] batch, long lastEid, int decisionRound, int leader)`5.210.3.17 **void** `navigators.smart.tom.TOMLayer.saveState (long lastEid, int decisionRound, int leader, byte[] lstate, ServiceCheckpoint scp)`

Saves the state to the statelog

Parameters

<i>lastEid</i>	The last executionid that is in this state
<i>decisionRound</i>	The round of the last execution in this state
<i>leader</i>	The leader of the last execution in this state
<i>lmstate</i>	The current state of the leadermodule

5.210.3.18 void navigators.smart.tom.TOMLayer.sendToClient (int *clientid*, TOMMessage *msg*)

5.210.3.19 void navigators.smart.tom.TOMLayer.SMReplyDeliver (SMMMessage *msg*)

5.210.3.20 void navigators.smart.tom.TOMLayer.SMRequestDeliver (SMMMessage *msg*)

CODIGO MALICIOSO, PARA FORCAR A REPLICA ATRASADA A PEDIR O ESTADO A OUTRA DAS REPLICAS
 * byte[] badState = {127}; if (sendState && conf.getProcessId() == 0) state.setState(badState); /

5.210.3.21 void navigators.smart.tom.TOMLayer.start () throws IOException, InterruptedException

5.210.4 Member Data Documentation

5.210.4.1 ClientsManager navigators.smart.tom.TOMLayer.clientsManager

Store requests received but still not ordered

5.210.4.2 int navigators.smart.tom.TOMLayer.currentProtocol [package]

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

- modular-smart/src/navigators/smart/tom/TOMLayer.java

5.211 navigators.smart.tom.TOMMessageHandler Class Reference

Public Member Functions

- TOMMessageHandler (TOMLayer *tomlayer*)
- void processData (SmartMessage *sm*)
- byte[] getData (SmartMessage *msg*)
- SmartMessage deserialise (byte *typeid*, ByteBuffer *buf*) throws IOException, ClassNotFoundException

5.211.1 Constructor & Destructor Documentation

5.211.1.1 navigators.smart.tom.TOMMessageHandler.TOMMessageHandler (TOMLayer *tomlayer*)

5.211.2 Member Function Documentation

5.211.2.1 SmartMessage navigators.smart.tom.TOMMessageHandler.deserialise (byte *typeid*, ByteBuffer *buf*) throws IOException, ClassNotFoundException

5.211.2.2 byte [] navigators.smart.tom.TOMMessageHandler.getData (SmartMessage *msg*)

5.211.2.3 void navigators.smart.tom.TOMMessageHandler.processData (SmartMessage sm)

ISTO E CODIGO DO JOAO, PARA TRATAR DA TRANSFERENCIA DE ESTADO

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

- modular-smart/src/navigators/smart/tom/TOMMessageHandler.java

5.212 navigators.smart.tom.util.BatchBuilder Class Reference

Public Member Functions

- byte[] [createBatch](#) (long timestamp, int numberOfNonces, int numberOfMessages, int totalMessagesSize, byte[][] messages, byte[][] signatures)

5.212.1 Detailed Description

Batch format: TIMESTAMP(long) + N_NONCES(int) + SEED(long) + N_MESSAGES(int) + N_MESSAGES*[MSG-SIZE(int),MSG(byte),SIG(byte)] +

The methods does not try to enforce any constraint, so be correct when using it.

5.212.2 Member Function Documentation

5.212.2.1 byte [] navigators.smart.tom.util.BatchBuilder.createBatch (long *timestamp*, int *numberOfNonces*, int *numberOfMessages*, int *totalMessagesSize*, byte *messages*[], byte *signatures*[])

build buffer

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

- modular-smart/src/navigators/smart/tom/util/BatchBuilder.java

5.213 navigators.smart.tom.util.BatchBuilderReaderTest Class Reference

Public Member Functions

- void [testCreateBatch](#) ()
- void [testCreateBatchWithSigs](#) ()

5.213.1 Member Function Documentation

5.213.1.1 void navigators.smart.tom.util.BatchBuilderReaderTest.testCreateBatch ()

5.213.1.2 void navigators.smart.tom.util.BatchBuilderReaderTest.testCreateBatchWithSigs ()

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

- modular-smart/test/navigators/smart/tom/util/BatchBuilderReaderTest.java

5.214 navigators.smart.tom.util.BatchReader Class Reference

Public Member Functions

- [BatchReader](#) (byte[] batch, boolean useSignatures, int signatureSize)
- [TOMMessage](#)[] [deserialiseRequests](#) ()

5.214.1 Detailed Description

Batch format: N_MESSAGES(int) + N_MESSAGES*[MSGSIZE(int),MSG(byte)] + TIMESTAMP(long) + N_NONCES(int) + NONCES(byte[])

5.214.2 Constructor & Destructor Documentation

5.214.2.1 `navigators.smart.tom.util.BatchReader.BatchReader (byte[] batch, boolean useSignatures, int signatureSize)`

Reads batches

Parameters

<i>batch</i>	The batch to read
<i>useSignatures</i>	Where signatures used
<i>signatureSize</i>	The size of the signatures used

5.214.3 Member Function Documentation

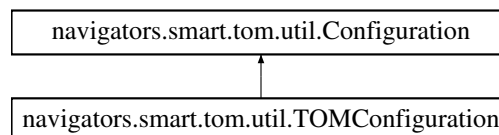
5.214.3.1 `TOMMessage [] navigators.smart.tom.util.BatchReader.deserialiseRequests ()`

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

- modular-smart/src/navigators/smart/tom/util/BatchReader.java

5.215 navigators.smart.tom.util.Configuration Class Reference

Inheritance diagram for navigators.smart.tom.util.Configuration:



Public Member Functions

- [Configuration](#) ([Configuration](#) conf, int [processId](#))
- [Configuration](#) (int proclId)
- [Configuration](#) (int [processId](#), String [configHome](#))
- [Configuration](#) (int [processId](#), String [configHome](#), String [hostsFileName](#))
- final boolean [isHostSetted](#) (int id)
- final boolean [useBlockingChannels](#) ()
- final int [getAutoConnectLimit](#) ()

- final boolean [useAuthentication](#) ()
- final BigInteger [getDHP](#) ()
- final BigInteger [getDHG](#) ()
- final String [getHmacAlgorithm](#) ()
- final int [getHmacSize](#) ()
- final String [getProperty](#) (String key)
- final Map< String, String > [getProperties](#) ()
- final InetAddress [getRemoteAddress](#) (int id)
- final InetAddress [getLocalAddress](#) (int id)
- final String [getServerHost](#) (int id)
- final int [getClientComPort](#) (int id)
- int [getProcessId](#) ()
- final void [setProcessId](#) (int processId)
- String[] [getConsensusAlgorithmFactory](#) ()
- int [getDefaultConsensusAlgorithmFactory](#) ()
- String [getPTPVerifierFactoryClassname](#) ()
- String [getGlobalMessageVerifierFactoryClassName](#) ()
- boolean [useGlobalAuth](#) ()

Static Public Member Functions

- static String [getHomeDir](#) ()

Protected Member Functions

- void [init](#) ()

Protected Attributes

- int [processId](#)
- boolean [authentication](#)
- boolean [channelsBlocking](#)
- BigInteger [DH_P](#)
- BigInteger [DH_G](#)
- int [autoConnectLimit](#)
- Map< String, String > [configs](#)
- [HostsConfig](#) [hosts](#)

Static Protected Attributes

- static String [configHome](#) = ""
- static String [hostsFileName](#) = ""

5.215.1 Constructor & Destructor Documentation

5.215.1.1 `navigators.smart.tom.util.Configuration.Configuration (Configuration conf, int processId)`

5.215.1.2 `navigators.smart.tom.util.Configuration.Configuration (int proclId)`

5.215.1.3 `navigators.smart.tom.util.Configuration.Configuration (int processId, String configHome)`

5.215.1.4 `navigators.smart.tom.util.Configuration.Configuration (int processId, String configHome, String hostsFileName)`

5.215.2 Member Function Documentation

5.215.2.1 `final int navigators.smart.tom.util.Configuration.getAutoConnectLimit ()`

5.215.2.2 `final int navigators.smart.tom.util.Configuration.getClientComPort (int id)`

5.215.2.3 `String [] navigators.smart.tom.util.Configuration.getConsensusAlgorithmFactory ()`

Returns the full class name of the class that shall be the Factory for the consensusalgorithm

Returns

The full name of the factory class

5.215.2.4 `int navigators.smart.tom.util.Configuration.getDefaultConsensusAlgorithmFactory ()`

Returns the full class name of the default class that shall be the Factory for the consensusalgorithm

