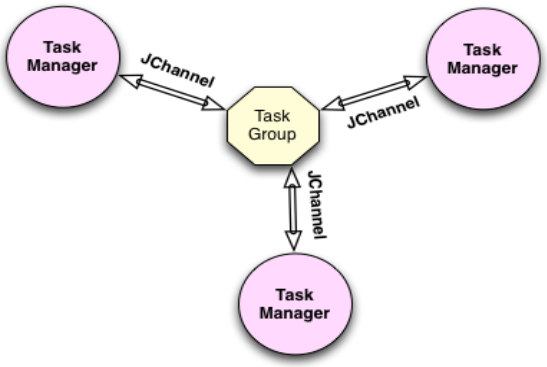

In this assignment we've made a TaskManager application, which utilizes some basic concepts of group communication.

We decided to model our application based on the proposed structure "TaskManager Application" from the assignment. This consists of three TaskManager clients, who handles synchronization by using the JGroups toolkit.

JGroupHelper

We've implemented an abstraction over the JGroup toolkit in the form of a JGroupHelper class with only a few public methods as shown in the documentation below.
This helper class makes it easy to implement and maintain new Task Manager Clients as these do not need to know anything about the specifics of the JGroups toolkit.

Constructors

Constructor and Description
`JGroupHelper(java.lang.String groupIdentifier)` Creates a helper on the local machine
`JGroupHelper(java.lang.String groupIdentifier, java.lang.String ipAddress, int port)` Creates a helper on the given IP and port.

Methods

Modifier and Type	Method and Description
`void`	`addTask(taskManagerGroupCommunication.Task task)` Sends a task to every member of the JGroup
`void`	`addTaskList(taskManagerGroupCommunication.TaskList taskList)` Sends a TaskList to every member of the JGroup
`void`	`close()` Closes the underlying JGroup structures
`taskManagerGroupCommunication.TaskList`	`getTasks()` Returns every task in the JGroups current state

Inside the JGroupHelper we've implemented the JChannels receiver as a private inner class. In the receiver we have implemented the state handling through the State Transfer principle of JGroups. We also make use of Raos ChannelHelper code snippet.

Our helper (and hence our TaskClient) does not support DELETE, as this was not a requirement for the assignment. We chose to focus on getting the JGroups functionality to work.

TaskClient – the client

Our client is a simple console application and is largely a result of what happens when trying to make an otherwise boring task more exciting. Yes, the client is rude. Apart from that, it should be quite easy to follow. It supports three basic commands: GET, ADD and ADDLIST.

GET gets the TaskList state and then prints all tasks.

ADD walks you through adding a task. Behind the scene it creates a Task object and sends it to the group.

ADDLIST is a secret sabotage keyword. As it would make no sense to have the user type in several tasks and then add them to a tasklist and send them (it would be easier to continuously ADD), it has already created a TaskList, which is sent to the group.

Running two clients at once illustrates the functionality: If you add a task on one client, it is also added on the other.

Testing

We have written Unit tests to our JGroupHelper.
There are no failing tests due to the fact that we have no requirements to the contents of a Task-object. Any error you might get, using our code, would be a compile-error.

Test Run

We had a test-run, as seen below. Input is marked in green.

```
WELCOME TO THE TASK MACHINE, BRO
HOLD ON WHILE I FIX YOU A CONNECTION...

-----------------------------------------------------------------
GMS: address=HYPELAPTOP2-20582, cluster=BROCHANNEL, physical address=127.0.0.1:49606
-----------------------------------------------------------------
OK, SO THAT'S GOOD. NOW LET ME WAIT FOR YOUR INPUT, BRO
OK, SO NOW WE'RE READY FOR YOU, 'KAY? SO HERE'S WHAT I WANT YOU TO DO...
 - SO YOU CAN GET ALL TASKS BY TYPING IN 'GET', THAT WILL PRINT 'EM
 - THEN YOU CAN, LIKE, ADD A NEW TASK... I'LL HELP YOU THRU IT JUST TYPE 'ADD'
 - OR YOU CAN ADD AN ENTIRE LIST, JUST GO 'ADDLIST'
 - ... IF YOU WANNA LEAVE, JUST DO THE 'QUIT'
... I'M WAITING

GET|ADD|ADDLIST|QUIT
GET

OK SO YOU WANNA GET THEM TASKS? OK.
NO TASKS, BRO
WE COOL?

GET|ADD|ADDLIST|QUIT
ADD

OK, ADDING TASKS... HERE'S HOW IT GOES. I NAME AN ATTRIBUTE, YOU NAME THE VALUE, OK?
ID:     12
NAME:   Test Event
DATE (YYYY-MM-DD):      2012-12-01
STATUS: Soon.
DESCRIPTION:    This is a test event.
ATTENDANTS:     Me and you.
LOL I ADDED IT !!!!111!!1!1!11111111one

GET|ADD|ADDLIST|QUIT
> New task received. ID: 12
GET

OK SO YOU WANNA GET THEM TASKS? OK.
ID      | NAME  | STATUS
---------------------------------------->
12      | Test Event    | Soon.
WE COOL?

GET|ADD|ADDLIST|QUIT
ADDLIST

OH IM SORRY. DID YOU THINK I WOULD LET YOU ADD A LIST?
OH NO, WE COULDN'T TRUST YOU WITH THIS. I MADE A LIST, THOUGH.
THIS LIST IS GOING STRAIGHT TO YOUR GROUP! MWAHAHAHA
CONSIDER YOURSELF SABOTAGED!

GET|ADD|ADDLIST|QUIT
GET

OK SO YOU WANNA GET THEM TASKS? OK.
ID      | NAME  | STATUS
---------------------------------------->
12      | Test Event    | Soon.
1337    | L337 T45K     | YOU'RE GOING
42      | The Question Will Be Revealed | Cool
WE COOL?

GET|ADD|ADDLIST|QUIT
QUIT
YEAH, YOU BETTER RUN!
```