

EJB Tutorial

A Step by Step Implementation Tutorial for Java RMI

Posted by **Imed Bouchrika** on October 22, 2013 in **Java RMI**

31 Comments

an easier tutorial for Java RMI can be found here

In this RMI Programming tutorial, we will learn how to create :

- Simple Remote Object.
- Server to instantiate (create) and bind a remote object.
- Client to invoke remotely an object

As RMI is a Java to Java only communication protocol, you need to install the Java Development Kit (JDK) as well as a programming editor (IDE) such as Eclipse. For more details of how to install JDK and Eclipse, Use the following tutorial:

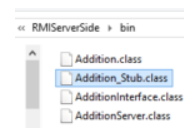
Java Programming : Creating a simple java project using Eclipse

The structure of the files for the projects created using Eclipse throughout this tutorials is shown below:

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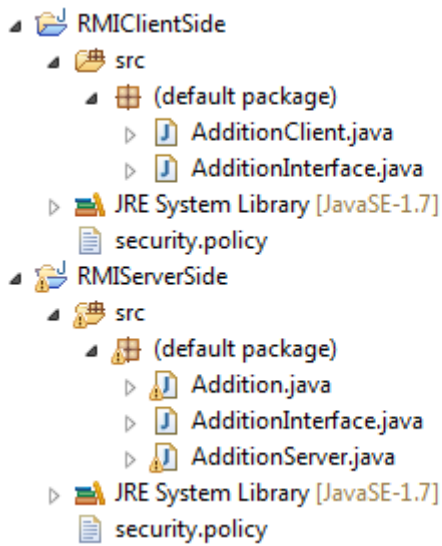
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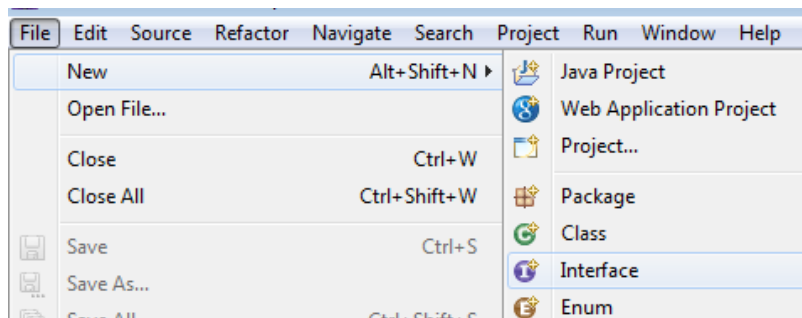


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1. Server Side

1 Let's create a new **Java Project** using Eclipse (or NetBeans or other editor you prefer), and call it : **RMIServerSide**-> Click **Finish** once done

