Running the Sotomayor tutorial

using Childers' Windows GT installation package

Authors: Linh Ngo and Amy Apon, April, 2006

This tutorial illustrates the steps of doing the Sotomayor tutorial on your own Windows computer. The complete tutorial should be referenced, and can be found online at (Chapter 3: Writing your First Stateful Web Service in 5 Easy Steps).

You will need to access:

http://gdp.globus.org/gt4-tutorial/singlehtml/progtutorial_0.2.1.html#chap_core_first

and follow the steps in it. There is one preliminary step.

Step 0: Setting up the environment

- Install Jakarta ant 1.5 or 1.6 from www.ant.apache.org

- Install Java 1.4.2 (recommended) or 1.5

- Install Python 2.4.3 for Windows from http://www.python.org/download/

- Create a folder in your C:\ directory called tutorial

  One way to do this is to Go to Start/Run, types in command "cmd" to open a Windows command console.

  $ cd C:\
  $ mkdir C:\tutorial
  $ cd C:\tutorial

- Download the windows GT install package from
  http://www-unix.mcs.anl.gov/~childers/tutorials/BAS/GPN/gt-install.zip
  to the C:\tutorial folder.

  (See
  http://www-unix.mcs.anl.gov/~childers/tutorials/BAS/GPN/ for the full web page on this.)

- Download Sotomayor tutorial example source code and supporting files from

to the C:\tutorial folder.

See http://gdp.globus.org/gt4-tutorial/ for the starting web page on this.)

- Open two Windows command consoles. You can do this by opening another window by going to to Start/Run and typing in command "cmd" to open a Windows command console.

  Let's call these two windows the **GT window** and the **Exercise window**.

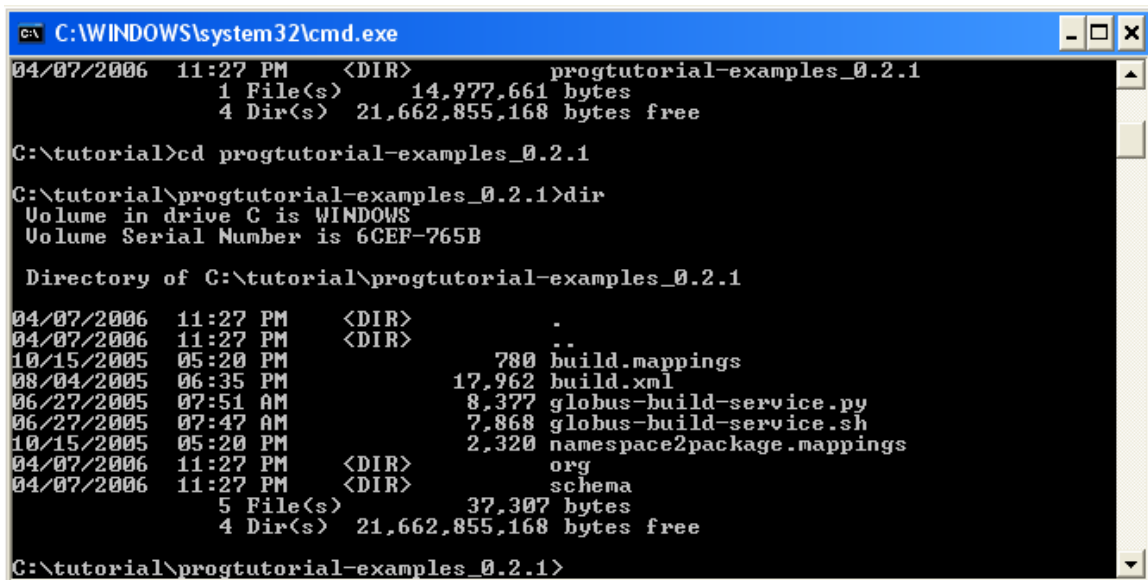- On the **GT Window**, to set up Globus, follow Childers' instructions:

  Unzip gt-install.zip into C:\tutorial

  Set environment variables in the GT window:

  $ cd gt-install
  $ set GLOBUS_LOCATION=C:\tutorial\gt-install
  $ echo %GLOBUS_LOCATION%
  C:\tutorial\gt-install

