Velammal College of Engineering and Technology, Madurai-09. Department of Computer Science and Engineering



Regulation 2013

B.E CSE - IV YEAR - VII SEMESTER

CS6712 - Grid and Cloud Computing Lab

Manual



ANNA UNIVERSITY, CHENNAI-600025

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Objective and Outcome of the Course

The student should be made to:

- Be exposed to tool kits for grid and cloud environment.
- Be familiar with developing web services/Applications in grid framework
- Learn to run virtual machines of different configuration.
- Learn to use Hadoop

Upon successful completion of this course, students will be able to:

- **CO1:** Develop web services and portlet application [K3]
- **CO2:** Build applications using REST API [K3]
- **CO3:** Develop application with security mechanisms [K3]
- **CO4:** Demonstrate the virtualization concepts in cloud environment [K3]

CO5: Implement a single node cluster environment and map reduce concept in Hadoop framework [K3]

Syllabus

GRID COMPUTING LAB:

- 1. Develop a new Web Service for Calculator.
- 2. Develop new OGSA-compliant Web Service.
- 3. Using Apache Axis develop a Grid Service.
- 4. Develop applications using Java or C/C++ Grid APIs
- 5. Develop secured applications using basic security mechanisms available in Globus Toolkit.
- 6. Develop a Grid portal, where user can submit a job and get the result. Implement it with and without GRAM concept.

CLOUD COMPUTING LAB:

- 1. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.
- 2. Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.
- 3. Install a C compiler in the virtual machine and execute a sample program.
- 4. Show the virtual machine migration based on the certain condition from one node to the other.
- 5. Find procedure to install storage controller and interact with it.
- 6. Find procedure to set up the one node Hadoop cluster.
- 7. Mount the one node Hadoop cluster using FUSE.
- 8. Write a program to use the API's of Hadoop to interact with it.
- 9. Write a word count program to demonstrate the use of Map and Reduce tasks.

Prerequisite of the course

- Core and Advanced Java Programming
- Web Services

Requirements

- Netbeans IDE 8.2
- Cloud Simulator 3.0.3

Instructions for Assessment

- The manual contains the code for all the model exercises that has been prepared and executed onNetbeans IDE 8.0, Cloud Simulator and appropriate supporting softwares and frameworks.
- All the laboratory exercises should be implemented on platform mentioned by the Instructor. The change of platform for implementation is strictly banned.
- All the students are instructed to maintain a hard copy of the manual, separate notebook and file folder for this course.
- When you come to lab, you have to prepare the pseudo code for your exercises on spot and then implement the same on above mentioned platform. The pseudo code must be prepared on the note book and all the observations of your implementation must be recorded in the note book, once you finished your exercises. At the end of the laboratory classes, the note book must be signed by the faculty in charge and assessment will be done.
- When you are coming for the laboratory classes, the completed record sheets for the previous class exercises must be produced for signature of faculty in charge except for first class of the course.
- All the exercises need to be completed in the respective classes itself. The deadline will not be extended at any circumstances. All the assessment will be done in the same class itself.
- You are encourages to do all the necessary preparation before you come to the lab. Treat every lab class as lab examination.
- Every exercise will be assessed for maximum of 25 marks.

1. DEVELOP A NEW WEB SERVICE FOR CALCULATOR

AIM

To develop a web service for calculator in java using Netbeans IDE

SOFTWARE USED

- Netbeans IDE 8.2
- JDK 8.1
- Glassfish Web Server

PROCEDURE

Step 1: Create a Java Web Project

- Open Netbeans IDE 8.2
- Click on New Project and choose Java Web -> Web Application
- Enter the Project Name: CalculatorWS, using the default settings and then click on "Finish". Now the Project has been created.

Step 2: Create a Web Service

- Now go to the Project Tree Structure on the left side of the window.
- Right click on the project and select "New" and then choose "Web Service"
- Specify web service name "CalWS" and package name "CalculatorWS". Click on "Finish".
- Open CalWS.java file, replace the original hello() function with the following code:

@WebMethod(operationName = "add")

```
public String add(@WebParam(name = "value1") String
value1,@WebParam(name="value2") String value2 ) {
```

```
float value=Float.valueOf(value1)+Float.valueOf(value2);
```

```
return (Float.toString(value));
```

}

Similarly write the code for subtraction, multiplication, division and other calculator operations. Refer the program section for full program.

• Now the web service is created.

Step 3: Deploy and Test Web Service

- Right click on the project and select "Deploy"
- This is to deploy all the web services in this project. If success, you will see:

	return (Float.toString(value));
alWS 📎	
t 🖸	
	Retriever Output 💿 Java DB Database Process 🛇 GlassFish Server 4 🛇 CalculationWS (run-deploy) 🗧
ueps-mour	ure-jai.
deps-ear-	-jar:
deps-jar	
library-	inclusion-in-archive:
library-:	inclusion-in-manifest:
compile:	
compile-	isps:
Undeploy	ing
In-place run-deplo	<pre>deployment at /Users/liuxumin/NetBeansProjects/CalculationWS/build/web by:</pre>

• To test the web service, right click on the service and select "Test Web Service"



You will see:



This form will allow you to test your web service implementation (<u>WSDL File</u>)
To invoke an operation, fill the method parameter(s) input boxes and click on the button labeled with the method name.

Methods:
public abstract java.lang.String calculationws.CalWS.addition(java.lang.String.java.lang.String)
addition (

Right Click on the project and select "Clean and Build", a war file will be automatically generated under "dist" sub-directory.

PROGRAM (Use the below given program for CalWS.java)

package CalculatorWS;

```
import javax.jws.WebService;
import javax.jws.WebMethod;
import javax.jws.WebParam;
/**
*
* @author poonkuntran
*/
@WebService(serviceName = "CalWS")
public class CalWS {
  @WebMethod(operationName = "add")
  public
               String
                           add(@WebParam(name
                                                                "value1")
                                                                                String
                                                        =
value1,@WebParam(name="value2") String value2) {
    float value=Float.valueOf(value1)+Float.valueOf(value2);
    return (Float.toString(value));
}
@WebMethod(operationName= "sub")
    public
                     String
                                     sub(@WebParam(name=
                                                                       "value1")String
value1,@WebParam(name="value2")String value2){
float value=Float.valueOf(value1)-Float.valueOf(value2);
return (Float.toString(value));
}
    @WebMethod(operationName= "mul")
    public
                                     mul(@WebParam(name=
                                                                       "value1")String
                     String
value1,@WebParam(name="value2")String value2){
float value=Float.valueOf(value1)*Float.valueOf(value2);
return (Float.toString(value));
}
    @WebMethod(operationName= "div")
```

```
public
                     String
                                      div(@WebParam(name=
                                                                        "value1")String
value1,@WebParam(name="value2")String value2){
float value=Float.valueOf(value1)/Float.valueOf(value2);
return (Float.toString(value));
}
    @WebMethod(operationName= "mod")
    public
                     String
                                     mod(@WebParam(name=
                                                                        "value1")String
value1,@WebParam(name="value2")String value2){
float value=Float.valueOf(value1)%Float.valueOf(value2);
return (Float.toString(value));
}
    @WebMethod(operationName= "cube")
    public String cube(@WebParam(name="value1")String value1){
float value=Float.valueOf(value1)*Float.valueOf(value1)*Float.valueOf(value1);
return (Float.toString(value));
}
    @WebMethod(operationName= "square")
    public String square(@WebParam(name= "value1")String value1){
float value=Float.valueOf(value1)*Float.valueOf(value1);
return (Float.toString(value));
}
    @WebMethod(operationName="sin")
    public String sin(@WebParam(name="value1")String value1){
      double value=Math.sin(0);
return (Double.toString(value));
}
     @WebMethod(operationName="cos")
    public String cos(@WebParam(name= "value1")String value1){
```

double value=Double.valueOf(Math.cos(0));

```
return (Double.toString(value));
```