2 Under the **RMIServerSide**, project, Select **New** -> **Interface**



3 Set the name for the interface as : **AdditionInterface** ->Click **Finish**.

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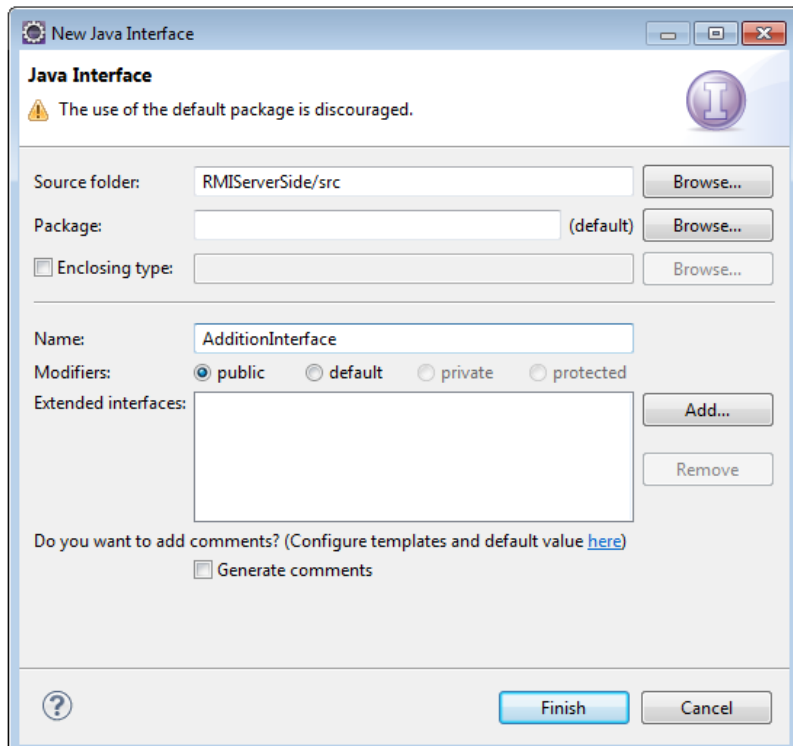
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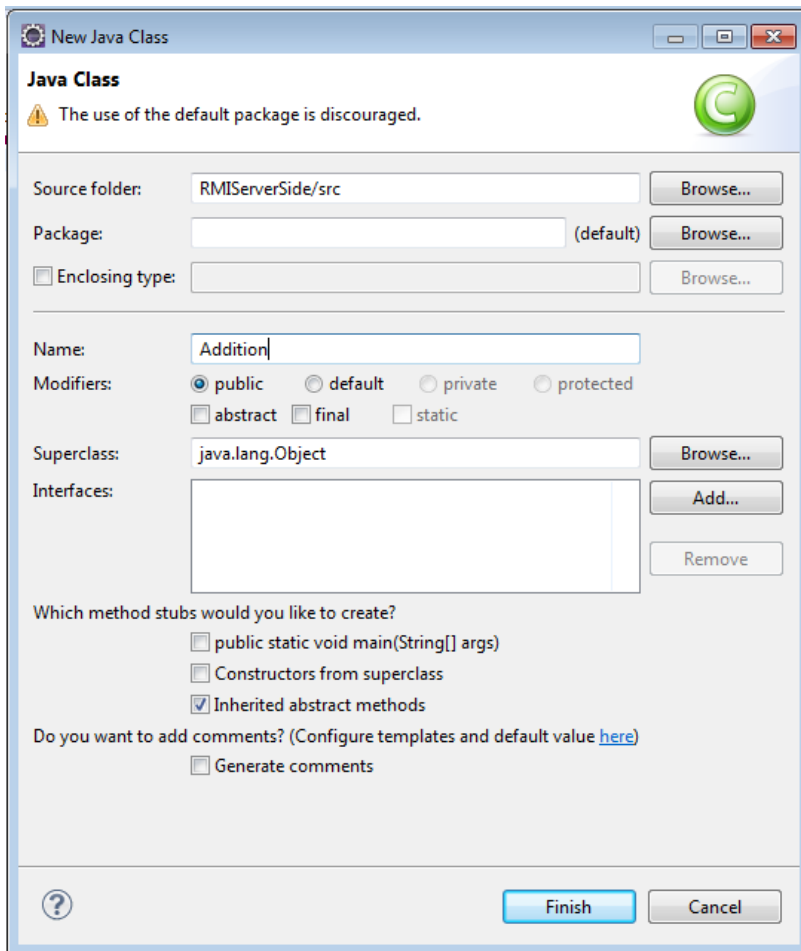
Save



4 Copy the following code into the **AdditionInterface** code.

```
1.    import java.rmi.*;
2.
3.    public interface AdditionInterface extends R
4.        public int add(int a,int b) throws R
5.    }
```

5 Select the project **RMIServerSide**, Click **New -> Class**, Set the name for the class as : **Addition**



6 Copy the following code into the **Addition** class.

```

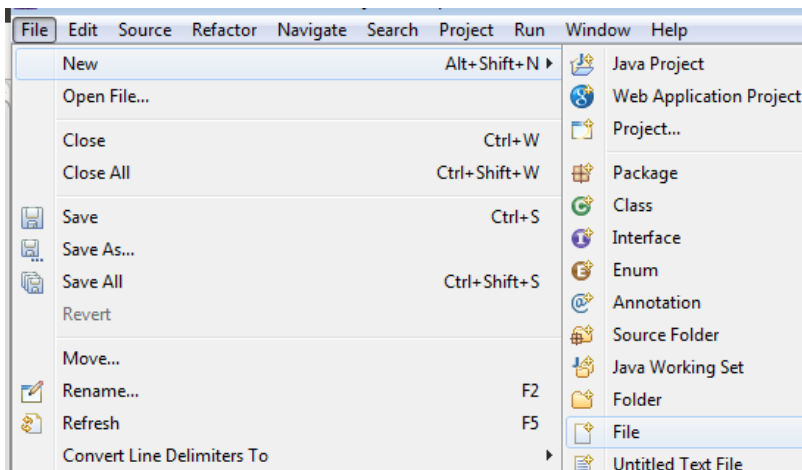
1. import java.rmi.*;
2. import java.rmi.server.*;
3.
4. public class Addition extends UnicastRemoteObject
5.     implements AdditionInterface {
6.
7.     public Addition () throws RemoteException
8.
9.     public int add(int a, int b) throws Remote
10.         int result=a+b;
11.         return result;
12.     }
13. }
```