- On the **Exercise Window**
Unzip the Sotomayor tutorial into the c:\tutorial\progtutorial-examples_0.2.1 directory. It should look like this:

```
C:\WINDOWS\system32\cmd.exe

04/07/2006  11:27 PM    <DIR>          progtutorial-examples_0.2.1
             1 File(s)     14,977,661 bytes
             4 Dir(s)  21,662,855,168 bytes free

C:\tutorial>cd progtutorial-examples_0.2.1

C:\tutorial\progtutorial-examples_0.2.1>dir
 Volume in drive C is WINDOWS
 Volume Serial Number is 6CEF-765B

 Directory of C:\tutorial\progtutorial-examples_0.2.1

04/07/2006  11:27 PM    <DIR>          .
04/07/2006  11:27 PM    <DIR>          ..
10/15/2005  05:20 PM              780 build.mappings
08/04/2005  06:35 PM           17,962 build.xml
06/27/2005  07:51 AM            8,377 globus-build-service.py
06/27/2005  07:47 AM            7,868 globus-build-service.sh
10/15/2005  05:20 PM            2,320 namespace2package.mappings
04/07/2006  11:27 PM    <DIR>          org
04/07/2006  11:27 PM    <DIR>          schema
             5 File(s)         37,307 bytes
             4 Dir(s)  21,662,855,168 bytes free

C:\tutorial\progtutorial-examples_0.2.1>
```

Step 1: Defining the interface in WSDL

Read the Sotomayor tutorial, Section 3.1. This step has already been done for you for the basic Math Service. The WSDL file for the Math Service is found in your C:\tutorial directory. Its location is

C:\tutorial\progtutorial-examples_0.2.1\schema\examples\MathService_instance\Math.wsdl

The directory structure for all of the files that you will need to start is described at
http://gdp.globus.org/gt4-tutorial/singlehtml/progtutorial_0.2.1.html#appendix_dirstruct

Step 2: Implementing the service in Java

Read the Sotomayor tutorial, Section 3.2. This step has also already been done for you for the basic Math Service. The Java file for the Math Service is found in your C:\tutorial directory. Its location is

C:\tutorial\progtutorial-examples_0.2.1\org\globus\examples\services\core\first\impl\MathService.java

Read this example carefully!

Step 3: Configuring the deployment in WSDD (and JNDI)

Read the Sotomayor tutorial, Section 3.3. This step has also already been done for you for the basic Math Service. You will not need to modify any of the files described in this section.

Step 4: Create a GAR file with Ant

You will not use ant directly in this step. Rather, you will use the globus-build-service script as described in Section 3.4.2.

On Unix, follow the steps in the Sotomayor tutorial.

On Windows, from the **Exercise Window** in the progtutorial-examples_0.2.1 subdirectory run the following commands:

```
globus-build-service.py -d org\globus\examples\services\core\first\
        -s schema\examples\MathService_instance\Math.wsdl
```

It should look like this at the end:

Step 5: Deploy the service into a Web Services container

Now, you should be able to deploy the service.

To deploy the service on Windows type the following all on one line in the **Exercise Window** from the progtutorial-examples_0.2.1 directory:

%GLOBUS_LOCATION%\bin\globus-deploy-gar org_globus_examples_services_core_first.gar

```
C:\WINDOWS\system32\cmd.exe                                    _ □ ×
04/07/2006  11:27 PM    <DIR>          schema
04/07/2006  11:52 PM    <DIR>          tmp
              6 File(s)        60,802 bytes
              6 Dir(s)  21,533,708,288 bytes free

C:\tutorial\progtutorial-examples_0.2.1>%GLOBUS_LOCATION%\bin\globus-deploy-gar
org_globus_examples_services_core_first.gar
Deploying gar file...

  Deploying gar with profile: <default>
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\schema
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\etc
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\bin
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\docs
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\share
  Created dir: C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar\lib
  Expanding: C:\tutorial\progtutorial-examples_0.2.1\org_globus_examples_servic
s_core_first.gar into C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar
  Copying 4 files to C:\tutorial\gt-install\share\schema
  Copying 3 files to C:\tutorial\gt-install\lib
  deploying server config...
  Created dir: C:\tutorial\gt-install\etc\org_globus_examples_services_core_fir
t
  Copying 1 file to C:\tutorial\gt-install\etc\org_globus_examples_services_cor
_first
  deploying JNDI config...
  Copying 1 file to C:\tutorial\gt-install\etc\org_globus_examples_services_cor
_first
  Deleting directory C:\tutorial\gt-install\share\globus_wsrf_common\tmp\gar

Deploy successful
C:\tutorial\progtutorial-examples_0.2.1>
```

Next, before running the service, in both the **GT-window** and the **Exercise window**, run the following command:

%GLOBUS_LOCATION%\etc\globus-devel-env.bat


```
C:\WINDOWS\system32\cmd.exe                                    _ □ ×
C:\tutorial\gt-install>etc\globus-devel-env.bat
C:\tutorial\gt-install>_
```