Returns

The full name of the factory class

5.215.2.5 `final BigInteger navigators.smart.tom.util.Configuration.getDHG ()`

5.215.2.6 `final BigInteger navigators.smart.tom.util.Configuration.getDHP ()`

5.215.2.7 `String navigators.smart.tom.util.Configuration.getGlobalMessageVerifierFactoryClassName ()`

Returns the full class name of the Factory for global message verifiers

Returns

The full name of the factory class

5.215.2.8 `final String navigators.smart.tom.util.Configuration.getHmacAlgorithm ()`

5.215.2.9 `final int navigators.smart.tom.util.Configuration.getHmacSize ()`

5.215.2.10 `static String navigators.smart.tom.util.Configuration.getHomeDir () [static]`

5.215.2.11 `final InetAddress navigators.smart.tom.util.Configuration.getLocalAddress (int id)`

5.215.2.12 `int navigators.smart.tom.util.Configuration.getProcessID ()`

Returns the id of this smart instance

Returns

The id of this instance

5.215.2.13 `final Map<String,String> navigators.smart.tom.util.Configuration.getProperties ()`

5.215.2.14 `final String navigators.smart.tom.util.Configuration.getProperty (String key)`

5.215.2.15 `String navigators.smart.tom.util.Configuration.getPTPVerifierFactoryClassname ()`

Returns the full class name of the Factory for point-to-point message verifiers

Returns

The full name of the factory class

5.215.2.16 `final InetAddress navigators.smart.tom.util.Configuration.getRemoteAddress (int id)`

5.215.2.17 `final String navigators.smart.tom.util.Configuration.getServerHost (int id)`

5.215.2.18 `void navigators.smart.tom.util.Configuration.init ()` [protected]

5.215.2.19 `final boolean navigators.smart.tom.util.Configuration.isHostSetted (int id)`

5.215.2.20 `final void navigators.smart.tom.util.Configuration.setProcessId (int processId)`

5.215.2.21 `final boolean navigators.smart.tom.util.Configuration.useAuthentication ()`

5.215.2.22 `final boolean navigators.smart.tom.util.Configuration.useBlockingChannels ()`

5.215.2.23 `boolean navigators.smart.tom.util.Configuration.useGlobalAuth ()`

Indicates wheter global authentication such as ppk or USIG shall be used. If the config variable is set to "true" a valid verifierfactory class must be present.

Returns

true if it is to be used, false otherwise.

5.215.3 Member Data Documentation

5.215.3.1 `boolean navigators.smart.tom.util.Configuration.authentication` [protected]

5.215.3.2 `int navigators.smart.tom.util.Configuration.autoConnectLimit` [protected]

5.215.3.3 `boolean navigators.smart.tom.util.Configuration.channelsBlocking` [protected]

5.215.3.4 `String navigators.smart.tom.util.Configuration.configHome = ""` [static], [protected]

5.215.3.5 `Map<String,String> navigators.smart.tom.util.Configuration.configs` [protected]

5.215.3.6 `BigInteger navigators.smart.tom.util.Configuration.DH_G` [protected]

5.215.3.7 `BigInteger navigators.smart.tom.util.Configuration.DH_P` [protected]

5.215.3.8 `HostsConfig navigators.smart.tom.util.Configuration.hosts` [protected]

5.215.3.9 `String navigators.smart.tom.util.Configuration.hostsFileName = ""` [static], [protected]

5.215.3.10 `int navigators.smart.tom.util.Configuration.processId` `[protected]`

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

- `modular-smart/src/navigators/smart/tom/util/Configuration.java`

5.216 navigators.smart.tom.util.DebugInfo Class Reference

Public Member Functions

- `DebugInfo` (`int eid`, `int round`, `int leader`)

Public Attributes

- final `int eid`
- final `int round`
- final `int leader`

5.216.1 Constructor & Destructor Documentation

5.216.1.1 `navigators.smart.tom.util.DebugInfo.DebugInfo (int eid, int round, int leader)`

5.216.2 Member Data Documentation

5.216.2.1 final `int navigators.smart.tom.util.DebugInfo.eid`

5.216.2.2 final `int navigators.smart.tom.util.DebugInfo.leader`

5.216.2.3 final `int navigators.smart.tom.util.DebugInfo.round`

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

- `modular-smart/src/navigators/smart/tom/util/DebugInfo.java`

5.217 navigators.smart.tom.util.FileIO Class Reference

Static Public Member Functions

- static void `write` (`String str`, `String fileName`)
- static void `write` (`String[] str`, `String fileName`)
- static void `append` (`String[] str`, `String fileName`, `String column`) throws `IOException`
- static void `append` (`String[][] str`, `String fileName`, `String column`, `int columnSize`) throws `IOException`
- static void `append` (`String str`, `String fileName`)
- static `String read` (`String fileName`)
- static void `copy` (`String src`, `String dest`)
- static `String createDirectory` (`String baseDir`)

5.217.1 Detailed Description

Class to work with text files.

5.217.2 Member Function Documentation

5.217.2.1 `static void navigators.smart.tom.util.FileIO.append (String[] str, String fileName, String column) throws IOException` `[static]`

5.217.2.2 `static void navigators.smart.tom.util.FileIO.append (String str[], String fileName, String column, int columnSize) throws IOException` `[static]`

5.217.2.3 `static void navigators.smart.tom.util.FileIO.append (String str, String fileName)` `[static]`

Appends a string at the end of an existing file. If the file does not exist it creates it.

Parameters

<i>str</i>	Specifies the string that should be written into file.
<i>fileName</i>	Specifies the name of the file to be stored.

Exceptions

<i>IOException</i>	Thrown if it cannot open the file or append the content at the end of the file.
--------------------	---

5.217.2.4 `static void navigators.smart.tom.util.FileIO.copy (String src, String dest)` `[static]`

Copy file *src* to file *dest*

Parameters

<i>fileName</i>	Specifies the name of the file to be stored.
-----------------	--

Returns

A string that contains the whole content of the file.

Exceptions

<i>IOException</i>	Thrown if the file does not exist.
--------------------	------------------------------------

5.217.2.5 `static String navigators.smart.tom.util.FileIO.createDirectory (String baseDir)` `[static]`

5.217.2.6 `static String navigators.smart.tom.util.FileIO.read (String fileName)` `[static]`

Reads the content of a file and returns it as a string.

Parameters

<i>fileName</i>	Specifies the name of the file to be stored.
-----------------	--

Returns

A string that contains the whole content of the file.

Exceptions

<i>IOException</i>	Thrown if the file does not exist.
--------------------	------------------------------------

5.217.2.7 `static void navigators.smart.tom.util.FileIO.write (String str, String fileName)` `[static]`

Writes a string into a file.

Parameters

<i>str</i>	Specifies the string that should be written into file.
<i>fileName</i>	Specifies the name of storing file.

Exceptions

<i>IOException</i>	Thrown if it can not open the file or write in it.
--------------------	--

5.217.2.8 `static void navigators.smart.tom.util.FileIO.write (String[] str, String fileName)` `[static]`

Writes a string into a file.

Parameters

<i>str</i>	Specifies the string that should be written into file.
<i>fileName</i>	Specifies the name of storing file.

Exceptions

<i>IOException</i>	Thrown if it can not open the file or write in it.
--------------------	--

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

- modular-smart/src/navigators/smart/tom/util/FileIO.java

5.218 navigators.smart.tom.util.FileLocker Class Reference

Public Member Functions

- [FileLocker](#) (File file)
- boolean [lock](#) ()
- void [release](#) ()

5.218.1 Detailed Description

This class controls access to any file so that multiple JVMs will not be able to write to the file at the same time.

A file called "filename.lock" is created and Java's FileLock class is used to lock the file.

The java.nio classes were introduced in Java 1.4, so this class does a no-op when used with Java 1.3. The class maintains compatability with Java 1.3 by accessing the java.nio classes using reflection.

5.218.2 Constructor & Destructor Documentation

5.218.2.1 `navigators.smart.tom.util.FileLocker.FileLocker (File file)`

5.218.3 Member Function Documentation

5.218.3.1 boolean navigators.smart.tom.util.FileLocker.lock ()

Obtains a lock on the file. This blocks until the lock is obtained.

5.218.3.2 void navigators.smart.tom.util.FileLocker.release ()

Releases the lock on the file.