7 Select the project **RMIServerSide**, Click **New -> Class**, Set the name for the class as : **AdditionServer**

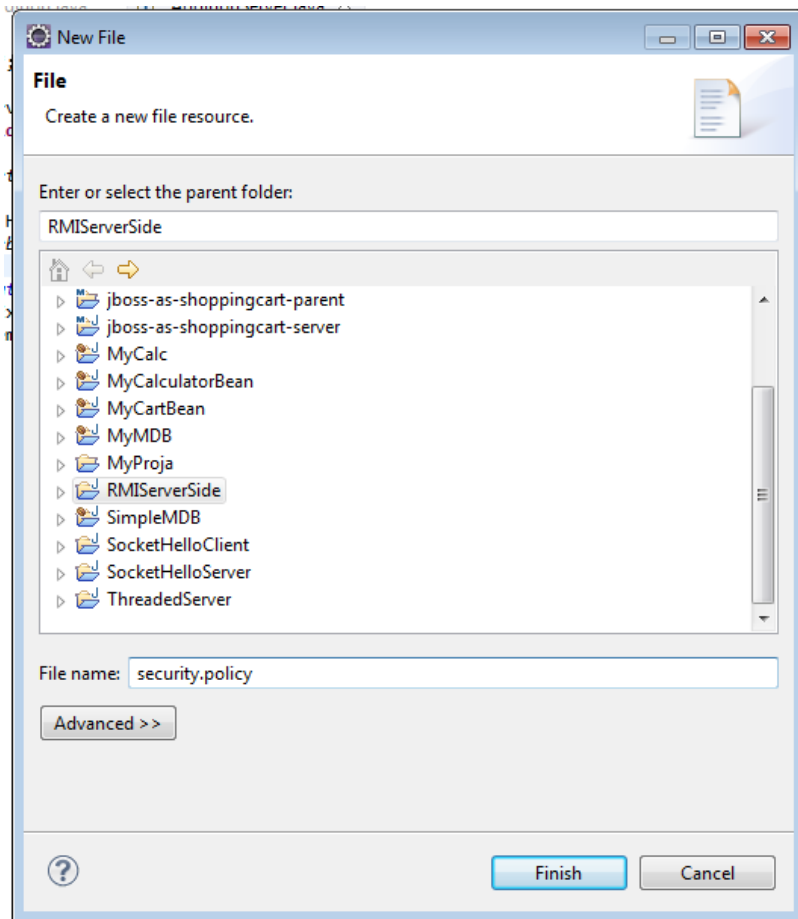
8 Copy the following code in the **AdditionServer**

```
1. import java.rmi.*;
2. import java.rmi.server.*;
3.
4. public class AdditionServer {
5.     public static void main (String[] ar
6.         try {
7.             System.setSecurityMa
8.
9.             Addition Hello = new
10.             Naming.rebind("rmi:/
11.
12.             System.out.println("
13.         }catch (Exception e)
14.             System.out.p
15.         }
16.     }
17. }
```