}

@WebMethod(operationName="sqrot")

public String sqrot(@WebParam(name= "value1")String value1){

double value=Math.sqrt(4);

```
return (Double.toString(value));
```

}

OUTPUT

public abstract java.lang.String calculator.Cal.add(java.lang.String.java.lang.String) add () public abstract java.lang.String calculator.Cal.sin(java.lang.String) sin () public abstract java.lang.String calculator.Cal.cos(java.lang.String) cos (public abstract java.lang.String calculator.Cal.sub(java.lang.String.java.lang.String) sub (0 public abstract java.lang.String calculator.Cal.mod(java.lang.String,java.lang.String) mod (D public abstract java.lang.String calculator.Cal.square(java.lang.String) square () public abstract java.lang.String calculator.Cal.sqrot(java.lang.String) sqrot (0 public abstract java.lang.String calculator.Cal.cube(java.lang.String) cube () public abstract java.lang.String calculator.Cal.mul(java.lang.String.java.lang.String)

0

mul (

Method paramete	rr(s)
Type	alue
java lang String Ø	
Method returned	
java.lang.String : "	1.0"
SOAP Request	
xml versi<br <soap-e< td=""><td>on="1.0" encoding="UTF-8"?><s:envelope "="" calculator="" http:="" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:soap-env="http://schema
NV:Header/></td></tr><tr><td><S:Body</td><td></td></tr><tr><td><ns.</td><td><pre>2:cos xmlns:ns2="></s:envelope></td></soap-e<>	on="1.0" encoding="UTF-8"?> <s:envelope "="" calculator="" http:="" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:soap-env="http://schema
NV:Header/></td></tr><tr><td><S:Body</td><td></td></tr><tr><td><ns.</td><td><pre>2:cos xmlns:ns2="></s:envelope>
	<value1>0</value1>
<td>s2:cos></td>	s2:cos>
<td>y></td>	y>
<td>e></td>	e>

CONCLUSIONS

The web service has been created for calculator operations and it is deployed and tested in Java Web Application using Netbeans IDE.

2. DEVELOP A OGSA COMPLIANT WEBSERVICE

Aim

To develop new open grid service architecture- complaint web service in java using NetBeans IDE 8.2.

Procedure

To solve the following tasks have to be performed:

- 1. Use the netbeans
- 2. Make a stud table in the jdbc:derby database
- 3. Create a Web project
- 4. Develop a Web Service program for student
- 5. Create a exam operation in the web service
- 6. Add enterprise resources for the database
- 7. Edit source code
- 8. Build & deploy the project
- 9. Test the web service **Derby database**

This is a small database software bundled with Netbeans in glassfish server. It is easy to create a database, create a table, make the queries over it. User can connect easily the enterprise program, web service program and web program with derby database software.

Connecting database

- Open the Netbeans software
- Navigate to the services tab
- Open database folder and select the derby database
- Right Click and select start the server as given below in figure 1



- Select the sample database or you can create one
- Right Click and Select Connect as given below in Figure 2.
- It will connect to the sample database



- Right Click and select Create table as given
- It will Open a dialog box as shown below in Figure 3



- In this dialog box give the table name as stud
- Now add the columns
- Add the two columns
- Roll with data type numeric and Name with data type char
- Do all steps as shown below in Figure 4.
- It create a stud table a sample database

Cre	ate Tab	le					X
Iable n	ame: stud	1			Owner	r: APP 💌	
Key	Index	Null	Unique	Column name	Data type	Size	Add column
	~			roll	NUMERIC	0	Remove
		2		name	CHAR	12	[
3						×	
						ОК	Cancel

Figure. 4

Creating Web Service project

- Create a new web project
- Give a name as jaax2
- Select the server as glassfish and java EE web 6 version

• Click on the finish as shown below in Figure 5

New Web Application		New Web Application	
Steps	Name and Location	Steps	Server and Settings
Choose Project Name and Location Server and Settings Frameworks	Project (game: jac2 Project (postion: Cl'Documents and Settings/roseindia/My Documents/MetBearuProjects Browse Project (polder: Cl'Documents and Settings/roseindia/My Documents/MetBearuProjects/jac2 Browse	Choose Project Name and Location Server and Settings Frameworks	Add to Enterprise Application: <a>line> Server: GassFish Server 4.1.1 Jana EE Version: Jana EE 7 Web
	Ute Dedicated Folder for Storing Ubranes Utranes Folder Dff erent users and protects can share the same concilators (are Help for details) Set as Main Project		LonextPant Jana EE 5 Jana EE 5
A.A.			
	<box next=""> End Cancel Hep</box>		<back next=""> Frish Cancel Hep</back>

Figure 5

Create a web service

- Right Click on the project
- Select New->Web Service
- Type name as stud
- Type package as pack1 as shown below in Figure 6

(cps	Name and Location	
Choose File Type Name and Location	Web Service Name: stud	
	Project: jax2	
	Location: Source Packages	~
	Pad <u>kage:</u> padk1	~
	Create Web Service from Scratch	
	Create Web Service from Existing Session Bean	
	Enterprise Bean:	towse
the state		
nari.		
in di		
in and		
	< Back Next > Enish Cancel	Help

• This will create a stud Web Service class

Adding operation

- In the design view Click on the Add Operation
- It will generate a Add operation Dialog Box as shown below n Figure. 7



- In the pop up dialog box give the operation name and parameters
 - Operation name exam
 - Return type String
 - Parameters name roll and name
- Follow the steps according to Fig 8 given below

🗊 Add Ope	ration			
<u>N</u> ame:	exam			
Parameters	Exceptions	ing		Browse
Name		Туре	Final	Add
roll		int		Remove
name		java.lang.String		
				Up
				Down
				OK Cancel
				Figure.

Now click source->It creates a full web service class as shown below

package pack1;

import javax.jws.WebMethod; import javax.jws.WebParam; import javax.jws.WebService;

@WebService()
public class stud {

```
@WebMethod(operationName = "exam")
public String exam(@WebParam(name = "roll")
int roll, @WebParam(name = "name")
String name) {
//TODO write your implementation code here:
return null;
}
```

Adding Database capabilities

- Database and table created above is used in the web service
- Right Click in the code section of web service and click Insert Code(fig 9)->list display as in figure 9.1 and click use database in Figure 9.1





🗊 jaax - NetBeans IDE 8.2	THE ST. S. March 140	in bally sales
File Edit View Navigate Source Refactor Run Debug	Profile Team Tools Window Help	Q- Search (Ctrl+I
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Projects № Files Services Image: Column Service Image: Column Service Image: Column Service Image: Column Service	Start Page Image index intitiation in the interview of the int	<pre>- "exam") ram(name = "name") String txt) { + " !"; </pre>
hello - Navigator %	34 - } 35 }	
Stud Stud O exam(String name) : String O hello(String txt) : String	36 v pack1.stud > Output - Java DB Database Process *	

Figure 9.1

- Fig 9.2 displayed and then click Add
- Add the data source reference
- Type Reference name data1
- Select jdbc/sample Server Data Source as shown below in Fig 10.

Choose Databas	e	×
Reference:		✓ Add
Service Locator Str	ategy je Lookup Code	
Existing Class		
Empty or not va	Id reference choosen	Cancel Help Figure 9.2
Minimized Add Data Source R	eference	
Reference Name:	data1	
O Project Data Sources:		<u>Add</u>
() Server Data Sources:	jdbc/sample	~
Copy Selected Dat	Source To Project	
		ок Сапсе Figure. 10

• Click on Ok as shown below in Fig. 11.