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

- modular-smart/src/navigators/smart/tom/util/FileLocker.java

5.219 navigators.smart.tom.util.HostsConfig Class Reference

Classes

- class [Config](#)

Public Member Functions

- [HostsConfig](#) (String configHome, String fileName)
- int [getNum](#) ()
- InetAddress [getRemoteAddress](#) (int id)
- int [getPort](#) (int id)
- void [setPort](#) (int id, int port)
- String [getHost](#) (int id)
- InetAddress [getLocalAddress](#) (int id)

5.219.1 Constructor & Destructor Documentation

5.219.1.1 navigators.smart.tom.util.HostsConfig.HostsConfig (String configHome, String fileName)

Creates a new instance of ServersConfig

5.219.2 Member Function Documentation

5.219.2.1 String navigators.smart.tom.util.HostsConfig.getHost (int id)

5.219.2.2 InetAddress navigators.smart.tom.util.HostsConfig.getLocalAddress (int id)

5.219.2.3 int navigators.smart.tom.util.HostsConfig.getNum ()

5.219.2.4 int navigators.smart.tom.util.HostsConfig.getPort (int id)

5.219.2.5 InetAddress navigators.smart.tom.util.HostsConfig.getRemoteAddress (int id)

5.219.2.6 void navigators.smart.tom.util.HostsConfig.setPort (int id, int port)

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

- modular-smart/src/navigators/smart/tom/util/HostsConfig.java

5.220 navigators.smart.tom.util.HostsConfig.Config Class Reference

Public Member Functions

- [Config](#) (int [id](#), String [host](#), int [port](#))

Public Attributes

- int [id](#)
- String [host](#)
- int [port](#)

5.220.1 Constructor & Destructor Documentation

5.220.1.1 `navigators.smart.tom.util.HostsConfig.Config.Config (int id, String host, int port)`

5.220.2 Member Data Documentation

5.220.2.1 String `navigators.smart.tom.util.HostsConfig.Config.host`

5.220.2.2 int `navigators.smart.tom.util.HostsConfig.Config.id`

5.220.2.3 int `navigators.smart.tom.util.HostsConfig.Config.port`

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

- `modular-smart/src/navigators/smart/tom/util/HostsConfig.java`

5.221 navigators.smart.tom.util.JavaSpin Class Reference

Static Public Member Functions

- static void [Spin](#) (double *cpuLoad*)
- static void [main](#) (String[] *args*)

Static Package Attributes

- static final double [CPU_FACTOR](#) = 0.4529

5.221.1 Detailed Description

Author

Vahid Mohammadi <Svmo at KTH.Se>

5.221.2 Member Function Documentation

5.221.2.1 `static void navigators.smart.tom.util.JavaSpin.main (String[] args)` `[static]`

5.221.2.2 `static void navigators.smart.tom.util.JavaSpin.Spin (double cpuLoad)` `[static]`

5.221.3 Member Data Documentation

5.221.3.1 `final double navigators.smart.tom.util.JavaSpin.CPU_FACTOR = 0.4529` `[static]`, `[package]`

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

- modular-smart/src/navigators/smart/tom/util/JavaSpin.java

5.222 navigators.smart.tom.util.Logger Class Reference

Static Public Member Functions

- static void `println` (String msg)
- static void `print` (String msg)
- static void `LogFile` (String msg[])

Static Public Attributes

- static boolean `debug` = false
- static int `prID` = 0

5.222.1 Member Function Documentation

5.222.1.1 `static void navigators.smart.tom.util.Logger.LogFile (String msg[])` `[static]`

5.222.1.2 `static void navigators.smart.tom.util.Logger.print (String msg)` `[static]`

5.222.1.3 `static void navigators.smart.tom.util.Logger.println (String msg)` `[static]`

5.222.2 Member Data Documentation

5.222.2.1 `boolean navigators.smart.tom.util.Logger.debug = false` `[static]`

5.222.2.2 `int navigators.smart.tom.util.Logger.prID = 0` `[static]`

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

- modular-smart/src/navigators/smart/tom/util/Logger.java

5.223 navigators.smart.tom.util.ReceivedMessage Class Reference

Public Member Functions

- `ReceivedMessage` (byte[] data, int from)
- int `getFrom` ()
- byte[] `getData` ()

5.223.1 Constructor & Destructor Documentation

5.223.1.1 `navigators.smart.tom.util.ReceivedMessage.ReceivedMessage (byte[] data, int from)`

Creates a new instance of Message

5.223.2 Member Function Documentation

5.223.2.1 `byte [] navigators.smart.tom.util.ReceivedMessage.getData ()`

5.223.2.2 `int navigators.smart.tom.util.ReceivedMessage.getFrom ()`

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

- modular-smart/src/navigators/smart/tom/util/ReceivedMessage.java

5.224 navigators.smart.tom.util.RSAKeyLoader Class Reference

Public Member Functions

- [RSAKeyLoader](#) ([TOMConfiguration](#) conf, String configHome)
- `PublicKey[] loadServersPublicKeys ()` throws Exception
- `PublicKey loadPublicKey (int id)` throws Exception
- `PrivateKey loadPrivateKey ()` throws Exception

5.224.1 Detailed Description

Used to load JCA public and private keys from `conf/keys/publickey<id>` and `conf/keys/privatekey<id>`

5.224.2 Constructor & Destructor Documentation

5.224.2.1 `navigators.smart.tom.util.RSAKeyLoader.RSAKeyLoader (TOMConfiguration conf, String configHome)`

Creates a new instance of [RSAKeyLoader](#)

5.224.3 Member Function Documentation

5.224.3.1 `PrivateKey navigators.smart.tom.util.RSAKeyLoader.loadPrivateKey ()` throws Exception

Loads the private key of this process

Returns

the `PrivateKey` loaded from `config/keys/publickey<conf.getProcessId()>`

Exceptions

<i>Exception</i>	problems reading or parsing the key
------------------	-------------------------------------

5.224.3.2 `PublicKey navigators.smart.tom.util.RSAKeyLoader.loadPublicKey (int id)` throws Exception

Loads the public key of some processes from configuration files

Parameters

<i>id</i>	the id of the process that we want to load the public key
-----------	---

Returns

the PublicKey loaded from config/keys/publickey<id>

Exceptions

<i>Exception</i>	problems reading or parsing the key
------------------	-------------------------------------

5.224.3.3 PublicKey [] navigators.smart.tom.util.RSAKeyLoader.loadServersPublicKeys () throws Exception

Load the public keys from processes 0..conf.getN()-1 (all servers).

Returns

the array of public keys loaded

Exceptions

<i>Exception</i>	problems reading or parsing the keys
------------------	--------------------------------------

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

- modular-smart/src/navigators/smart/tom/util/RSAKeyLoader.java

5.225 navigators.smart.tom.util.RSAKeyPairGenerator Class Reference

Public Member Functions

- [RSAKeyPairGenerator](#) ()
- void [run](#) (int id) throws Exception

Static Public Member Functions

- static void [main](#) (String[] args)

5.225.1 Detailed Description

Utility class used to generate a key pair for some process id on config/keys/publickey<id> and config/keys/privatekey<id>

5.225.2 Constructor & Destructor Documentation

5.225.2.1 navigators.smart.tom.util.RSAKeyPairGenerator.RSAKeyPairGenerator ()

Creates a new instance of KeyPairGenerator

5.225.3 Member Function Documentation

5.225.3.1 static void navigators.smart.tom.util.RSAKeyPairGenerator.main (String[] args) [static]

5.225.3.2 void navigators.smart.tom.util.RSAKeyPairGenerator.run (int *id*) throws Exception

Generate the key pair for the process with id = <id> and put it on the files config/keys/publickey<id> and config/keys/privatekey<id>

Parameters

<i>id</i>	the id of the process to generate key
-----------	---------------------------------------

Exceptions

<i>Exception</i>	something goes wrong when writing the files
------------------	---

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

- modular-smart/src/navigators/smart/tom/util/RSAKeyPairGenerator.java

5.226 navigators.smart.tom.util.SerialisationHelper Class Reference

Static Public Member Functions

- static void [writeByteArray](#) (byte[] array, DataOutput out) throws IOException
- static void [writeByteArray](#) (byte[] array, ByteBuffer out)
- static void [writeByteArray](#) (byte[] array, [MessageSink](#) out)
- static void [writeByteArray](#) (List< byte[]> src, ByteBuffer out)
- static int [getNumberOfBytes](#) (byte[] array)
- static byte[] [readByteArray](#) (DataInput in) throws IOException
- static byte[] [readByteArray](#) (ByteBuffer in)
- static void [writeObject](#) (Object content, DataOutput out) throws IOException
- static byte[] [writeObject](#) (Object content)
- static Object [readObject](#) (DataInput in) throws IOException, ClassNotFoundException
- static Object [readObject](#) (ByteBuffer in) throws IOException, ClassNotFoundException
- static void [writeString](#) (String op, DataOutput out) throws IOException
- static String [readString](#) (DataInput in) throws IOException

5.226.1 Detailed Description

Author

Christian Spann <christian.spann at uni-ulm.de>

5.226.2 Member Function Documentation

5.226.2.1 static int navigators.smart.tom.util.SerialisationHelper.getNumberOfBytes (byte[] *array*) [static]