9 Under the **RMIServerSide**, project, Select **New -> File**



10 Set the name as : **security.policy**



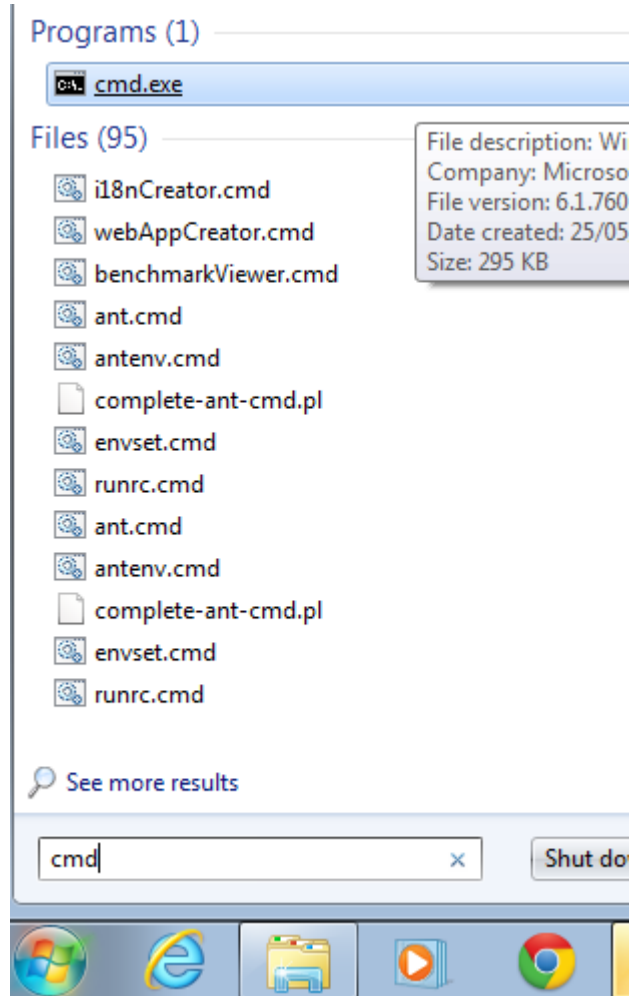
11 Copy the following text into the **security.policy** file

```
1.  grant {  
2.      permission java.security.AllPermission;  
3.  };
```

12 Compile your project through clicking Green Play button.



13 Open your CMD (DOS Console).



13 Navigate to the **bin** folder of your project. The location of your project can be known through clicking: Select the project **RMIServerSide**., click : **File -> Properties**

Resource	
Path:	/RMIServerSide
Type:	Project
Location:	C:\Users\imed\workspace\RMIServerSide
Last modified:	22 October 2013 11:01:04

Within the CMD black window, type in the full location of the bin folder as :

```
cd C:\Users\imed\workspace\RMIServerSide\bin
```

Make sure you type YOUR location, not mine

Press Enter once done.

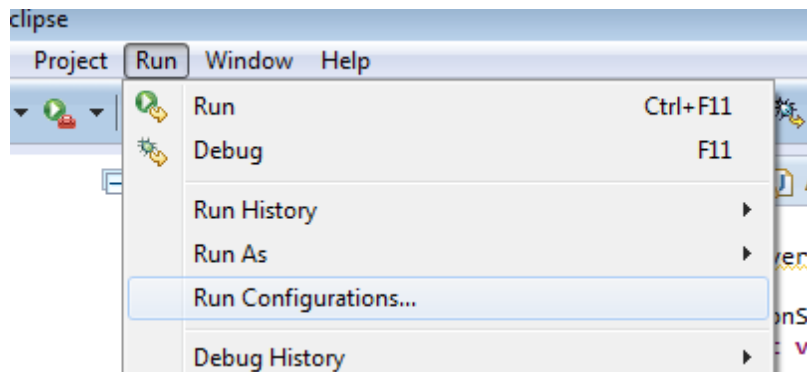
14 Run the **rmic** to generate the **stub** for the remote object **Addition**. Run the following command:

```
rmic Addition -> Press Enter
```