Choose Database	
Reference: data1 [jdbc:derby://localhos	:t:1527/sample]
Service Locator Strategy	
<u>E</u> xisting Class	
	OK Cancel Help Figure. 11

• This creates Data Source reference variable data1 at the top of method

• Now make changes in the code for database connection as shown in code package pack1;

 \rightarrow Add this statement

 $--\rightarrow$ Add this statement

import java.sql.Connection; import java.sql.PreparedStatement; import javax.annotation.Resource; import javax.jws.WebMethod; import javax.jws.WebParam; import javax.jws.WebService; import javax.sql.DataSource;

@WebService()
public class stud {
 @Resource(name = "data1")
 private DataSource data1;

```
@WebMethod(operationName = "exam")
public String exam(@WebParam(name = "roll")
int roll, @WebParam(name = "name")String name) {
String status="record not inserted";
try {
Connection con=data1.getConnection();
PreparedStatement ps=con.prepareStatement("INSERT INTO stud VALUES(?,?)");
ps.setInt(1,roll);
ps.setString(2,name);
int i=ps.executeUpdate();
if(i!=0) {
status="record inserted";
}
}
catch(Exception e){
System.out.println("error in strong data"+e);
```

```
return status;
```

```
}
```

Running the project

- Build the above created project
- Deploy the project on the server as shown below in Figure. 12
- This deploys the project on the server
- We can now run our Web Service



- Right Click on Web Service stud
- Select Test Web Service as shown below in Figure. 13

fån Edit Vanv	Nevigate Source Ref.	actor Build Rur	Profile Versioning Tools Window Help	
1 1		90	befault config> 💌 🚏 🦉 👂 📅 + 🚱 +	
Projects 41 :	Files	Services	📝 index.pp = 🧾 stud.jeve 🔺 📄 505. Command 1 🔹	
🗄 🥎 E38Module	1	5735300 O	Source Design 10 1 - 1 - 9 9 9 8 8 9 4 9 9 9 9	11 12 -
EXBWebSe	rvice		1 package packts	
e 🕘 jacz			2	
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B- CO WE	8-94 ⁻		19	
- I ind	ex.jsp		11 [1] [/***/]	
Web S	ervices		15 8WebService()	
	Open		16 public class stud (-
a Con	Rebech Service		17 BResource(name = "datai")	
Servi			18 private DataSource datai;	
10 100 Test	Add Operation		19	
in the less	Test Web Service		20 @WebMethod(operationName = "exam")	
Tert	A CHILD DY LAURAN	2011 C	21 public String exam(@WebParsen(name = "coll")	
E B Wydw	Edit Web Service Attrib	butes	22 [] int roll, 8VebParam(name = "name")String name)	د
E A Jacoba	Configure Handleys		23 String status="record not inserted";	
Register			24 try (
a Contract	Generate and Copy WS	50L	25 Connection con=detai.getConnection();	
a a usebiarvi	Delete	Delete	26 PreparedStatement ps=con.prepareStatement	ent ("INSERT INTO exam VAL1
			<pre>27 ps.setInt(1,roll);</pre>	
stud - Navigat	Properties	1	<pre>28 ps.setString(2, name);</pre>	
Hembers View			<pre>29 int i=ps.executeUpdate();</pre>	
Ei 🏫 stud			30 1f(1/=0) {	
- exam(nt roll, Sbring name) : Stri	ing	31 status="record inserted";	
data1	DetaSource		32	
			33)	
			34 catch(Exception e)(1.2 M I
			35 System.out.printin/"error in strong da	ra_+e);
			36	
			37 return status;	×.
	The second se		4	2
94 II (6)	🗃 🙀 🕫		16:20 INS	
Output	(TTP Monitor		6 - 9 W	
			120	
			Dep	loying jar.2

- It open Web Service in the browser
- Give the 1 and jack in text boxes
- Text boxes are actually arguments of web method
- Click on exam button as shown below in Fig. 14



studService Web Service Tester

This form will allow you to test your web service implementation (WSDL File)

To invoke an operation, fill the method parameter(s) input boxes and click on the button labeled with the method name.

Methods :

14

public abstract java.lang.String pack1.Stud.exam(int.java.lang.String) exam (1 .jacki)

Figure.

- Exam Buttons are actually method name of the Web Service
- This will result the value with SOAP request and SOAP response, As shown below in Figure 15.
- It will insert the values in the Derby Database table



- Check the inserted values in the table
- Right Click on the stud table in derby database
- Select View Data as shown below in Figure 16.
- It shows the inserted data as shown below in Figure 17.



Figure 16



Figure 17

Client Web Service //create a new web application

- Take a new Web Application Project
- Type name jax2Client
- Click on Next as shown below in Figure. 18

and Resident	Name and Local	tion	
Choose Project Name and Location	Project Name:	jax2Client	
3. Server and Settings	Project Location:	C:\Documents and Settings\roseindia\My Documents\VietBeansProjects	Browse
 Frameworks 	Project Epider:	C-[Documents and Settings]roseindia]My Documents[NetBeansProjects[]av2Client	
	Use Dedicated	Folder for Storing Libraries	
	Obristies Folder)		Btowse
in de			
	_	<book next=""> Enth Cancel</book>	Help
teer	Convex and Cottings		
. Choose Project	Add to Enterprise Apolic	tation: (Mone> v	
Name and Location			
Frameworks	Server: Glass	Fish Server 4.1.1	
	Java EE Version: Java	EE 7 Web 👻	
		Æ 7 Web	
	Context Path: Java J Java J Java J	EE Web EE 5	

- Right Click on the project jax2Client.
- Select the New->other->in categories ->click->Web services-> in file type-> click
 Web Service Client-> click next-> as in fig 19
- It creates a dialog box for WSDL and Client Location



- Now select either the project or give the WSDL URL
- Click on Next as shown below in Figure. 20
- Click on the Finish Button If you select wsdl URL mean

Steps	WSDL and Client Location		
 Choose File Type WSDL and Client Location 	Specify the WSD	L file of the Web Service.	Browse
	O Local File:		Browse
	WSDL URL:	http://localhost:8080/jax2/studService?WSDL	Set Proxy
14. J. 1	P <u>a</u> ckage:	<pre>cdefault package></pre>	
	Client Style:	JAX-W5 Style	-
	Generate Di	spatch code	

Figure. 20

Or if you select project tab and browse as in fig 20.1

	চ ∗ ত ≑	Ex	2 - Word (Product Activation Failed)	? 📧 – 🗗 🗙
FILE	HOME INSERT DES	IGN PAGE LAYOUT REFERE	NCES MAILINGS REVIEW VIEW	kavitha s 👻 🔍
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	trojecta w Trica se trojecta w Trica se	Steps	WSDL and Client Location	
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			 Enter the URL of the service you wish to use. 	631) start
			< <u>B</u> ack Next > Einish Cancel	
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dient1.jsp	3 C₁ ⊡ ⊕ Jax2clent 4 At ⊖ ⑨ student		
Source Packages Generated Sources (jax-ws)	6 Ender		
🗈 😼 Libraries	8 < DOCI		
Web Service References	9 🔁 <html;< td=""><td></td><td></td></html;<>		
(±)- (≥) Configuration Files	10 🗁 <2		
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	Copying 6 files to C:\Users\SEETHARAMAN K S\E	ocuments\NetBeansProjects\jax2client\build\generated-	sources\jax-ws
	BUILD SUCCESSFUL (total time: 1 second)		
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Client.jsp

- Now make a Client.jsp file
- Right Click on the Project jax2Client
- Select NewàJsp file
- Give the name as Client1.jsp
- Right Click in the code of Client1.jsp
- Select Web Service Client Resources as shown below in Figure. 21

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		Code Folds Select in	
	17-6 05	Web Service Clarit Resources	Call Web Service Operation

Figure. 21

Select the operation in the Client project jax2ClientàstudServiceàstudPortàexam
As shown below in Figure. 22

Select Operation to Invoke		
Available <u>W</u> eb Services:		
jax2Client Jax2Client Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService Jax2Client StudService StudServ		
	OK Cancel	Figure, 2

- The above steps generates code in Client.jsp
- It gives the stud Web Service object, Stud port and operation name code
- In two arguments name and roll initialize the value.

As shown below in Figure. 23.



Figure. 23

Running The Client file

- Deploy the jax2Client project
- Right Click in Client.jsp and select Run Client.jsp
- As shown below in Figure. 24.