5.226.2.2 static byte [] navigators.smart.tom.util.SerialisationHelper.readByteArray (DataInput *in*) throws IOException [static]

5.226.2.3 static byte [] navigators.smart.tom.util.SerialisationHelper.readByteArray (ByteBuffer *in*) [static]

5.226.2.4 static Object navigators.smart.tom.util.SerialisationHelper.readObject (DataInput *in*) throws IOException, ClassNotFoundException [static]

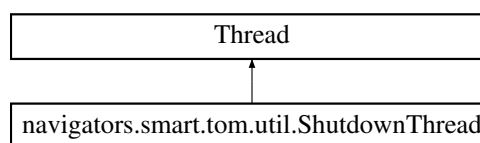
- 5.226.2.5 `static Object navigators.smart.tom.util.SerialisationHelper.readObject (ByteBuffer in) throws IOException, ClassNotFoundException [static]`
- 5.226.2.6 `static String navigators.smart.tom.util.SerialisationHelper.readString (DataInput in) throws IOException [static]`
- 5.226.2.7 `static void navigators.smart.tom.util.SerialisationHelper.writeByteArray (byte[] array, DataOutput out) throws IOException [static]`
- 5.226.2.8 `static void navigators.smart.tom.util.SerialisationHelper.writeByteArray (byte[] array, ByteBuffer out) [static]`
- 5.226.2.9 `static void navigators.smart.tom.util.SerialisationHelper.writeByteArray (byte[] array, MessageSink out) [static]`
- 5.226.2.10 `static void navigators.smart.tom.util.SerialisationHelper.writeByteArray (List< byte[]> src, ByteBuffer out) [static]`
- 5.226.2.11 `static void navigators.smart.tom.util.SerialisationHelper.writeObject (Object content, DataOutput out) throws IOException [static]`
- 5.226.2.12 `static byte [] navigators.smart.tom.util.SerialisationHelper.writeObject (Object content) [static]`
- 5.226.2.13 `static void navigators.smart.tom.util.SerialisationHelper.writeString (String op, DataOutput out) throws IOException [static]`

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

- modular-smart/src/navigators/smart/tom/util/SerialisationHelper.java

5.227 navigators.smart.tom.util.ShutdownThread Class Reference

Inheritance diagram for navigators.smart.tom.util.ShutdownThread:



Public Member Functions

- [ShutdownThread](#) ([SystemCommunication](#) *scs*, [ConsensusService](#) *consensus*, [TOMLayer](#) *tomLayer*)
- void [run](#) ()

Package Attributes

- [ConsensusService](#) *conSrv*

5.227.1 Detailed Description

Print information about the replica when it is shutdown.

5.227.2 Constructor & Destructor Documentation

5.227.2.1 `navigators.smart.tom.util.ShutdownThread.ShutdownThread (SystemCommunication scs, ConsensusService consensus, TOMLayer tomLayer)`

5.227.3 Member Function Documentation

5.227.3.1 `void navigators.smart.tom.util.ShutdownThread.run ()`

5.227.4 Member Data Documentation

5.227.4.1 **ConsensusService** `navigators.smart.tom.util.ShutdownThread.conSrv` [package]

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

- modular-smart/src/navigators/smart/tom/util/ShutdownThread.java

5.228 navigators.smart.tom.util.Storage Class Reference

Public Member Functions

- [Storage](#) (int *size*)
- int [getCount](#) ()
- void [reset](#) ()
- void [storeDuration](#) (long *value*)
- long [getAverage](#) (boolean *limit*)
- double [getDP](#) (boolean *limit*)
- long[] [getValues](#) ()
- long [getMax](#) (boolean *limit*)

5.228.1 Constructor & Destructor Documentation

5.228.1.1 `navigators.smart.tom.util.Storage.Storage (int size)`

Creates a new instance of [Storage](#)

5.228.2 Member Function Documentation

5.228.2.1 `long navigators.smart.tom.util.Storage.getAverage (boolean limit)`

5.228.2.2 `int navigators.smart.tom.util.Storage.getCount ()`

5.228.2.3 `double navigators.smart.tom.util.Storage.getDP (boolean limit)`

5.228.2.4 `long navigators.smart.tom.util.Storage.getMax (boolean limit)`

5.228.2.5 `long [] navigators.smart.tom.util.Storage.getValues ()`

5.228.2.6 `void navigators.smart.tom.util.Storage.reset ()`

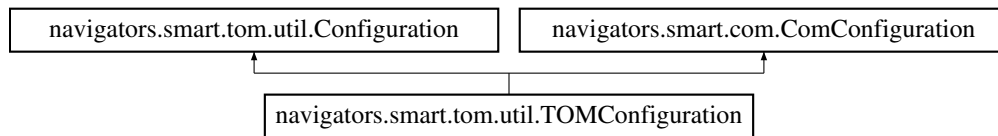
5.228.2.7 `void navigators.smart.tom.util.Storage.storeDuration (long value)`

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

- modular-smart/src/navigators/smart/tom/util/Storage.java

5.229 navigators.smart.tom.util.TOMConfiguration Class Reference

Inheritance diagram for navigators.smart.tom.util.TOMConfiguration:



Public Member Functions

- [TOMConfiguration](#) ([TOMConfiguration](#) conf, int [processId](#))
- [TOMConfiguration](#) (int [processId](#))
- [TOMConfiguration](#) (int [processId](#), String [configHome](#))
- [TOMConfiguration](#) (int [processId](#), String [configHome](#), String [hostsFileName](#))
- int [getMaxMessageSize](#) ()
- int [getRequestTimeout](#) ()
- int [getReplyVerificationTime](#) ()
- int [getN](#) ()
- int [getNumberOfServers](#) ()
- int [getF](#) ()
- int [getTOMPeriod](#) ()
- int [getFreezeInitialTimeout](#) ()
- int [getPaxosHighMark](#) ()
- int [getRevivalHighMark](#) ()
- int [getMaxBatchSize](#) ()
- int [getBatchInterval](#) ()
- boolean [isDecideMessagesEnabled](#) ()
- boolean [isStateTransferEnabled](#) ()
- boolean [isBatchingEnabled](#) ()
- boolean [canVerifyTimestamps](#) ()
- int [getInQueueSize](#) ()
- int [getOutQueueSize](#) ()
- boolean [useSenderThread](#) ()
- int [clientServerCommSystem](#) ()
- int [getNumberOfNIOThreads](#) ()
- int [getNumberOfNonces](#) ()
- int [getCommBuffering](#) ()
- int [getUseSignatures](#) ()
- int [getUseMACs](#) ()
- int [getCheckpointInterval](#) ()
- int [getUpdateBatchSize](#) ()
- int [getUpdateUseHash](#) ()
- int [getUpdateUseReplyHash](#) ()
- int [getReplyUseHash](#) ()
- int [getUseControlFlow](#) ()
- int [getServerComPort](#) (int [procid](#))
- int [getSignatureSize](#) ()

Static Public Member Functions

- static PublicKey[] [getRSAServersPublicKeys](#) ()
- static PublicKey [getRSAPublicKey](#) (int id)
- static PrivateKey [getRSAPrivateKey](#) ()

Protected Member Functions

- void [init](#) ()

Protected Attributes

- int [n](#)
- int [f](#)
- int [requestTimeout](#)
- int [freezeInitialTimeout](#)
- int [tomPeriod](#)
- int [paxosHighMark](#)
- int [revivalHighMark](#)
- int [replyVerificationTime](#)
- int [maxBatchSize](#)
- int [batchInterval](#)
- int [numberOfNonces](#)
- int [inQueueSize](#)
- int [outQueueSize](#)
- boolean [decideMessagesEnabled](#)
- boolean [verifyTimestamps](#)
- boolean [useSenderThread](#)
- [Logger](#) [log](#)
- int [clientServerCommSystem](#)

Static Protected Attributes

- static [RSAKeyLoader](#) [rsaLoader](#)

5.229.1 Constructor & Destructor Documentation

5.229.1.1 `navigators.smart.tom.util.TOMConfiguration.TOMConfiguration (TOMConfiguration conf, int processId)`

5.229.1.2 `navigators.smart.tom.util.TOMConfiguration.TOMConfiguration (int processId)`

Creates a new instance of [TOMConfiguration](#)

5.229.1.3 `navigators.smart.tom.util.TOMConfiguration.TOMConfiguration (int processId, String configHome)`

Creates a new instance of [TOMConfiguration](#)

5.229.1.4 `navigators.smart.tom.util.TOMConfiguration.TOMConfiguration (int processId, String configHome, String hostsFileName)`

Creates a new instance of [TOMConfiguration](#)

5.229.2 Member Function Documentation

5.229.2.1 `boolean navigators.smart.tom.util.TOMConfiguration.canVerifyTimestamps ()`