15 Open a **new CMD window** to start the RMI Registry. Type in directly.

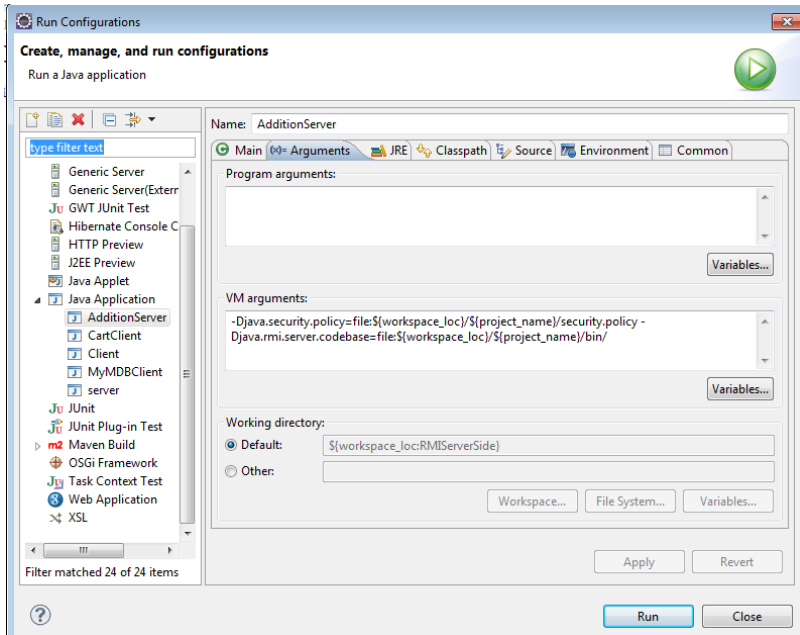
```
start rmiregistry
```

16 Let's configure Eclipse as: Select the project **RMIServerSide**., click : **Run -> Run Configurations**



17 Make sure you select the main class **AdditionServer** First, then click on **Arguments** and type in the following **VM arguments**:

```
-  
Djava.security.policy=file:${workspace_loc}/RMIServerSide/security.policy  
-  
Djava.rmi.server.codebase=file:${workspace_loc}/RMIServerSide/bin/
```

18 Click **APPLY** -> **RUN**. That's it for the server side.

2. Client Side

1 Let's create a new **Java Project** using Eclipse (or NetBeans or other editor you prefer), and call it :

RMIClientSide-> Click **Finish** once done

2 Select the project **RMIClientSide**, Click **New** -> **Interface**, Set the name for the class as : **AdditionInterface**, Click **Finish**.

3 Copy the previous code into the **AdditionInterface** which is :

```

1.    import java.rmi.*;
2.
3.    public interface AdditionInterface extends R
4.        public int Add(int a,int b) throws R
5.    }
```

4 Select the project **RMIClientSide**, Click **New** -> **Class**, Set the name for the class as : **AdditionClient**, Click **Finish**.

5 Copy the following code into the **AdditionClient** class

```
1. import java.rmi.*;
2.
3. public class AdditionClient {
4.     public static void main (String[] args)
5.         AdditionInterface hello;
6.         try {
7.             System.setSecurityManag
8.             hello = (AdditionInterf
9.             int result=hello.add(9,
10.            System.out.println("Res
11.
12.        }catch (Exception e) {
13.            System.out.prin
14.        }
15.    }
16. }
```

6 Under the RMIClientSide, project, Select New -> File -> set the name as : security.policy. Copy the following code into the security file

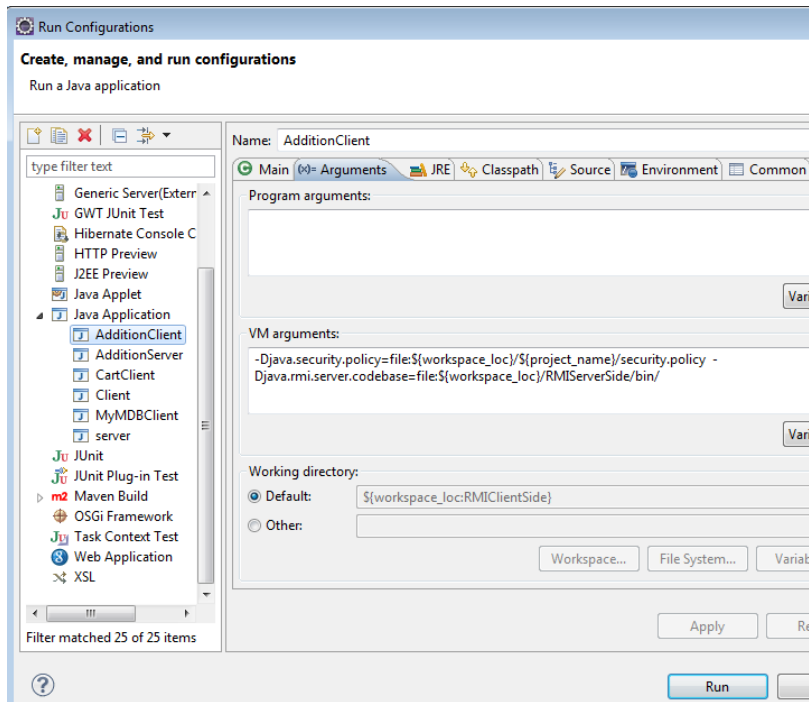
```
1. grant {
2.     permission java.security.AllPermission;
3. };
```