Figure. 24

- It runs the file in the Internet Browser
- It gives the status message record inserted
- In case of failure it will display record not inserted

Aas shown below in Figure. 25

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🔚 Creating a Single Web Serv. 👔 📝 Method mocistion trace 👘 📰 studier web Servic	a Ta 🔐 🖉 http://locah_dService?#SDL 🖉 35	P Page 🚺 🔹 -
Result = record inserted		

Figure. 25

- On running the Client.jsp it inserts the value into the table
- To view the table data Right Click on the stud table in sample database in derbyIt fetches the records and display it in table as shown below in Figure 26

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PROGRAM

Stud.java

package student;

import java.sql.Connection;

import java.sql.PreparedStatement;

import javax.annotation.Resource;

import javax.jws.WebService;

import javax.jws.WebMethod;

import javax.jws.WebParam;

import javax.sql.DataSource;

@WebService(serviceName = "stud")

public class stud {

@Resource(name = "data1")

private DataSource data1;

@WebMethod(operationName = "exam")

```
public String exam(@WebParam(name = "roll") int roll, @WebParam(name = "name")
String name) {
```

String status="record not inserted";

try {

Connection con=data1.getConnection();

PreparedStatement ps=con.prepareStatement("INSERT INTO stud VALUES(?,?)");

ps.setInt(1,roll);

ps.setString(2,name);

int i=ps.executeUpdate();

if(i!=0) {

status="record inserted";

}

```
}
 catch(Exception e){
 System.out.println("error in strong data"+e);
 }
 return status;
 }
}
Client.jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>JSP Page</title>
  </head> <body> <hr/>
  <%
  try {
       student.Stud_Service service = new student.Stud_Service();
       student.Stud port = service.getStudPort();
       int roll = 2;
       java.lang.String name = "Niraj";
       java.lang.String result = port.exam(roll, name);
       out.println("Result = "+result);
  } catch (Exception ex) {
}
  %>
  <hr/> </body>
</html>
```

OUTPUT

stud Web Service Tester

This form will allow you to test your web service implementation (WSDL File)

To invoke an operation, fill the method parameter(s) input boxes and click on the button labeled with the method name.

Methods :

public abstract java.lang.String student.Stud.exam(int,java.lang.String)

exam			_
	(,)

exam Method invocation

Method parameter(s)

Туре	Value
int	1
java.lang.String	laksh

Method returned

java.lang.String : "record inserted"

SOAP Request

```
<?xml version="1.0" encoding="UTF-8"?><S:Envelope
xmlns:S="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
```

```
<SOAP-ENV:Header/>
<S:Body>
<ns2:exam xmlns:ns2="http://student/">
<roll>1</roll>
<name>laksh</name>
</ns2:exam>
</S:Body>
</S:Envelope>
```

SOAP Response

<?xml version="1.0" encoding="UTF-8"?><S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"> <SOAP-ENV:Header/> <S:Body> <ns2:examResponse xmlns:ns2="http://student/"> <return>record inserted</return> </ns2:examResponse> </S:Body> </S:Envelope>

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CONCLUSIONS

Thus, a new open grid service architecture- complaint web service in java using NetBeans IDE 8.2 was built and deployed successfully.
3. Develop a Grid Service Using Apache

AIM

To develop a grid service using Apache axis in net beans 8.2

PROCEDURE

Search axis2 download in google

Download both binary distribution and war distribution

Unzip both the downloads

In the binary distribution go to lib folder

Copy all the jar files alone

Then go to the following location(This is as per my pc, check for your pc)

C:\Users\14cse35\AppData\Roaming\NetBeans\8.2\modules\ext\axis2

Delete all the files present there.

Paste the jar files that you copied from lib folder

Go to Tools -> Libraries and select Axis-1.3 (version may differ for you)

Under library class path select all and click remove

Now click Add JAR/Folder

Browse to the location

C:\Users\14cse35\AppData\Roaming\NetBeans\8.2\modules\ext\axis2 (location may differ)

Select all the files and click Add JAR/Folder

Also check for library name version and update it and click OK.

Start the glass fish server in net beans IDE from services -- > server

Go to browser and type

Localhost:8080

If the following comes you are on the right path

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🕂 🔿 Search the web and Windows 🔒 🗇 👼 🏟 🔳 🖉 🃦 🧕 🥥

Go to browser and type localhost:4848

Click Applications from the left pane

Click Deploy and then select the file axis2.war from the war distribution

After the file gets loaded click OK

A file axis2 with hyperlink will be there. Click that

Again go to Applications in the left pane and click Launch which is across Axis2 service

A browser page opens click the first link

Click Services and then click Version

It will take you to a wsdl page.

Edit the url as follows

...../axis2/services/Version/getVersion?

Hit Enter, you will get the version number of deployed service

Installing the Axis2 Support Plugin

 In the IDE, go to the Plugin Manager, under the Tools menu, and check whether Axis2 Support Plugin is installed, under the Installed tab. If it is installed, check whether an update is available in the Updates tab. If the Axis2 support is not installed, install it from -> Go to Tools -> Plugin
 -> Settings tab and then click Add.

Now give the below url

http://deadlock.netbeans.org/hudson/job/nbms-andjavadoc/lastStableBuild/artifact/nbbuild/nbms/updates.xml.gz

Relo	ad Catalog			Search:
	Name visuar web 35F Port OpenPortal Portlet C OpenPortal Portlet C GlassFish V3 JRuby I Ruby and Rails Dist Ruby and Rails Dist Ruby and Rails Dist Ruby and Rails XSLT SOA BPEL Composite Application JMeter Kit Interactive UI Gestu Jindent Ant 1.7.1 Document Load Generator Code Coverage Plugin UMLKit Clearcase Visual Web JSF Back JAX-RPC Web Services Axis2 Support	Categ ▼ PortalPack PortalPack PortalPack Ruby Ruby Ruby Ruby SOA SOA SOA SOA SOA SOA SOA SOA	E	Axis2 Support NetBeans Certified Plugin Version: 1.2 Date: 8/11/08 Source: NetBeans Homepage: http://www.netbeans.org/ Plugin Description Support for Axis2 Web Services Stack

Setting Up Axis2 Options for GlassFish

• Go to this url and click the first link

http://www.apache.org/dyn/closer.lua/axis/axis2/java/core/1.7.5/axis2-1.7.5-war.zip

To set up Axis2 options for Glassfish:

Unpack the downloaded archive file

containing axis2.war to GLASSFISH_HOME/domains/DOMAIN_NAME/autodeploy. To find GLASSFISH_HOME and the name of your domain, start the IDE and open the Services tab. Expand the Servers node. Right-click the GlassFish node and select Properties from the context menu. The Domains folder location and the name of the domain are visible in common tab.

 $C:\label{eq:config} C:\label{eq:config} C:\l$

 $(AppData \rightarrow is a hidden folder \rightarrow to open that \rightarrow after clicking your particular user name-> click organize tab-> Folders and search option->click view tab -> select show hidden files folders-> click ok-> now AppData folder Visible)$

Now click AppData->Roaming->Netbeans->8.2->config->GF-4.1.1->domain1->Autodeploy->paste the axis.war file in the autodeploy folder

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	a_jre_usage
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Start the IDE. From the top menu bar, choose Tools -> Options. The Options dialog opens.

Click the Axis2 icon. The Axis2 deployment options page opens. ->browse link

(C:\Users\14cse35\AppData\Roaming\NetBeans\8.2\config\GF_4.1.1\domain1\autode ploy\axis2.war)-> click ok

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Set the target location for Axis2 AAR files to the axis2.war file you unpacked into the GlassFish autodeploy directory.

By placing axis2.war into autodeploy, you enable GlassFish to automatically redeploy axis2.war every time you alter the file. On GlassFish , however, you cannot redeploy the WAR file while the server is running.

5. Make sure the Axis2 URL field contains the correct port number for your GlassFish server. To check the port number, start GlassFish (from the Services tab or from Tools

-> Servers) and see what 80xx port HTTP 1.1 uses. The default port number is 8080.

In the following image, the correct port number is 8081 (because another server already uses 8080).

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	Java DB Database Process x GlassFish V2 x ADMISOC. Status OI Stanuard ONA COMMETCOIL ACTIVE - [true] JBIFW0010: JBI framework ready to accept requests. WEB0302: Starting Sun-Java-System/Application-Server. WEB0712: Starting Sun-Java-System/Application-Server HTTP/1.1 on 8081 WEB0712: Starting Sun-Java-System/Application-Server HTTP/1.1 on 8182 WEB0712: Starting Sun-Java-System/Application-Server HTTP/1.1 on 8182 WEB0712: Starting Sun-Java-System/Application-Server HTTP/1.1 on 4849 Scanning for root resource classes in the paths: C:\Documents and Settings\jeff\My Documents\NetBeansProjects\sakila\build\we C:\Documents and Settings\ieff\My Documents\NetBeansProjects\sakila\build\we	P/MEE	8-I: 8-I:

Developing an Axis2 Web Service

In this section, you use NetBeans IDE to create, deploy, test, and modify an Axis2 web service.