5.229.2.2 `int navigators.smart.tom.util.TOMConfiguration.clientServerCommSystem ()`

Returns

0 (Netty), 1 (MINA)

5.229.2.3 `int navigators.smart.tom.util.TOMConfiguration.getBatchInterval ()`

5.229.2.4 `int navigators.smart.tom.util.TOMConfiguration.getCheckpointInterval ()`

Indicates the checkpoint period used when fetching the state from the application

5.229.2.5 `int navigators.smart.tom.util.TOMConfiguration.getCommBuffering ()`

Number of requests from clients buffered by the client communication system before delivering to the TOM Layer

5.229.2.6 `int navigators.smart.tom.util.TOMConfiguration.getF ()`

5.229.2.7 `int navigators.smart.tom.util.TOMConfiguration.getFreezeInitialTimeout ()`

5.229.2.8 `int navigators.smart.tom.util.TOMConfiguration.getInQueueSize ()`

5.229.2.9 `int navigators.smart.tom.util.TOMConfiguration.getMaxBatchSize ()`

5.229.2.10 `int navigators.smart.tom.util.TOMConfiguration.getMaxMessageSize ()`

5.229.2.11 `int navigators.smart.tom.util.TOMConfiguration.getN ()`

5.229.2.12 `int navigators.smart.tom.util.TOMConfiguration.getNumberOfNIOThreads ()`

5.229.2.13 `int navigators.smart.tom.util.TOMConfiguration.getNumberOfNonces ()`

Returns

the numberOfNonces

5.229.2.14 `int navigators.smart.tom.util.TOMConfiguration.getNumberOfServers ()`

Implements [navigators.smart.com.ComConfiguration](#).

5.229.2.15 `int navigators.smart.tom.util.TOMConfiguration.getOutQueueSize ()`

Implements [navigators.smart.com.ComConfiguration](#).

5.229.2.16 `int navigators.smart.tom.util.TOMConfiguration.getPaxosHighMark ()`

5.229.2.17 `int navigators.smart.tom.util.TOMConfiguration.getReplyUseHash ()`

- 5.229.2.18 int navigators.smart.tom.util.TOMConfiguration.getReplyVerificationTime ()
- 5.229.2.19 int navigators.smart.tom.util.TOMConfiguration.getRequestTimeout ()
- 5.229.2.20 int navigators.smart.tom.util.TOMConfiguration.getRevivalHighMark ()
- 5.229.2.21 static PrivateKey navigators.smart.tom.util.TOMConfiguration.getRSAPrivateKey () [static]
- 5.229.2.22 static PublicKey navigators.smart.tom.util.TOMConfiguration.getRSAPublicKey (int *id*) [static]
- 5.229.2.23 static PublicKey [] navigators.smart.tom.util.TOMConfiguration.getRSAServersPublicKeys () [static]
- 5.229.2.24 int navigators.smart.tom.util.TOMConfiguration.getServerComPort (int *procid*)

Implements [navigators.smart.com.ComConfiguration](#).

- 5.229.2.25 int navigators.smart.tom.util.TOMConfiguration.getSignatureSize ()
- 5.229.2.26 int navigators.smart.tom.util.TOMConfiguration.getTOMPeriod ()
- 5.229.2.27 int navigators.smart.tom.util.TOMConfiguration.getUpdateBatchSize ()
- 5.229.2.28 int navigators.smart.tom.util.TOMConfiguration.getUpdateUseHash ()
- 5.229.2.29 int navigators.smart.tom.util.TOMConfiguration.getUpdateUseReplyHash ()
- 5.229.2.30 int navigators.smart.tom.util.TOMConfiguration.getUseControlFlow ()

Indicates if a simple control flow mechanism should be used to avoid an overflow of client requests

- 5.229.2.31 int navigators.smart.tom.util.TOMConfiguration.getUseMACs ()

Indicates if MACs should be used (1) or not (0) to authenticate client-server and server-server messages

- 5.229.2.32 int navigators.smart.tom.util.TOMConfiguration.getUseSignatures ()

Indicates if signatures should be used (1) or not (0) to authenticate client requests

- 5.229.2.33 void navigators.smart.tom.util.TOMConfiguration.init () [protected]
- 5.229.2.34 boolean navigators.smart.tom.util.TOMConfiguration.isBatchingEnabled ()
- 5.229.2.35 boolean navigators.smart.tom.util.TOMConfiguration.isDecideMessagesEnabled ()
- 5.229.2.36 boolean navigators.smart.tom.util.TOMConfiguration.isStateTransferEnabled ()
- 5.229.2.37 boolean navigators.smart.tom.util.TOMConfiguration.useSenderThread ()

Implements [navigators.smart.com.ComConfiguration](#).

5.229.3 Member Data Documentation

- 5.229.3.1 int navigators.smart.tom.util.TOMConfiguration.batchInterval [protected]
- 5.229.3.2 int navigators.smart.tom.util.TOMConfiguration.clientServerCommSystem [protected]
- 5.229.3.3 boolean navigators.smart.tom.util.TOMConfiguration.decideMessagesEnabled [protected]
- 5.229.3.4 int navigators.smart.tom.util.TOMConfiguration.f [protected]
- 5.229.3.5 int navigators.smart.tom.util.TOMConfiguration.freezeInitialTimeout [protected]
- 5.229.3.6 int navigators.smart.tom.util.TOMConfiguration.inQueueSize [protected]
- 5.229.3.7 **Logger** navigators.smart.tom.util.TOMConfiguration.log [protected]
- 5.229.3.8 int navigators.smart.tom.util.TOMConfiguration.maxBatchSize [protected]
- 5.229.3.9 int navigators.smart.tom.util.TOMConfiguration.n [protected]
- 5.229.3.10 int navigators.smart.tom.util.TOMConfiguration.numberOfNonces [protected]
- 5.229.3.11 int navigators.smart.tom.util.TOMConfiguration.outQueueSize [protected]
- 5.229.3.12 int navigators.smart.tom.util.TOMConfiguration.paxosHighMark [protected]
- 5.229.3.13 int navigators.smart.tom.util.TOMConfiguration.replyVerificationTime [protected]
- 5.229.3.14 int navigators.smart.tom.util.TOMConfiguration.requestTimeout [protected]
- 5.229.3.15 int navigators.smart.tom.util.TOMConfiguration.revivalHighMark [protected]
- 5.229.3.16 **RSAKeyLoader** navigators.smart.tom.util.TOMConfiguration.rsaLoader [static],[protected]
- 5.229.3.17 int navigators.smart.tom.util.TOMConfiguration.tomPeriod [protected]
- 5.229.3.18 boolean navigators.smart.tom.util.TOMConfiguration.useSenderThread [protected]
- 5.229.3.19 boolean navigators.smart.tom.util.TOMConfiguration.verifyTimestamps [protected]

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

- modular-smart/src/navigators/smart/tom/util/TOMConfiguration.java

5.230 navigators.smart.tom.util.TOMUtil Class Reference

Public Member Functions

- [TOMUtil](#) () throws NoSuchAlgorithmException, InvalidKeyException, SignatureException
- int [getSignatureSize](#) ()
- synchronized void [signMessage](#) (PrivateKey key, [TOMMessage](#) message)
- synchronized boolean [verifySignature](#) (PublicKey key, [TOMMessage](#) message, byte[] signature)

Static Public Member Functions

- static String [byteArrayToString](#) (byte[] b)

Static Public Attributes

- static final byte `MSGTYPEID_TOM` = 1
- static final byte `MSGTYPEID_FORWARDED` = 2
- static final byte `MSGTYPEID_RR` = 3
- static final byte `MSGTYPEID_RT` = 4
- static final byte `MSGTYPEID_SM` = 5
- static final int `RR_REQUEST` = 0
- static final int `RR_REPLY` = 1
- static final int `RR_DELIVERED` = 2
- static final int `RT_TIMEOUT` = 3
- static final int `RT_COLLECT` = 4
- static final int `RT_LEADER` = 5
- static final int `SM_REQUEST` = 6
- static final int `SM_REPLY` = 7

5.230.1 Constructor & Destructor Documentation

- 5.230.1.1 `navigators.smart.tom.util.TOMUtil.TOMUtil ()` throws `NoSuchAlgorithmException`, `InvalidKeyException`, `SignatureException`

5.230.2 Member Function Documentation

- 5.230.2.1 `static String navigators.smart.tom.util.TOMUtil.byteArrayToString (byte[] b)` [`static`]

- 5.230.2.2 `int navigators.smart.tom.util.TOMUtil.getSignatureSize ()`

- 5.230.2.3 `synchronized void navigators.smart.tom.util.TOMUtil.signMessage (PrivateKey key, TOMMessage message)`

Sign a message.