Notice: Windows sometimes have trouble with blank space in the directory name (Program Files, for example). Check your CLASSPATH carefully. If needed, reset your CLASSPATH to some simple directory to prevent possible error.


```
C:\WINDOWS\system32\cmd.exe                                    _ □ ×
C:\tutorial\progtutorial-examples_0.2.1>set CLASSPATH=c:\jdk1.5.0_05
```
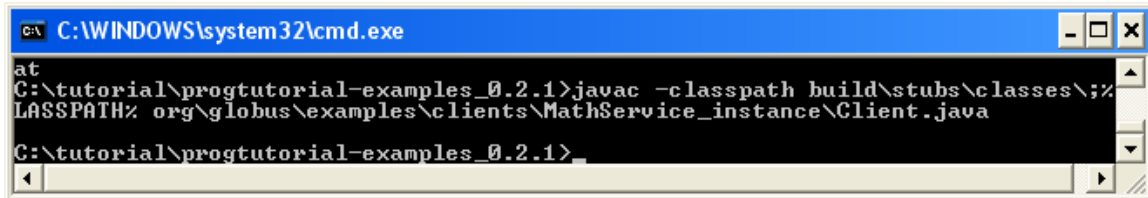
Step 6: Write and compile the client

The client code for the Math Service has already been written for you. Its location is

C:\tutorial\progtutorial-examples_0.2.1\org\globus\examples\clients\MathService_instance\Client.java

To compile the client, in the **Exercise window** from the progtutorial-examples_0.2.1 directory, type:

$ javac –classpath build\stubs\classes\;%CLASSPATH% org\globus\examples\clients\MathService_instance\Client.java
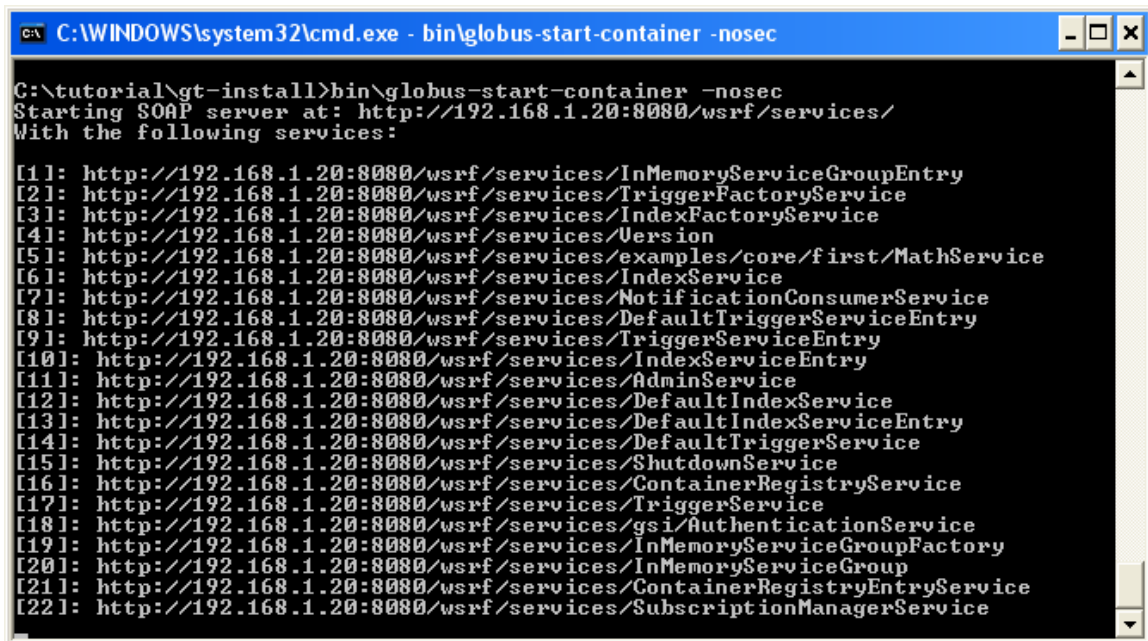
```
C:\WINDOWS\system32\cmd.exe                                          _ □ ×
at
C:\tutorial\progtutorial-examples_0.2.1>javac -classpath build\stubs\classes\;%
LASSPATH% org\globus\examples\clients\MathService_instance\Client.java

C:\tutorial\progtutorial-examples_0.2.1>_
```