Creating an Axis2 Web Service

With NetBeans IDE, you can create an Axis2 web service from a Java class. You can only do this from a Java application or Java library project. In this tutorial, you create a Java library project (because you do not need a main method), create an Axis2 web service in that project (creating the Java class at the same time) and deploy the Axis2 web service to a server. You can only create an Axis2 web service from a Java or Java Library project. This is because the **axis.aar** file (the deployable archive into which web services and Axis configuration files are packed) is neither a WAR nor an EAR and cannot be deployed normally as a web (EAR) application.

To create an Axis2 web service:

- Click the New Project icon or File -> New Project. The New Project wizard opens. From the Java category, select a Java class library project. Click Next.
- 2. Name the project AxisHello. Check that you are using the project folder name and location that you want. It is up to you whether to share the project. Click Finish, and the IDE creates the project.

 Right-click the project node. The context menu opens. In the context menu, choose New -> Other. The New File wizard opens. From the Web Services category, choose Axis2 Service from Java and click Next.

Steps	Choose File Type	
1. Choose File Type 2	Project: 🏼 🔊 AxisHello	
	Categories:	File Types:
	Swing GUI Forms JavaBeans Objects WT GUI Forms	Web Service Client Logical Handler Message Handler Message Service from Java
	- 12 JUnit - 12 Persistence - 13 Groovy - 14 Hibernate	Axis2 Service from WSDL
	- XML	•
	Description:	
	Creates an empty skeleton w components that semantically	web service. Web services are reusable software Ily encapsulate discrete functionality.

4. The Service Type Selection page of the New File wizard is now open. You do not have any Java classes in the project, so select "Create an Empty Web Service." If you had already coded a Java class, you would have selected Create a Web Service from an Existing Java Class. If you wanted to edit the WSDL of the web service, for example to add or change namespaces, you would select Generate a WSDL from Java Source Code. Editing WSDL is outside the scope of this tutorial, so leave this unselected. The wizard should look like the following image.

Service Type Selection
 Create Empty Web Service Create Web Service from Existing Java Class
Java Class Name: Browse .
Generate WSDL from Java Source Code (useful when you want to customize the default WSDL file generated by a

- 5. Click Next. The Name and Location page opens. Name the Java class HelloAxisWorld. Name the package axishello. Leave Generate Sample Method selected. This generates a method in the Java class that returns "Hello, World."
- 6. Click Finish. The IDE generates a HelloAxisWorld.java class in the axishello source package and a HelloAxisWorld Axis2 web service that mirrors this Java class. You can see that both the Java class and the Axis2 web service have a hello:String

respectively. File Edit View Navigate Source Refactor Build Run Profile Versioning Tools Window Help 10 3 👚 🚰 🚭 😹 🗣 💼 ୭ 🥐 🏋 🍞 🕨 🕼 - 🕦 - 💷 🕬 Projects 40 × Services HelloAxisWorld.java × Se Axish ■■-■-Q₽₽₽₽₽₽₽₽₽₽₽₽ Source Packages axishello HelloAxisWorld.java package axishello; Axis2 Web Services HelloAxisWorld E /** hello: Str Ca Libraria * @author jeff E Ca Test Libraries public class HelloAxisWorld (hello - Navigator 40 × P /** Sample method 🖃 🏠 HelloAxisWorld hello(String name) : String P public String hello(String name) (return Hello +name; > <
1:1 INS 🐅 🔲 🐷 🍈 🖕 📲

operation, shown in the Navigator tab and as a node of the Axis2 web service,

Deploying and Testing an Axis2 Web Service

To deploy an Axis2 web service to the server:

- Right-click the web service's node. The context menu opens. Select Deploy to Server. The IDE compiles an Axis2 AAR file and copies it to the axis2.war file used by the application server.
- 2. If you have enabled automatic deployment, the web service is deployed to the server. If the server is not running, start it and the web service is automatically deployed.
- 3. To test the service, expand the web service node to reveal the operations. Rightclick the hello:String node and select Test Operation in Browser.



IF THE TEST OPERATION IS NOT DEPLOYED IN SERVER LIKE GIVEN BELOW!!!!

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Axistelo Axistelo Service Axistelo Service Axistelo Ax	NetBeans IDE Learn & Discover My N	letBeans What's New	Show On Startup 🔽
Green de la constante de	My NetBeans		
HelloWorld - Navigator ×	Information Neither deployment directory nor war file specified for Axis2 web application (Axis2 e Please, specify the axis2.war or axis2 deployment directory location in Tools -> Options -> Axis2 -> Deployment panel.	environment).	Activate Features NetBeans turns on functionality as you use It. Start creating and opening projects and the IDE will just activate the features you read, making your experience autiker and features manually.
	ORACLE		َ العام (Java
<no available="" view=""></no>	Output ×		

THEN, WE DEPLOY IT MANUALLY,

First Build the java project.then,



Go to Web-browser->localhost:8080/axis2/

C Login to Axis2 :: Admini: x	4		-	٥	\times
\leftrightarrow \Rightarrow C O localhost8080/axis2/axis2-admin/welcome	7	☆	C	@	
http://www.apache.org/					
Back Home Refrash					
Welcome :					
Welcome to the Axis2 administration console. From inside the Axis2 administration console you can : Username. admin					
Check on the health of your Axis2 deployment.	-				
Change any parameters at run time.	n				
Upload new services into Axis2 [Service hot-deployment].					
Warning: Please note that configuration changes done through the administration console will be lost when the server is restarted.					

Copyright © 1999-2006, The Apache Software Foundation Licensed under the <u>Apache License, Version 2.0</u>.

Type user name:admin and Password:axis2



->Administration->Available Services->it'll show java_class->and give the values as what mentioned in the java directory.

Finally, it run on the browser given above.

*If it not run further go to Netbeans project->extract your java class->In services.xml - >change the input and output messageReceiver namespace like given below.

Services.xml

<?xml version="1.0" encoding="UTF-8"?>
<serviceGroup><service scope="application"
name="HelloWorld"><description>HelloWorld
service</description><messageReceivers><messageReceiver
class="org.apache.axis2.rpc.receivers.RPCInOnlyMessageReceiver"
mep="http://www.w3.org/ns/wsdl/in-only"/><messageReceiver
class="org.apache.axis2.rpc.receivers.RPCMessageReceiver"
mep="http://www.w3.org/ns/wsdl/in-out"/></messageReceiver"
mep="http://www.w3.org/ns/wsdl/in-out"/></messageReceiver"</pre>

4. Your browser opens with a test value of your variables. The test value is appended to the URL.

http://localhost:8084/axis2/services/HelloAxisWorld/hello?name=XYZ	2 - Windows Internet Explorer	
- R http://localhost:8084/axis2/services/HelloAxisWorld/h	nello?mame=XVZ + + × Live Search	• م
😭 🚸 🔣 http://localhost:8084/axis2/services/HelloAxisWo	🗋 • 📾 • 👘 • 🔂 i	Page 🔻 🔘 Tools 🔻 "
- <ns:helloresponse xmlns:ns="http://axishello"> <ns:return>Hello XYZ</ns:return> </ns:helloresponse>		
		-

5. Change the variable value in the URL and press Enter. The test result changes as well.

6 http://localhost:8084/axis2/services/HelloAxisWorld/hello?na	me=Stephen%20Fry - Windows Inter	net Explorer	•
😋 🔵 👻 🕅 http://localhost:8084/axis2/services/HelloAxis	sWorld/hello?name= <mark>Stephen%20Fry</mark>	- 4 X Live Search	. م
🍲 🛷 🔀 http://localhost:8084/axis2/services/HelloAxisW	/o	🖞 • 🖾 • 🖶 • 🕻	🔐 Page 🔹 🌍 Tools 💌
- <ns:helloresponse <br="" xmlns:ns="http://axishello"><ns:return>Hello Stephen Fry</ns:return> </ns:helloresponse>	>		
Done	🗣 Local	intranet Protected Mode: On	💐 100% 👻

Changing the Web Service's Operations

To change the web service operations, edit the Java file in the project. The operations in the web service change simultaneously. Add a simple add method to HelloAxisWorld.java, as below.

```
public class HelloAxisWorld {
```

```
/** Sample method
```

```
*/
public String hello(String name) {
    return "Hello "+name;
}
public int add(int x, int y) {
    return x+y;
}
```

Save the Java file, and the operation appears as a subnode of the web service.