Parameters

<i>key</i>	the private key to be used to generate the signature
<i>message</i>	the message to be signed

Exceptions

<i>SignatureException</i>	
---------------------------	--

- 5.230.2.4 `synchronized boolean navigators.smart.tom.util.TOMUtil.verifySignature (PublicKey key, TOMMessage message, byte[] signature)`

Verify the signature of a message.

Parameters

<i>key</i>	the public key to be used to verify the signature
<i>message</i>	the signed message
<i>signature</i>	the signature to be verified

Returns

the signature

5.230.3 Member Data Documentation

5.230.3.1 final byte navigators.smart.tom.util.TOMUtil.MSGTYPEID_FORWARDED = 2 [static]

5.230.3.2 final byte navigators.smart.tom.util.TOMUtil.MSGTYPEID_RR = 3 [static]

5.230.3.3 final byte navigators.smart.tom.util.TOMUtil.MSGTYPEID_RT = 4 [static]

5.230.3.4 final byte navigators.smart.tom.util.TOMUtil.MSGTYPEID_SM = 5 [static]

5.230.3.5 final byte navigators.smart.tom.util.TOMUtil.MSGTYPEID_TOM = 1 [static]

5.230.3.6 final int navigators.smart.tom.util.TOMUtil.RR_DELIVERED = 2 [static]

5.230.3.7 final int navigators.smart.tom.util.TOMUtil.RR_REPLY = 1 [static]

5.230.3.8 final int navigators.smart.tom.util.TOMUtil.RR_REQUEST = 0 [static]

5.230.3.9 final int navigators.smart.tom.util.TOMUtil.RT_COLLECT = 4 [static]

5.230.3.10 final int navigators.smart.tom.util.TOMUtil.RT_LEADER = 5 [static]

5.230.3.11 final int navigators.smart.tom.util.TOMUtil.RT_TIMEOUT = 3 [static]

5.230.3.12 final int navigators.smart.tom.util.TOMUtil.SM_REPLY = 7 [static]

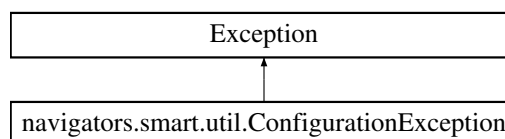
5.230.3.13 final int navigators.smart.tom.util.TOMUtil.SM_REQUEST = 6 [static]

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

- modular-smart/src/navigators/smart/tom/util/TOMUtil.java

5.231 navigators.smart.util.ConfigurationException Class Reference

Inheritance diagram for navigators.smart.util.ConfigurationException:



Public Member Functions

- [ConfigurationException](#) ()
- [ConfigurationException](#) (String msg)
- [ConfigurationException](#) (Throwable cause)
- [ConfigurationException](#) (String msg, Throwable cause)

5.231.1 Constructor & Destructor Documentation

5.231.1.1 `navigators.smart.util.ConfigurationException.ConfigurationException ()`

5.231.1.2 `navigators.smart.util.ConfigurationException.ConfigurationException (String msg)`

5.231.1.3 `navigators.smart.util.ConfigurationException.ConfigurationException (Throwable cause)`

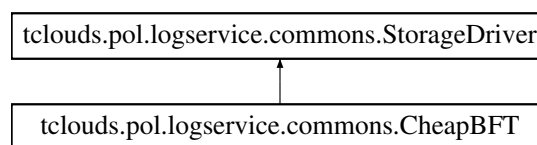
5.231.1.4 `navigators.smart.util.ConfigurationException.ConfigurationException (String msg, Throwable cause)`

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

- `modular-smart/src/navigators/smart/util/ConfigurationException.java`

5.232 tclouds.pol.logservice.common.CheapBFT Class Reference

Inheritance diagram for `tclouds.pol.logservice.common.CheapBFT`:



Public Member Functions

- [CheapBFT](#) ([StandardServiceProxy](#) sp)
- `int store` (`String hostname`, `String prefix`, `String logfile_id`, `String logentry`)
- `List< String > list` ()
- `List< String > retrieve` (`String hostname`, `String prefix`, `String logfile_id`)

5.232.1 Constructor & Destructor Documentation

5.232.1.1 `tclouds.pol.logservice.common.CheapBFT.CheapBFT (StandardServiceProxy sp)`

5.232.2 Member Function Documentation

5.232.2.1 `List<String> tclouds.pol.logservice.common.CheapBFT.list ()`

Implements [tclouds.pol.logservice.common.StorageDriver](#).

5.232.2.2 `List<String> tclouds.pol.logservice.common.CheapBFT.retrieve (String hostname, String prefix, String logfile_id)`

Implements [tclouds.pol.logservice.common.StorageDriver](#).

5.232.2.3 `int tclouds.pol.logservice.common.CheapBFT.store (String hostname, String prefix, String logfile_id, String logentry)`

Implements [tclouds.pol.logservice.common.StorageDriver](#).

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

- `logservice/src/tclouds/pol/logservice/common/CheapBFT.java`

5.233 tclouds.pol.logservice.common.json.JSONData Interface Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONData:

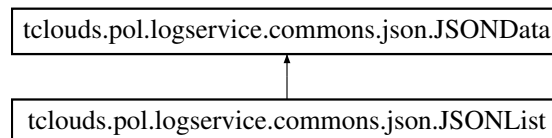


The documentation for this interface was generated from the following file:

- logservice/src/tclouds/pol/logservice/common/json/JSONData.java

5.234 tclouds.pol.logservice.common.json.JSONList Class Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONList:



Public Member Functions

- void [setAuthToken](#) (String token)
- String [toString](#) ()

5.234.1 Member Function Documentation

5.234.1.1 void tclouds.pol.logservice.common.json.JSONList.setAuthToken (String token)

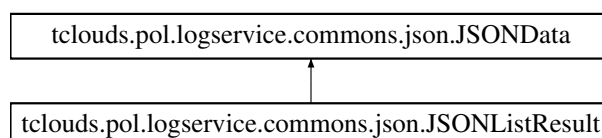
5.234.1.2 String tclouds.pol.logservice.common.json.JSONList.toString ()

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

- logservice/src/tclouds/pol/logservice/common/json/JSONList.java

5.235 tclouds.pol.logservice.common.json.JSONListResult Class Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONListResult:



Public Member Functions

- List< String > [getList](#) ()

- void [add](#) (String s)
- int [getCounter](#) ()
- void [setCounter](#) (int counter)

5.235.1 Member Function Documentation

5.235.1.1 void tclouds.pol.logservice.common.json.JSONListResult.add (String s)

5.235.1.2 int tclouds.pol.logservice.common.json.JSONListResult.getCounter ()

5.235.1.3 List<String> tclouds.pol.logservice.common.json.JSONListResult.getList ()

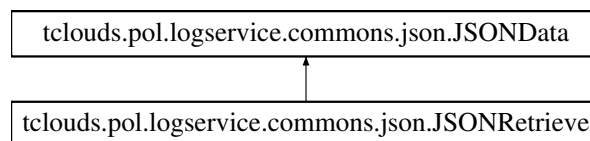
5.235.1.4 void tclouds.pol.logservice.common.json.JSONListResult.setCounter (int counter)

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

- logservice/src/tclouds/pol/logservice/common/json/JSONListResult.java

5.236 tclouds.pol.logservice.common.json.JSONRetrieve Class Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONRetrieve:



Public Member Functions

- String [getLogfileId](#) ()
- String [getMachineId](#) ()
- String [getLogPrefix](#) ()
- String [toString](#) ()

5.236.1 Member Function Documentation

5.236.1.1 String tclouds.pol.logservice.common.json.JSONRetrieve.getLogfileId ()

5.236.1.2 String tclouds.pol.logservice.common.json.JSONRetrieve.getLogPrefix ()

5.236.1.3 String tclouds.pol.logservice.common.json.JSONRetrieve.getMachineId ()

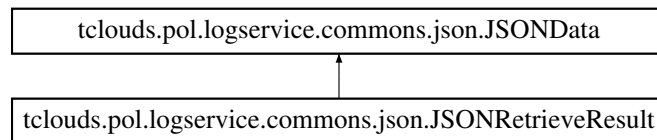
5.236.1.4 String tclouds.pol.logservice.common.json.JSONRetrieve.toString ()

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

- logservice/src/tclouds/pol/logservice/common/json/JSONRetrieve.java

5.237 tclouds.pol.logservice.common.json.JSONRetrieveResult Class Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONRetrieveResult:



Public Member Functions

- List< String > [getList](#) ()
- void [add](#) (String s)
- int [getCounter](#) ()
- void [setCounter](#) (int counter)

5.237.1 Member Function Documentation

5.237.1.1 void tclouds.pol.logservice.common.json.JSONRetrieveResult.add (String s)

