ServiceMath24Asynch

Project SMath24Asynch

PREVIOUS: *ServiceMath24Synch*

ServiceMath24Asynch Introduction

This is an update of the project described in *ServiceMath24Synch*. The main difference is that the service is now asynchronous.

Asynchronous???

The behavior of a system composed by the service **smath24asynch** and some caller, can be better specified as follows:

- a caller is not constrained to block, waiting for the answer
- the service elaborates each request ‘in parallel’, by activating a new local process

SMath24Asynch-Requirements

The system **smath24asynch** must behave as follows:

1. Wait for a request for the calculation of the **Nth** (**N>=0**) number of Fibonacci.
2. Receive a request (from an external **Caller**) for the calculation of a Fibonacci number.
3. Delegate the calculation of the requested number to a proper executor (named **actionexec**) dynamically activated.
4. The **actionexec** must return to the **Caller** the result of the calculation. The answer must include:
   - the name of the **Caller**
   - the requested number **N**
   - the result
   - the time required for the calculation.

There is no requirement to include in the aswer the time when the request is handled by the service.

SMath24Asynch-Requirements analysis

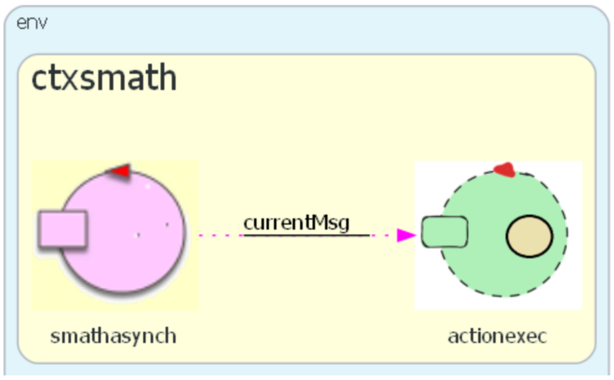
The *qak meta-model* provides the primitve *delegateCurrentMsgTo* that performs two job:

- create a new actor
- delegate the current request to the new creted actor, that will directly respond to the **Caller**

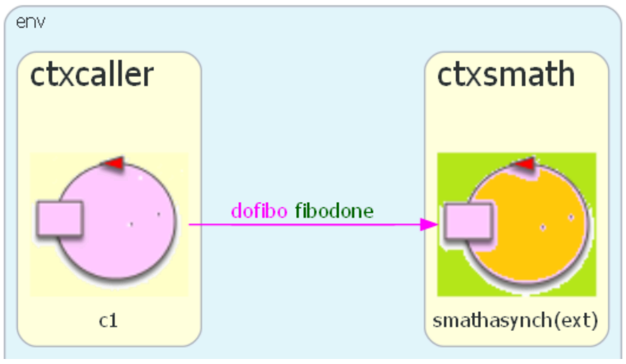
This allows us to immedialtely define **an executable model that formally captures** the requirements expressed in natural language.

SMath24Asynch-model from the Requirements

Model of the *service* (*smath24asynch.qak*)



Model of the system from the *caller* point of view (*smath24asynchcaller.qak*)



SMath24Asynch-Test plans

The *SMath24Asynch-Requirements* do introduce some *User_story* -> useful to define our test plans.

SMath24Asynch: a first test

User story: First test:

The request:

```
IApplMessage req  =
    CommUtils.buildRequest("tester","dofibo","dofibo(8)","smath");
```

expects the answer:

```
fibodone(tester,8,34,...)
```

The test unit *smath24asynchTest* simulates a caller named **tester** that:

- set a TCP-connection with **localhost** at port **8033**
- sends the request **req** over the connection

This test activates the service by using (as done in *PPS0-testUnit*) the utility methods **activateServiceUsingGradle** and **activateServiceUsingDeploy**. The last one, exploits the script *smath24asynch.bat* that activates the service *deployed* on the local machine.

SMath24Asynch: one caller test

User story: One caller test: if I'm the caller of the service **smath24asynch** and I send two requests **fibo(41)** and, afterwards, **fibo(8)**, I expect to receive first the answer **fibodone(8,)** and afterwards the answer **fibodone(41,...)** .

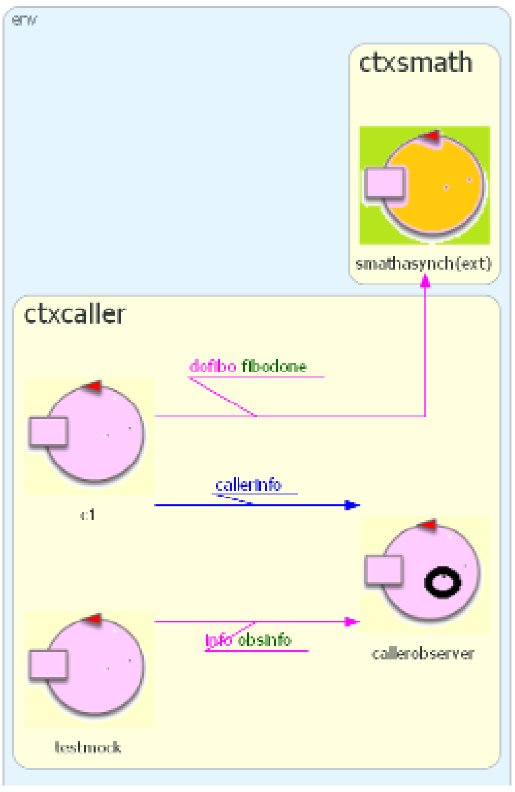
The test unit *SmathasynchTestOneCaller* exploits a model *smath24asynchcaller.qak* that uses a POJO, instance of *ObserverData.java*, to check (method **checkOneCallers()** the sequence of the answers as perceived by the caller.

- **c1** sends two requests to the service **smath24asynch**
- **c1** expects receive first the answer related to the lower number.

The model *smath24asynchcaller.qak* includes:

- an observer of the caller: **callerobserver**
- a **testmock** actor, in order to show that the testunit makes a request **info:info(X)** on the result to the **callerobserver**

The **callerobserver** answers to the request **info** by calling the the method **checkOneCallers()** defined by the POJO *ObserverData.java*



SMath24Asynch-Problem analysis

Our requirment analysis has already shown that we focus our attention on the *internal view* of the service, rather than on view of the system as perceived by the callers.

Moreoer, there is no requirement to include in the aswer the time when the request is handled by the service.

SMath24Asynch-Logical architecture

The model introduced in *SMath24Asynch-model from the Requirements* already captures the logical architecture of the system.

SMath24Asynch-Project

The function **fun fibo(N:Int):Int** that claculates the **Nth** number of Fibonacci should be embedded into an object created by an utility class *MathUtils.kt*.

For an example, see *helloworld3 withobj*.

In our case

```
QActor smath context ctxsmath  withobj math using "MathUtils.create()"
//The object math is an instance of MathUtils.kt: it can be used in the all the states of actor.
```

SMath24Asynch-Testing

Testing was already planned and discussed in the *SMath24Asynch-Test plans*.

SMath24Asynch-Deployment

The deployment process is, at the moment, quite similar to *PPS0-A first Deployment*.

As we can see from the script *smath24asynch.bat*, our deploy directory id now **C:/DidatticRun**

SMath24Asynch-Maintenance

We recall what said in *Update the deployment*.

NEXT: *ServiceMath24Facade*