7 Let's configure Eclipse as: Select the project **RMIClientSide**, click : **Run -> Run Configurations**

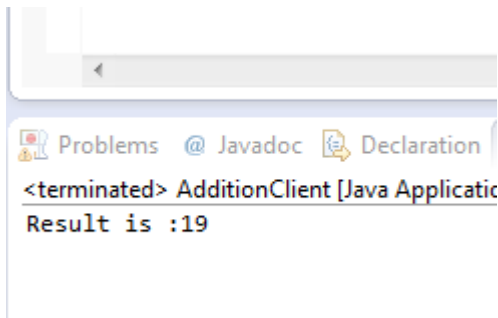
In case the AdditionClient does not show up on the left side. **Double click** on **Java Application**

8 Select The **AdditionClient** then click Arguments. Type in the following into the **VM Arguments**:

```
-
Djava.security.policy=file:${workspace_loc}/RMIClientSide/security.policy
-
Djava.rmi.server.codebase=file:${workspace_loc}/RMIServerSide/bin/
```



9 Click **APPLY** → **RUN**. That's it for the client side. The result should be shown on the console window of Eclipse.



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About Author



by **Imed Bouchrika**

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Mar 12 2014

David North

Hello! This tutorial is very helpful, but just a heads up!

In the AdditionClient class at line 9

there is a 'typo'.
The hello.add(9,10) needs a capital A on add as this is how it appears within the interfaces given throughout.
Also, if you're using a mac, rmiregistry is run in the terminal just typing 'rmiregistry'
And lastly, in the latest versions of java you don't need to do the rmic step. Stubs are generated dynamically on the fly. This came up as a warning message at that stage in the tutorial for me.
Apart from that, this tutorial has really helped me understand this stuff! Thanks!
Dave.

[Reply](#)

Apr 27 2015

Hardik

I think typo error is at
AdditionInterface.java of clientside
public int Add(int a,int b) throws
RemoteException;
make it public int add(int a,int
b)throws RemoteException;

[Reply](#)

Mar 12 2014

David North

Although interestingly, if I try and change the case of the 'A' to 'a' throughout the server and client I start getting NoSuchMethodError.
Any ideas?

[Reply](#)

Oct 19 2016

Tim de Vries

If you look carefully, you can see the capitalized 'a' (A) is in the screenshot. His code is actually all in

the camelCase form that Java developers seem to have accepted as a defacto standard.

Reply



Mar 12 2014

David North

And finally, it appears to only work when I run 'rmiregistry' whilst inside the RMIServer 'bin' folder.... can anyone shed any light on this? I found it by chance...

Reply



May 24 2015

meself

Your rmiregistry needs to know where the classes are. If you do not specify a classpath (to the registry), it won't work. By default, the current folder is added to the classpath.

Reply



Mar 17 2014

Diana

Hi,
It really work great thanks, it help me to undestand the concept of rmi, but what do I need to change to make the server part works on a different computer?

Reply



May 12 2014

ThienAn

I got it. Thank you very much.

Reply

Ralf



Oct 08 2014

Thank you for the awesome tutorial.
I would like to highlight that I was getting the following exception:
java.rmi.ServerException:
RemoteException occurred in server thread; nested exception is:
java.rmi.UnmarshalException: error unmarshalling arguments; nested exception is:
java.lang.ClassNotFoundException:
Addition_Stub
After much brainstorming and numerous Google searches, I found that 'rmiregistry' should be run from the location of the codebase. This solved my problem.
I am not sure whether you have missed this additional information at Point 15 (Server side) . If you have missed, please edit the information.
Thanks again!