Redeploy the web service and test it as described in <u>Deploying and Testing an Axis2 Web</u> <u>Service</u>.

I Services Projects AxisHello axishello 🖶 🔂 Test Packages Axis2 Web Services 0- @ Libraries +---Test Libraries HelloAxisWorld - Navigator 40 88 Members View 🖃 🏠 HelloA×isWorld add(int x, int y) : int
 hello(String name) : String 🏪 🔲 🐻 🛅 💆 📲

Refer: http://aragorn.pb.bialystok.pl/~dmalyszko/PaWWW/ps34-axix2.htm

CONCLUSIONS

Thus, the grid service using Apache axis in net beans 8.2 is developed and the outputs are verified.

4. DEVELOP APPLICATIONS USING JAVA OR C/C++ GRID APIS

AIM

To develop an applications using Java or C/C++ Grid APIs in Net beans 8.2

PROCEDURE

To create RESTful web services, you need a Java Web application project.

To create the project:

- Choose File > New Project (Ctrl-Shift-N. Under Categories, select Java Web. Under Projects, select Web Application. Click Next.->Gridlab(project name)->next-> The New Web Application wizard opens.
- 2. Select either Java EE 6 Web or Java EE 7 Web. Under Server, select the server you want to use, but note that Java EE projects require GlassFishserver. Click through the remaining options and click Finish.

Creating Database

Select services->Database->javaDB->right click->create Database->database name :gridlab->usernsme:gridlab ->password->gridlab ->retype pwd: gridlab->click ok

Select & Right click->jdbc:derby://localhost:1527/ gridlab->connect

Goto project->select your project name(gridlab)->rightclick->new->entity class->class name:seller->next->gotoDatasource->select new datasource->select database connection and click ok->then click finish

teps	Provider and Datab	base
Choose File Type Name and Location Provider and Database	Persistence Unit Name Specify the persistence	: kavi4PU e provider and database for entity classes.
	Persistence Provider:	EdipseLink (JPA 2.1)(default)
	Data Source:	New Data Source
	NDI Name: kavi4-	de
	atabase Connection: jdbc:d No connection sele	Jerby://localhost:1527/gcc4 [kavi on KAVI] Jerby://localhost:1527/sample [app on APP]

Seller.java code page will open-> right click in the code page->select insert code-> select add property->edit name as->lastname->ok

Again in-> Seller.java code page will open-> right click in the code page->select insert code-> select add property->edit name as->firstname->ok

Again in-> Seller.java code page will open-> right click in the code page->select insert code-> select add property->edit name as->email->ok

Next go to project-> right click->new->select RESTful webservices from Entity classes...

A window open->select from the available entity classes->Seller(com.bonbhel.oracle.kavi4)->click Add->next->edit resource package name->select from dropdown->gridlab and edit as (gridlab.service)->finish->check for option netbeans is selected->click ok

Netheans will generate a	a subclass of isway we re core Application
all REST resources will be	e registered by this class automatically(JavaEE 6).
User is responsible for R e.g. by implementing a s	EST resources registration, pecific subclass of javax.ws.rs.core.Application,
ar bu requirering a seen	
Or by registering a speci	EST service adaptor in web vml
© Create default Jersey R	EST servlet adaptor in web.xml.
or by registering a speci	EST servlet adaptor in web.xml.
or by registering a speci	EST servlet adaptor in web.xml.
or by registering a speci Create default Jersey R Add Jersey library (JAX	EST servlet adaptor in web.xml. EST servlet adaptor in web.xml. -RS reference implementation) to project dasspath.

Got your project-> expand gridlab.service->click AbstractFacade.java->code will display

Next click->SellerFacadeREST.java->code will display->in the code section-> edit the following @path("gridlab.seller")-> as ->@path("/seller/")->

Rightclick project->run->browser page will open and display as Hello world-> in the address bar->edit the address as-><u>http://localhost:8080/kavi4/resources/seller/</u> ->reload the page-> output display as -><sellers>



Now go to project->rightclick->new-> JSF pages from entity classes. -> a window open-> select from available entity classes-> com.bonbhel.oracle.kavi4.seller-> click add-> next-> edit session bean package as-> com.bonbhel.oracle.kavi4.facade-> then edit JSF classes package as-> com.bonbhel.oracle.kavi4.presentation-→ then JSF pages Folder as->ui-> next->check for Libraries as->JSF 2.2(version may vary)->finish

OUTPUT

Goto project->right click-> run



Click show all seller items->click create new seller-> type in the fields and click save

\leftrightarrow \Rightarrow (C ilocalhost:8080/gridlab/faces/laksh/seller/List.xhtml
Creat	e New Seller
ld:	1
Email:	laksh@gmail.com
Firstname:	Laksh
Lastname:	Parasmalji
<u>Save</u>	
Show All S	eller Items
Index	

-> Then click show All Seller Items

←	→ C iloca	lhost:8080/gri	dlab/faces/lak	sh/seller/Create.xh	ntm 🕁
Li:	st				
Id	Email	Firstname	Lastname		
1	laksh@gmail.com	Laksh	Parasmalji	View Edit Destroy	
<u>Crea</u>	<u>te New Seller</u> <u>×</u>				

CONCLUSIONS

Thus the implementation of applications using java or c/c++ grid apis has been verified successfully.

5. DEVELOP SECURE WEB SERVICES APPLICATIONS

AIM

Develop a web service program for Square area calculation. Make this web service secured using security mechanism of "Username Authentication with Symmetric Keys"

PROCEDURE

- Adding User to Glassfish in Administration
- Make a web project
- Develop web service
- Secure Web Service Application
- Deploy the project
- Make a Client Web project
- Make a Web Service Client
- Edit properties of Web Service
- Deploy and Run the Client

Adding user to GlassFish

To add users to Glassfish using the Admin Console, follow these steps:

- Start the NetBeans
- Start the Glassfish Server as shown below in Fig.1
- Open the Admin Console in the internet browser with the url http://localhost:4848
- Give the User Name admin, password adminadmin

🚽 · 🕑 😏 🏠 🙀 🚛 http://kocalhost.14948/kogin.sd		A the thod invocation t	Di.com Mad: World's	P C · U	
SA	un Java ~ Syste dmin Console User Name: admin Password: Logi	em Application	ı Server		
Copyright (2) (007 Sam Microsystems, Inc. All rights States Sun Accorpitems, Inc. has intellectual prope document. In particular, and without limitation, these Covernment Rights - Commonstal software covernment Rights - Commonstal software covernment Rights - Control Rights - Covern and applicable provisions of the FAR and its supplem developed by Mind parities Portions may be derived in Sun logo, Java, Jini, Netra, Solans, Sun Ray and Suu Microsystems, Inc. in the US and other countries	eserved. Unpublished ricellectual progesty right nal patents or pending in nent users are subject ients. Use is subject to form Berkeley BSD syste Java System Applicab	rights reserved under inclogy embodied in th its may include one or patent applications in it to the Sun Microsyster icense terms. This dist ems, licensed from U on Server are tradema	The Copyright Laws of 1 e product that is descri- more of the U.S. patent he U.S. and in other cou- ns, hic standard licens tribution may include ma of CA. Sun, Sun Micros rrks or registered trader	the United libed in this is listed at untries U.S. a agreement atenals systems, the marks of Sun	

Figure. 1

• After successful login Admin Console gets opened as shown below in Figure. 2



Figure. 2

Expand the Configuration node in the Admin Console tree.