5.237.1.2 int tclouds.pol.logservice.common.json.JSONRetrieveResult.getCounter ()

5.237.1.3 List<String> tclouds.pol.logservice.common.json.JSONRetrieveResult.getList ()

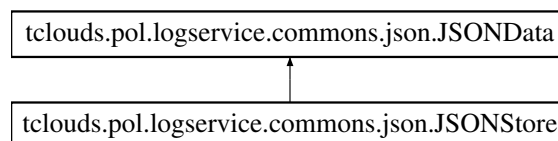
5.237.1.4 void tclouds.pol.logservice.common.json.JSONRetrieveResult.setCounter (int counter)

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

- logservice/src/tclouds/pol/logservice/common/json/JSONRetrieveResult.java

5.238 tclouds.pol.logservice.common.json.JSONStore Class Reference

Inheritance diagram for tclouds.pol.logservice.common.json.JSONStore:



Public Member Functions

- void [setCounter](#) (Integer c)
- void [setLogfileId](#) (String id)
- void [setMachineId](#) (String h)
- String [getLogPrefix](#) ()
- List< String > [getLogEntries](#) ()
- Integer [getCounter](#) ()
- String [getLogfileId](#) ()
- String [getMachineId](#) ()
- String [toString](#) ()

5.238.1 Member Function Documentation

- 5.238.1.1 Integer tclouds.pol.logservice.common.json.JSONStore.getCounter ()
- 5.238.1.2 List<String> tclouds.pol.logservice.common.json.JSONStore.getLogEntries ()
- 5.238.1.3 String tclouds.pol.logservice.common.json.JSONStore.getLogfileId ()
- 5.238.1.4 String tclouds.pol.logservice.common.json.JSONStore.getLogPrefix ()
- 5.238.1.5 String tclouds.pol.logservice.common.json.JSONStore.getMachinelId ()
- 5.238.1.6 void tclouds.pol.logservice.common.json.JSONStore.setCounter (Integer *c*)
- 5.238.1.7 void tclouds.pol.logservice.common.json.JSONStore.setLogfileId (String *id*)
- 5.238.1.8 void tclouds.pol.logservice.common.json.JSONStore.setMachinelId (String *h*)
- 5.238.1.9 String tclouds.pol.logservice.common.json.JSONStore.toString ()

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

- logservice/src/tclouds/pol/logservice/common/json/JSONStore.java

5.239 tclouds.pol.logservice.common.json.JSONData Class Reference

Public Member Functions

- void [setCounter](#) (Integer *c*)
- void [setLogfileId](#) (String *id*)
- void [setOperation](#) (String *o*)
- void [setHostname](#) (String *h*)
- List< String > [getLogentries](#) ()
- Integer [getCounter](#) ()
- String [getOperation](#) ()
- String [getLogfileId](#) ()
- String [getHostname](#) ()
- String [toString](#) ()

5.239.1 Member Function Documentation

- 5.239.1.1 Integer tclouds.pol.logservice.common.json.JSONData.getCounter ()
- 5.239.1.2 String tclouds.pol.logservice.common.json.JSONData.getHostname ()
- 5.239.1.3 List<String> tclouds.pol.logservice.common.json.JSONData.getLogentries ()
- 5.239.1.4 String tclouds.pol.logservice.common.json.JSONData.getLogfileId ()
- 5.239.1.5 String tclouds.pol.logservice.common.json.JSONData.getOperation ()
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5.239.1.7 void `tclouds.pol.logservice.common.JSONData.setHostname (String h)`

5.239.1.8 void `tclouds.pol.logservice.common.JSONData.setLogfileId (String id)`

5.239.1.9 void `tclouds.pol.logservice.common.JSONData.setOperation (String o)`

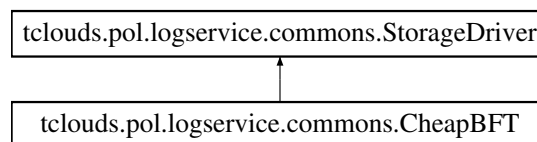
5.239.1.10 String `tclouds.pol.logservice.common.JSONData.toString ()`

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

- `logservice/src/tclouds/pol/logservice/common/JSONData.java`

5.240 `tclouds.pol.logservice.common.StorageDriver` Interface Reference

Inheritance diagram for `tclouds.pol.logservice.common.StorageDriver`:



Public Member Functions

- int [store](#) (String hostname, String prefix, String logfile_id, String logentry)
- List< String > [list](#) ()
- List< String > [retrieve](#) (String hostname, String prefix, String logfile_id)

5.240.1 Member Function Documentation

5.240.1.1 List<String> `tclouds.pol.logservice.common.StorageDriver.list ()`

Implemented in [tclouds.pol.logservice.common.CheapBFT](#).

5.240.1.2 List<String> `tclouds.pol.logservice.common.StorageDriver.retrieve (String hostname, String prefix, String logfile_id)`

Implemented in [tclouds.pol.logservice.common.CheapBFT](#).

5.240.1.3 int `tclouds.pol.logservice.common.StorageDriver.store (String hostname, String prefix, String logfile_id, String logentry)`

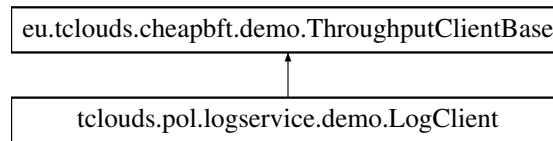
Implemented in [tclouds.pol.logservice.common.CheapBFT](#).

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

- `logservice/src/tclouds/pol/logservice/common/StorageDriver.java`

5.241 tclouds.pol.logservice.demo.LogClient Class Reference

Inheritance diagram for tclouds.pol.logservice.demo.LogClient:



Public Member Functions

- [LogClient](#) (int startid) throws IOException, ConfigurationException

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- String [getPropsNamespace](#) ()
- [TestRun createTestRun](#) (int nworker, int secs)
- [Worker createWorker](#) ([StandardServiceProxy](#) proxy, CountDownLatch startsignal)

Additional Inherited Members

5.241.1 Detailed Description

Example client that updates a BFT replicated service (a counter).

5.241.2 Constructor & Destructor Documentation

5.241.2.1 `tclouds.pol.logservice.demo.LogClient.LogClient (int startid)` throws IOException, ConfigurationException

5.241.3 Member Function Documentation

5.241.3.1 `TestRun tclouds.pol.logservice.demo.LogClient.createTestRun (int nworker, int secs)` [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

5.241.3.2 `Worker tclouds.pol.logservice.demo.LogClient.createWorker (StandardServiceProxy proxy, CountDownLatch startsignal)` [protected], [virtual]

Implements [eu.tclouds.cheapbft.demo.ThroughputClientBase](#).

5.241.3.3 `String tclouds.pol.logservice.demo.LogClient.getPropsNamespace ()` [protected]

5.241.3.4 `static void tclouds.pol.logservice.demo.LogClient.main (String[] args)` throws Exception [static]

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

- logservice/src/tclouds/pol/logservice/demo/LogClient.java

5.242 tclouds.pol.logservice.demo.LogProxy Class Reference

Public Member Functions

- [LogProxy](#) ([StandardServiceProxy](#) proxy)
- int [store](#) (String machineid, String logprefix, String logfileid, String entry) throws IOException
- List< String > [retrieve](#) (String machineid, String logprefix, String logfileid) throws IOException

5.242.1 Constructor & Destructor Documentation

5.242.1.1 tclouds.pol.logservice.demo.LogProxy.LogProxy ([StandardServiceProxy](#) proxy)

5.242.2 Member Function Documentation

5.242.2.1 List<String> tclouds.pol.logservice.demo.LogProxy.retrieve ([String](#) machineid, [String](#) logprefix, [String](#) logfileid) throws IOException

5.242.2.2 int tclouds.pol.logservice.demo.LogProxy.store ([String](#) machineid, [String](#) logprefix, [String](#) logfileid, [String](#) entry) throws IOException

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

- logservice/src/tclouds/pol/logservice/demo/LogProxy.java

5.243 tclouds.pol.logservice.demo.LogRequest Class Reference

Classes

- enum [Type](#)

Public Member Functions

- byte[] [serialize](#) () throws IOException
- [Type](#) [getType](#) ()
- String [getMachineID](#) ()
- String [getPrefix](#) ()
- String [getFileID](#) ()
- String [getEntry](#) ()

Static Public Member Functions

- static [LogRequest](#) [createStore](#) (String machineid, String prefix, String fileid, String entry)
- static [LogRequest](#) [createRetrieve](#) (String machineid, String prefix, String fileid)
- static [LogRequest](#) [deserialize](#) (byte[] bytes) throws IOException