Reply



Oct 13 2014

Mohammed

hello ,
thank you for this tutorial , but i have a problem in the command (cmd)
C:\Users\Mohammed\Documents\workspace
rmic Addition
'rmic' n'est pas reconnu en tant que commande interne
ou externe, un programme exécutable ou un fichier de commandes.
i didn't know how to fixe it
i will appreciate your help
thx

Reply



Oct 19 2014

Viviane

Had the same problem , it is a problem in the path of your jdk folder . Try to do what the guy said in this

tutorial
<http://www.coderanch.com/t/188748/java-developer-SCJD/certification/RMIC-compiler>

Reply



Oct 18 2014

follower

hello ...

i have a question ...

Is it right that i right :

-

Djava.security.policy=file:E:/java/workspace

-

Djava.rmi.server.codebase=file:E:/java/work
for serverSide ? or i should right exactly
this :

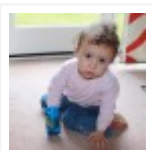
-

Djava.security.policy=file:\${workspace_loc}

-

Djava.rmi.server.codebase=file:\${workspace
?

Reply



Nov 12 2014

Imed Bouchrika

Another tutorial without codebase,
security policy stuff:

<http://www.ejbtutorial.com/java-rmi/group-chat-example-using-java-rmi-with-a-graphical-user-interface>

Reply



Dec 08 2014

Priya

Great .very helpful.

Reply

VADDA



Jan 27 2015

when i compiled the server side project
i got the following error
Addition Server failed:
java.security.AccessControlException:
access denied
("java.net.SocketPermission"
"127.0.0.1:1099" "connect,resolve")

Reply



Mar 06 2015

Ian

Your registry isn't running. Make sure
you've ran 'start rmiregistry' on
Windows or just 'rmiregistry' on
Linux from /{serverFolder}/bin before
running the Server.

Reply



Oct 24 2015

M.I.G

I becomes this Exception
Addition Server failed:
java.security.AccessControlException
access denied
("java.net.SocketPermission"
"127.0.0.1:1099"
"connect,resolve")
I've start the rmiregistry under
2001 and write this
Naming.rebind("rmi://localhost/ABC:2
Hello);
But it's doesn't work!
HAS everybody an idear?

Reply



Dec 09 2015

Winny

Hi,
I have the same problem. After
read the post with the link
bellow. I changed the port and it
work

<http://stackoverflow.com/questions/rmi-serverexception-java-lang-classnotfoundexception-org-prog-rmi-rmiser>
And it work.

Reply



Feb 05 2016

INAZIO

I've the same problem. In security.policy file, you need to add ; at the end of the code. I forgot to write it, I fix it and now the project founds without errors 😊

Reply



Dec 22 2015

artem

Check for the actual location of security.policy
If you follow the tutorial, it might end up in the src folder.
Try this:

-

Djava.security.policy=file:\${workspace}_l

Reply



Mar 26 2015

tritho

I get the following error when i try to run the RMIClientSide project, everything is set and done according to instructions. AdditionClient exception:
java.lang.ClassCastException:
com.sun.proxy.\$Proxy0 cannot be cast to AdditionInterface

Reply

Hardik



Apr 27 2015

I started rmiregistry and run serverside code.. Output is properly coming as "Addition Server is running"..

Now followed clientside steps as mentioned above and when I run clientside I am getting following error in eclipse:

```
Exception in thread "main"
java.lang.NoSuchMethodError: stub
class initialization failed
at Addition_Stub.(Unknown Source)
at
sun.misc.Unsafe.ensureClassInitialized(Na
Method)
at
sun.reflect.UnsafeFieldAccessorFactory.new
at
sun.reflect.ReflectionFactory.newFieldAcce
at
java.lang.reflect.Field.acquireFieldAccessor
at
java.lang.reflect.Field.getFieldAccessor(Fiel
at
java.lang.reflect.Field.getLong(Field.java:605
at
java.io.ObjectStreamClass.getDeclaredSUID
at
java.io.ObjectStreamClass.access$700(Object
at
java.io.ObjectStreamClass$2.run(ObjectStre
at
java.io.ObjectStreamClass$2.run(ObjectStre
at
java.security.AccessController.doPrivileged
Method)
at java.io.ObjectStreamClass.
(ObjectStreamClass.java:468)
at
java.io.ObjectStreamClass.lookup(ObjectStr
at
java.io.ObjectStreamClass.initNonProxy(Obj
at
java.io.ObjectInputStream.readNonProxyDe
at
java.io.ObjectInputStream.readClassDesc(O
at
```

```
java.io.ObjectInputStream.readOrdinaryObj  
at  
java.io.ObjectInputStream.readObject0(Obj  
at  
java.io.ObjectInputStream.readObject(Objec  
at  
sun.rmi.registry.RegistryImpl_Stub.lookup(  
Source)  
at  
java.rmi.Naming.lookup(Naming.java:101)  
at  
AdditionClient.main(AdditionClient.java:10)  
Also tried searching regarding this error  
but no luck.
```