- Expand the Security node in the Admin Console tree.
- Expand the Realms node. Select the file realm as shown below in Fig. 3



Figure. 3

- Click on New Button for New File Users
- It opens the New File Realm User Form as shown below in Figure 4.

Home Version User: admin Domain: domain1 S Sun Java [™] System App	Server: localhost lication Server Admin Console
 Web Container EJB Container Java Message Service Security Realms 	 Configuration > Security > Realms > admin-rea File Users Manage user accounts for the currently selected se
admin-realm file certificate JACC Providers Message Security Transaction Service HTTP Service CRB Thread Pools	User ID admin

Figure .4

- In the New File Realm User Form give the following values
 - User ID = wsitUser
 - Group List = wsit
 - New Password = changeit
 - Confirm New Password = changeit

as shown below in Figure. 5

Ele Edit Yew Higtory Bookmarks I	jools Help Sorigt		- # ×
O O · O O A II 🗋	http://flocalhost:4848J	🙆 🎲 🛷 🔹 🚺 🖬 isidprodental	P 😅 - 🖬
DN.com Mail: Workfis	ve System 😝 📄 (Unitied)	🔄 📑 Method invocation tr 🚙 📄 http://loca/index.dep 📖	Invalid Method Type - + -
Home Version User: admin Domain: domain1 Sun Java" System Ap	Server: locationst plication Server Admi	n Console	Cogout Help
Service Assemblies Components	Configuration > Security > F	tealms > file	
Shared Libraries Custom MBeans Resources	New File Realm Use Create new user accounts for t	If the currently selected security realm.	OK Cancel
Configuration Web Container	User ID *	weitUser Name of a user to be granted access to this realm, nan characters, must contain only alphanumenc, underscor	e can be up to 255 e, dash, or det characters
 B Container Java Message Service 	Group List	wsit Separate multiple groups with commas	3
* 💼 Realms	New Password * Confirm New Password *		
Constant Provide Audit Modules Message Security Transaction Service Message CRB			

Figure. 5

- Click OK to add this user to the list of users in the realm.
- After user creation, it gets displayed in File Users as shown below in Figure 6.



Figure. 6

Web Service Project Creation>

- Create a Web Application Project
- Type the name as WebServiceSecurity.
- Click on Next Button as shown in Figure. 7.

Steps	Name and Loca	tion	
Choose Project	Project Name:	WebServiceSecurity	
 Name and Location Server and Settings 	Project ("ocation:	C:\Documents and Settings\poseindia\My Documents\NetBeansProjects	Browse
Frameworks	Project Eolder:	ments and Settings/roseindia/My Documents/NatBeansProjects/WebServiceSecurity $\space{-1mu}$	
	Use Dedicate	d Folder for Storing Libraries	
	Cibrarles Folder:		Beowse
	Set as Main P	roject	
	Set as Main P	roject	
	Set as Main P	roject	
	☐ Set as Main P	roject	
	☐ 5et as Main P	roject	



- Now select the Server
- Select the Glassfish as shown below in Figure 8.
- Click on Finish Button.

Chew web	мррисацон	Common and Cal	No. og	4
1. Choose F	Yoject	Add to Enterprise	• Application: Clivine >	18
2. Name an 3. Server 4. Framewo	d Location and Settings rks	Şerver:	CERSENTY2(1)	Add
		java EE Version:	Java EE S 💌	
		Context Path:	/WebServiceSecurity	

Figure. 8

Web Service File Creation >

- The above steps creates a Web Application Project
- Create a Web Service File
- Right Click on the Web Service Security
- Select NewàWeb Service as shown below in Figure. 9.



Figure 9

- Type the web service class name as square
- Type the package name as pack1
- Click on Finish as shown below in Figure 10.

New Web Service	
steps	Name and Location
Choose File Type Name and Location	Web Service Name: square
	Broject: WebServiceSecurity
	Location: Source Packages
	Padgage: [pack1
	Create Web Service from Existing Session Bean Enterprise Bean: Btowse Btowse
	< Back Next > Enish Cancel Help

Figure.10

- It creates a Web Service in design view
- Click on Add Operation Button as shown below in Figure 11

Proj., 41 × Files 54	rvices	Findex.sp =	
EXEMPLANT EXEMPLANT	~	Source Design 🔀 편 🕸 100% 💌 🔍 🔍 💭 squareService	
 € Sub-Clerk Suc-RPC ★ Registry1 € WebAppExten1 € WebAppExten2 € WebAppExten2 € WebAppExten2 € WebAppExten2 € WebAppExten3 		Operations	Add Operation
	-	Quality Of Service	B
WED Forder WED Forder WED Forder Web Services Configuration Hies		Optimize transfer Of Binary Data (MTON) Reliable Message Delivery Secure Service	
Gerver Resources Gorver Resources Gorver Packages Gorver Packages Gorver Deckages Gorver Libraries			Advanced
square.java - Navigator	6 ×		
Neb Service Design	×		

Figure. 11

- Give the operation name as area with return type String
- Click on add to add parameter
- Type the name of parameter as side and type as int.
- Do above steps as shown below in Figure 12.
- It generates the code of operation area.

leturn <u>T</u> ype:	java.lang.Strin	g		Browse
Parameters	Exceptions			
Name		Туре	Final	Add
side		int		Remove
				Down
				Do <u>w</u> n

Figure 12

In generated code edit some value as shown below

package pack1;

import javax.jws.WebMethod; import javax.jws.WebParam; import javax.jws.WebService;

```
/**
 *
 * @author roseindia
 */
@WebService()
public class square {
  @WebMethod(operationName = "area")
  public String area(@WebParam(name = "side")
  int side) {
```

```
return "area of square of side"+side+" is "+(side*side);
}
```

Enabling Security in Web Service>

- Open the square.java Web Service program in design view
- Select the Check box Service Secure as shown below in Fig 13.

}

a las	10	1/19			1000
Proj. 4 × Hies	Services	Protection + Protections +			(11.6)
		squareService			
		Operations (Add Operation) (Remote Carrot			em) (Henrice Constitution) 🖂
		@ ana			
i- 🌐 webservice1 - 🎒 WebServiceSecurity		Parameters	Output	Faults	Description
🖶 🙆 Web Pages		Parameter Name		Param	eter Type
index.jsp		Dive III			
Gai Web Services Configuration files Gai Server Resources		Quality Of Service			
Gin Source Packages Gin Test Packages Gin Libraries		⊂ Optimize Transfer Of Binary Data (MTOM) ⊂ Roliable Message Delivery			
square.java - Navigator	6 ×	# Secure Service			
Tembers View	*				Advanced
erea(int side) : titring		<u></u>			
the second s					

Figure. 13

- Click on Advanced Button
- It opens the dialog box for security
- Select the Secure Service check box as shown below in Figure 14.

square	×
Configure security, reliability and other WS-* features in the 'Quality Of Service' tab. Press F1 on a header for details specific to its section.	
Quality Of Service	
🛛 squarePortBinding	^
Optimize Transfer Of Binary Data (MTOM)	
Reliable Message Delivery	
Deliver Messages In Exact Order	
Advanced	
Secure Service	
Security Mechanism: Username Authentication with Symmetric Key	1
Username authentication with symmetric keys for integrity and confidentiality protection.	
Use Development Defaults	
Keystore Iruststore Validators Advanced	
Act As Secure Token Service (STS) Configure	_
Allow ICP Transport	
Disable East Infoset	
area Operation	~
OK Cancel Help	

Figure. 14

- After selecting the secure service, it gets applied for Input Message and Output Message parts
- Scroll down, Input Message and Output Message comes as shown below in Figure 15

I square Configure security, reliability and other WS-* features in the 'Quality Of Service' tab. Press F1 on a hear pecific to its section.	er for details
uality Of Service	
Keystore Iruststore Yalidators Advanced Act As Secure Token Service (STS) Configure	
Allow TCP Transport	
🗐 area Operation 🗉 area 🗟 Input Message	
Authentication Ioken:	X
Endorsing Message Parts	
Output Message Output Message Message Parts	
Саг	icel Help

Figure 15

- Click on Message Parts button inside Input Message
- It opens dialog box where all values of Sign is selected
- In Encrypt one value for Body Message part is selected as shown below in Figure 16
- Click on Message Parts button inside Output Message
- It opens dialog box where all values of Sign is selected
- In Encrypt one value for Body Message part is selected as shown below in Figure 17

Message Part	Sign	Encrypt	Require		Add Body
Body	¥			~	C
To (Addressing)	×		1		Add Header
From (Addressi	~				Add YPath
FaultTo (Addre	×		100		Add AFadi
ReplyTo (Addre	1		- 55		Remove
MessageID (Ad	1		- 55		
RelatesTo (Add	1		- 55°		
Action (Addres	1		1	~	



Message Part	Sign	Encrypt	Require		Add Body
Body	¥	Image: A start and a start		~	
To (Addressing)	V				Add Header
From (Addressi	\checkmark				Add VDath
FaultTo (Addre	\checkmark				Aug APath
ReplyTo (Addre	\checkmark		1		Remove
MessageID (Ad	V				
RelatesTo (Add	\checkmark				
Action (Addres	×	- E	1.3	~	



Testing Web Service

- Right Click on the Web Service square
- Select Test Web Service as shown below in Figure 18.