5.243.1 Member Function Documentation

- 5.243.1.1 static **LogRequest** tclouds.pol.logservice.demo.LogRequest.createRetrieve (*String machineid*, *String prefix*, *String fileid*) [static]
- 5.243.1.2 static **LogRequest** tclouds.pol.logservice.demo.LogRequest.createStore (*String machineid*, *String prefix*, *String fileid*, *String entry*) [static]
- 5.243.1.3 static **LogRequest** tclouds.pol.logservice.demo.LogRequest.deserialize (*byte[] bytes*) throws **IOException** [static]
- 5.243.1.4 **String** tclouds.pol.logservice.demo.LogRequest.getEntry ()
- 5.243.1.5 **String** tclouds.pol.logservice.demo.LogRequest.getFileID ()
- 5.243.1.6 **String** tclouds.pol.logservice.demo.LogRequest.getMachineID ()
- 5.243.1.7 **String** tclouds.pol.logservice.demo.LogRequest.getPrefix ()
- 5.243.1.8 **Type** tclouds.pol.logservice.demo.LogRequest.getType ()
- 5.243.1.9 **byte []** tclouds.pol.logservice.demo.LogRequest.serialize () throws **IOException**

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

- logservice/src/tclouds/pol/logservice/demo/LogRequest.java

5.244 tclouds.pol.logservice.demo.LogRequest.Type Enum Reference

Public Attributes

- [Store](#)
- [Retrieve](#)

5.244.1 Member Data Documentation

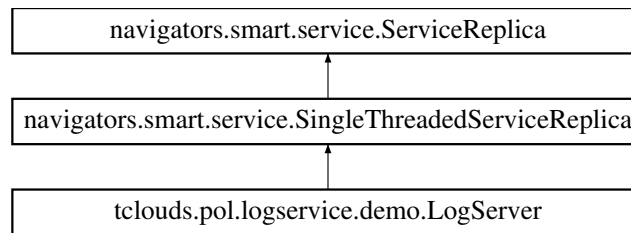
- 5.244.1.1 tclouds.pol.logservice.demo.LogRequest.Type.Retrieve
- 5.244.1.2 tclouds.pol.logservice.demo.LogRequest.Type.Store

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

- logservice/src/tclouds/pol/logservice/demo/LogRequest.java

5.245 tclouds.pol.logservice.demo.LogServer Class Reference

Inheritance diagram for tclouds.pol.logservice.demo.LogServer:



Classes

- enum [HashMode](#)

Public Member Functions

- [LogServer](#) (int id, String logdirbase) throws ConfigurationException, IOException
- void [start](#) () throws IOException, InterruptedException
- void [shutdown](#) ()

Static Public Member Functions

- static void [main](#) (String[] args) throws Exception

Protected Member Functions

- void [activate](#) ()
- [ServiceResult executeCommand](#) (int clientId, long timestamp, byte[] nonces, byte[] command, [DebugInfo](#) info)
- [ServiceCheckpoint createCheckpoint](#) ()
- void [loadCheckpoint](#) ([ServiceCheckpoint](#) cp)
- void [applyUpdate](#) ([ServiceStateUpdate](#) update)

Package Attributes

- int [ncmd](#) = 0

Additional Inherited Members

5.245.1 Constructor & Destructor Documentation

- 5.245.1.1 `tclouds.pol.logservice.demo.LogServer.LogServer (int id, String logdirbase)` throws ConfigurationException, IOException

5.245.2 Member Function Documentation

- 5.245.2.1 `void tclouds.pol.logservice.demo.LogServer.activate ()` [protected]

- 5.245.2.2 `void tclouds.pol.logservice.demo.LogServer.applyUpdate (ServiceStateUpdate update)` [protected], [virtual]

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.245.2.3 ServiceCheckpoint `tclouds.pol.logservice.demo.LogServer.createCheckpoint ()` `[protected]`, `[virtual]`

ISTO E CODIGO DO JOAO, PARA TRATAR DOS CHECKPOINTS

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.245.2.4 ServiceResult `tclouds.pol.logservice.demo.LogServer.executeCommand (int clientId, long timestamp, byte[] nonces, byte[] command, DebugInfo info)` `[protected]`, `[virtual]`

This method is where the application code is to be written. It is meant to be implemented by subclasses of this class. The code for this method MUST use the value of "timestamp" instead of relying on its own local clock, and "nonces" instead of trying to generated its own random values. This is important because this values are the same for all replicas, and therefore, ensure the determinism required in a replicated state machine. It is crucial for the programmer to be aware of this.

Parameters

<i>clientId</i>	The ID of the client that issue the request
<i>timestamp</i>	A timestamp to be used by the application, in case it needs it
<i>nonces</i>	Random values to be used by the application, in case it needs them
<i>command</i>	The command issue by the client

Returns

the reply for the request issued by the client

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.245.2.5 void `tclouds.pol.logservice.demo.LogServer.loadCheckpoint (ServiceCheckpoint cp)` `[protected]`, `[virtual]`

Implements [navigators.smart.service.SingleThreadedServiceReplica](#).

5.245.2.6 static void `tclouds.pol.logservice.demo.LogServer.main (String[] args)` `throws Exception` `[static]`

5.245.2.7 void `tclouds.pol.logservice.demo.LogServer.shutdown ()`

Implements [navigators.smart.service.ServiceReplica](#).

5.245.2.8 void `tclouds.pol.logservice.demo.LogServer.start ()` `throws IOException, InterruptedException`

Implements [navigators.smart.service.ServiceReplica](#).

5.245.3 Member Data Documentation

5.245.3.1 int `tclouds.pol.logservice.demo.LogServer.ncmd = 0` `[package]`

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

- `logservice/src/tclouds/pol/logservice/demo/LogServer.java`

5.246 tclouds.pol.logservice.demo.LogServer.HashMode Enum Reference

Public Attributes

- [FullInstantly](#)
- [FullOnCheckpoint](#)

5.246.1 Member Data Documentation

5.246.1.1 tclouds.pol.logservice.demo.LogServer.HashMode.FullInstantly

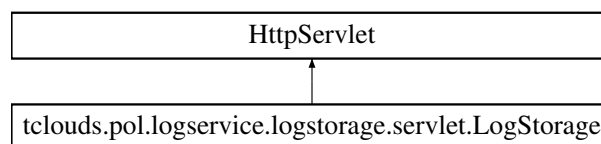
5.246.1.2 tclouds.pol.logservice.demo.LogServer.HashMode.FullOnCheckpoint

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

- logservice/src/tclouds/pol/logservice/demo/LogServer.java

5.247 tclouds.pol.logservice.logstorage.servlet.LogStorage Class Reference

Inheritance diagram for tclouds.pol.logservice.logstorage.servlet.LogStorage:



Public Member Functions

- [LogStorage](#) ()
- void [init](#) (ServletConfig config) throws ServletException

Protected Member Functions

- void [doGet](#) (HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException
- void [doPost](#) (HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException

Package Functions

- void [processCommand](#) (HttpServletRequest request, HttpServletResponse response, StringBuffer sb)
- void [doStore](#) (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException
- void [doRetrieve](#) (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException
- void [doList](#) (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException

5.247.1 Detailed Description

Servlet implementation class [LogStorage](#)

5.247.2 Constructor & Destructor Documentation

5.247.2.1 `tclouds.pol.logservice.logstorage.servlet.LogStorage.LogStorage ()`

See Also

`HttpServlet::HttpServlet()`

5.247.3 Member Function Documentation

5.247.3.1 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.doGet (HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException` `[protected]`

See Also

`HttpServlet::doGet(HttpServletRequest request, HttpServletResponse response)`

5.247.3.2 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.doList (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException` `[package]`

5.247.3.3 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.doPost (HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException` `[protected]`

See Also

`HttpServlet::doPost(HttpServletRequest request, HttpServletResponse response)`

5.247.3.4 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.doRetrieve (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException` `[package]`

sample data

```
{ "authtoken": "0000000000000000", "logfile_id": "86394038-cf29-11e1-9dd3-0025b345ca14" }
```

5.247.3.5 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.doStore (HttpServletRequest request, HttpServletResponse response, StringBuffer sb) throws ServletException, IOException` `[package]`

sample data

```
{ "authtoken": "0000000000000000", "logfile_id": "", "hostname": "www.example.com", "counter": 23, "logentries": [ "Lorem ipsum...", "Dolor simet auter...", "...", "Mort mea summa..." ] }
```

5.247.3.6 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.init (ServletConfig config) throws ServletException`

5.247.3.7 `void tclouds.pol.logservice.logstorage.servlet.LogStorage.processCommand (HttpServletRequest request, HttpServletResponse response, StringBuffer sb)` `[package]`

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

- `logservice/src/tclouds/pol/logservice/logstorage/servlet/LogStorage.java`

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