[Reply](#)

Apr 28 2015

Hussy

rmic Addition is not running on my machine!!!

[Reply](#)

Aug 10 2015

Gary

Hello, I have a question.
I've been following your guide step by step, but when I run the server side (number 18) i get this error : Connection refused to host: 192.168.0.102;
do you know how to solve it? Thanks in advance.

[Reply](#)

Aug 26 2015

user1209

Hi, i wrote the server side code , started rmiRegistry etc, and when i ran the code i got ClassNotFoundException.
Addition Server failed:
java.rmi.ServerException:
RemoteException occurred in server thread; nested exception is:

java.rmi.UnmarshalException: error unmarshalling arguments; nested exception is:
java.lang.ClassNotFoundException: AdditionInterface
Can somebody tell me why i am getting this?

Reply



Sep 22 2015

dhanush raja

Error: Main method not found in class AdditionClient, please define the main method as:
public static void main(String[] args)
or a JavaFX application class must extend javafx.application.Application
.....how to solve????????????

Reply



Jan 29 2016

Multra Arun

hi, what if instead of the command prompt i need to make gui communication between client and server ? what must i do in order to achieve that

Reply



Feb 02 2016

sweety

i getting error
HelloClient exception:
java.rmi.UnmarshalException: error unmarshalling return; nested exception is:
java.lang.ClassNotFoundException: Addition_Stub (no security manager: RMI class loader disabled)
if i m running rmiregistry from bin folder of rmiserverside.
How to do run client file.

[Reply](#)

Feb 02 2016

sweety

if i m running rmiregistry outside bin folder of serverside then i m getting same error

HelloClient exception:

java.rmi.UnmarshalException: error unmarshalling return; nested exception is:

java.lang.ClassNotFoundException: Addition_Stub (no security manager: RMI class loader disabled)
after running serverside Addition class

[Reply](#)

Feb 22 2016

Subhadeep

I am having a problem while using the command prompt...

when i am writing the start rmiregistry it says that system cannot find the file rmiregistry
please give me a solution to this

[Reply](#)

Oct 10 2016

Krimi

HelloClient exception:

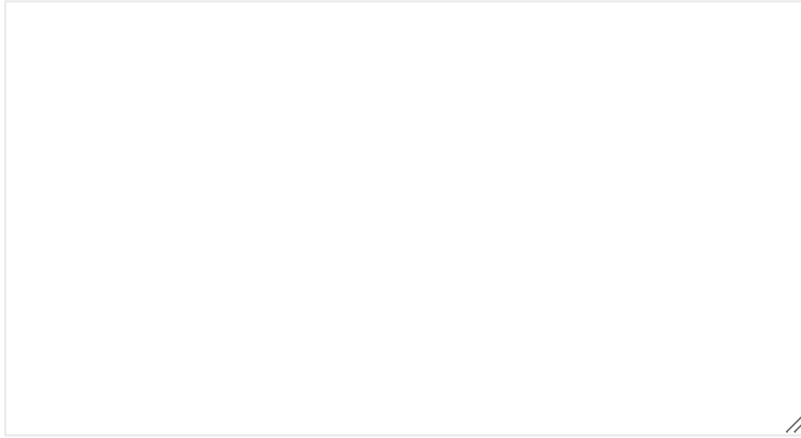
java.rmi.ConnectException: Connection refused to host: localhost; nested exception is:

java.net.ConnectException: Connection refused: connect

I got this error in client side ! Can you please help?

[Reply](#)

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