Step 7: Start the container and execute the client

In the **GT-Window** from the gt-install subdirectory, start the container:
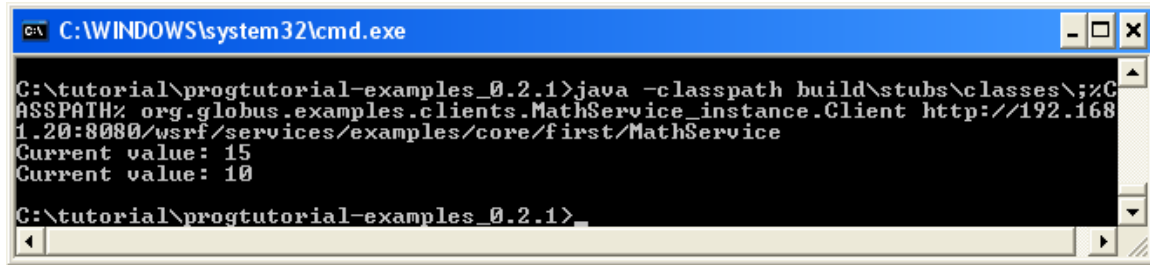
$ bin\globus-start-container -nosec

```
C:\WINDOWS\system32\cmd.exe - bin\globus-start-container -nosec          _ □ ×

C:\tutorial\gt-install>bin\globus-start-container -nosec
Starting SOAP server at: http://192.168.1.20:8080/wsrf/services/
With the following services:

[1]:  http://192.168.1.20:8080/wsrf/services/InMemoryServiceGroupEntry
[2]:  http://192.168.1.20:8080/wsrf/services/TriggerFactoryService
[3]:  http://192.168.1.20:8080/wsrf/services/IndexFactoryService
[4]:  http://192.168.1.20:8080/wsrf/services/Version
[5]:  http://192.168.1.20:8080/wsrf/services/examples/core/first/MathService
[6]:  http://192.168.1.20:8080/wsrf/services/IndexService
[7]:  http://192.168.1.20:8080/wsrf/services/NotificationConsumerService
[8]:  http://192.168.1.20:8080/wsrf/services/DefaultTriggerServiceEntry
[9]:  http://192.168.1.20:8080/wsrf/services/TriggerServiceEntry
[10]: http://192.168.1.20:8080/wsrf/services/IndexServiceEntry
[11]: http://192.168.1.20:8080/wsrf/services/AdminService
[12]: http://192.168.1.20:8080/wsrf/services/DefaultIndexService
[13]: http://192.168.1.20:8080/wsrf/services/DefaultIndexServiceEntry
[14]: http://192.168.1.20:8080/wsrf/services/DefaultTriggerService
[15]: http://192.168.1.20:8080/wsrf/services/ShutdownService
[16]: http://192.168.1.20:8080/wsrf/services/ContainerRegistryService
[17]: http://192.168.1.20:8080/wsrf/services/TriggerService
[18]: http://192.168.1.20:8080/wsrf/services/gsi/AuthenticationService
[19]: http://192.168.1.20:8080/wsrf/services/InMemoryServiceGroupFactory
[20]: http://192.168.1.20:8080/wsrf/services/InMemoryServiceGroup
[21]: http://192.168.1.20:8080/wsrf/services/ContainerRegistryEntryService
[22]: http://192.168.1.20:8080/wsrf/services/SubscriptionManagerService
```

If the service is correctly deployed, we can now run the client in the **Exercise Window**. Type this all without a carriage return into the window:

```
$ java -classpath build\stubs\classes\;%CLASSPATH%
org.globus.examples.clients.MathService_instance.Client
http://127.0.0.1:8080/wsrf/services/examples/core/first/MathService
```

If all is correct, you should see:


```
C:\tutorial\progtutorial-examples_0.2.1>java -classpath build\stubs\classes\;%C
ASSPATH% org.globus.examples.clients.MathService_instance.Client http://192.168
1.20:8080/wsrf/services/examples/core/first/MathService
Current value: 15
Current value: 10

C:\tutorial\progtutorial-examples_0.2.1>
```

Along the way, it is recommended to follow the tutorial of Sotomayor closely, as although the syntax might be different between Unix and Windows, the idea is the same. To sum up the differences between running Sotomayor tutorial on Unix and Windows:

Using .py and .bat instead of .sh
Environment variables are of the form %<ENV_NAME>% instead of $<ENV_NAME>
Spaces inside directory's names are to be avoided.
For java and javac calls, the separator for classpath is ; instead of :
\ instead of /, except for the case of URLs.

Step 8: Add functionality to the service

To test your understanding of the concepts, add Multiply functionality to the service. You can add statements to the files that are similar to statements already there. You need to modify only three files:

The interface definition:
C:\tutorial\progtutorial-examples_0.2.1\schema\examples\MathService_instance\Math.wsdl

The service implementation:
C:\tutorial\progtutorial-examples_0.2.1\org\globus\examples\services\core\first\impl\MathService.java

And the client implementation:
C:\tutorial\progtutorial-examples_0.2.1\org\globus\examples\clients\MathService_instance\Client.java

Then, go through the steps above to build and deploy the service, compile the client, stop and restart the container, and execute the client.

Enjoy!