Figure.18

• It gives message that secured Web Service doesn't have support of tester feature as shown below in Figure 19.



squareServiceis a secured web service; Tester feature is not supported for secured services

Figure. 19

Web Service Client

• For above created Web Service a Client is created

- Take a new Web Application Project
- Give it a name WebServiceSecurity-Client
- Click on Next button as shown below in Figure 20.

iteps	Name and Loca	stion	
Choose Project	Project Name:	WebServiceSecurity-Client	
A Name and Location Server and Settings	Project Location:	C:\Documents and Settings\roseindia\My Documents\NetBeansProjects	Browse
 Frameworks 	Project Eolder:	and Settings/poseindia/My Documents/NetBeansProjects/WebServiceSecurity-Client	
	Use Dedicate	d Folder for Storing Libraries	
			Renaution
	🛄 Set as Main F	Different users and projects can share the same consideron its aries (see roject	Herp for deta
	Set as Main F	Different laters and protects can share the same compliation libraries (see roject	Hepfardeta
	Set as Main P	Different laters and protects can share the same compliation libraries (see roject	Herp for deta

Figure. 20

- Select the Glassfish server
- Click on Next Button as shown below in Figure 21

New Web Application		
Steps	Server and Settings	
1. Choose Project	Add to Enterprise Application:	dimes 🖉
Name and Location Server and Settings	Server: FlatsFoh Va	1) 🖌 🖌 Add
 Frameworks 	Lise døde	ked library folder for server 3439 (Res
	Java EE Version: Java EE 5	
	Context Path: /WebService	jecurity-Client
		<back next=""> Enish Cancel Help</back>

Figure. 21

- A Web Service Client project is created
- Develop a java class for Web Service Client
- Right Click on the WebServiceSecurity-Client select NewàWeb Service Client

As shown below in Figure 22.

WebServiceSecurity	-Client - NetBeans IDE 6.1			
File Edit View Navigate	Source Reflector Build Run Pr	offe Versioning Tools Window Help 🗃 👂 🖽 - 💮 -		
Proju. 4 Files Propiny1 Propiny1 Propiny1	Services in role of the services in the servic	All a local state of the second state of the s	NO . NO .	4 + • • •
ia ⊕ Track Libraries → Windownodetur → Web Pape →	Crean Verify Generate Javadoc Run Undeplay and Deplay Debug Profile Text BESTING Meth Services Set as Multi Project Coorn Replayed Projects Close	Born Server	itie>	
	Rename Move Copy Delete Delete	🕐 other		
🐻 Output 🛛 EHITTP Mic	Find CbrieF Versioning Local History	[06]		
🐉 start 🔰 🗇 🕫	Properties	Se 🍯 untitis 🐚 V. W	- 🖬 Me 😕 000 🗈 Mete 🛛 🕫 🤇	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Figure. 22

- It opens a dialog box for WSDL and Client location
- Click on the browse button as shown in Figure 23.

Steps	WSDL and Clie	ent Location	
 Choose File Type WSDL and Client Location 	Specify the WSL Project: Local File: WSDL URL: Specify a locatio	DL file of the Web Service,	Browsg Browse Set Proxy
	Project:	WebServiceSecurity-Client	
	P <u>a</u> ckage:	<default package=""></default>	
	Client Style:	JAX-WS Style	
	Generate D	ispatch code RL of the service you wish to use.	

Figure. 23

- In the pop up dialog box select the Web Service
- Select WebServiceSecurity àsquare
- Click on OK as shown below in Figure 24.

Browse Web Services	×
Web Services:	
🕀 🌐 Jax-RPC	
🛓 🚫 EJBModule1	
🗊 🍈 webservice1	
🕀 🔊 EJBWebService	
⊕ ⊕ jax2	
🖶 🌐 WebApplication3	
🛓 🌐 🛞 WebServiceSecurity	
square	
	OK Cancel

Figure 24

- This creates a Web Service References Directory
- In side that it creates squareService, squarePort and area method

As shown below in Figure 25.



Figure. 25

Calling Web Service Client Resources

- Right Click in default created index.jsp
- Select Web Service Client ResourcesàCall Web Service Operation as shown below in Figure 26.

• It creates the required code in the index.jsp

WebServiceSecurity-Client - NetBeans IDE	5.1	
file Edit View Navigate Source Refactor Build	Run Profile Versioning Tools Window Help	
Proj. 4 × Files Services	(i) square (i)	(+) (•)
WebConduction: WebCondu	Contract index Contract Cont	
wst-clent.cml Gamma Constraint wat-clent.cml wat-	15 Frank A+3dt+P 16 Frank Starter 17 - <td></td>	
n Carl Lorans M ndex.jsp - Nevigator C x C x C tout body	19 Control Con	
	Code Folds	
	14:5 0.6	

Figure. 26

• Edit the index.jsp and give the value int side=10;

<html>

<body>

```
<%-- start web service invocation --%><hr/>
 <%
try {
pack1.SquareService service = new pack1.SquareService();
pack1.Square port = service.getSquarePort();
 // TODO initialize WS operation arguments here
int side = 10;
// TODO process result here
java.lang.String result = port.area(side);
out.println("Result = "+result);
 } catch (Exception ex) {
// TODO handle custom exceptions here
 }
 %>
 <%-- end web service invocation --%><hr/>
</body>
</html>
```

Edit Web Service Attributes

- As the web service is secure its client should be edited
- Right Click on squareService in Web Service References

• Select Edit Web Service Attributes as shown below in Figure 27.

NotHeans IDE 6.1				
File Edit View Navigate S	iource Refactor Build Rus	Profile	Versioning Tools Window Help	
2 2 2 S 3	· 4 自りで	77	9 ▶ ₺ • 0 •	
Proj., 4 × Files	Services	ndex.tq	i a 🔝 square prva a 😰 index pp a	4 4 4 10
	-Cliest 1 Prose 1 Definition Clieft 1 Edit Visio Service Articlusts Configure Handles		<pre>Ministry and a service (); packi.SquareService service = new packi.SquareService(); quece service = new packi.SquareService();</pre>	
index.jsp - Navigator	Desete	Delete) catch (Exception ex) (
ii 🕜 body	Properties 22 22 23 39	0.1	} \$> <h end="" invocation%="" service="" web=""><hr/> schodys btml></h>	
Cutput CHTTP Manitor	1			
Rentant	Binder State	D	Sec. Sec. Sec. Sec. Sec. Sec. Sec. Sec.	

Figure. 27

- In the opened dialog box select the Quality Of Service
- Check the Use development defaults in security
- Click on OK as shown in Figure 28.

ancy or service	WSDL Customization	wsimport Options		
Security				
Use develo	ppment defaults	0		
Authentica	tion Credentials: Static	~		
Default (Default E	Isemame:			
SAML Callb	ack Handler:		Browse	
Advanced	Configuration			

Figure. 28

Running Client Web service >

- Deploy the WebServiceSecurity-Client project
- Right Click in the index.jsp
- Select run index.jsp as shown below in Figure 29.

WebServiceSecurity-Client - NetBeans ID	6.1					
File Edit Verv Navigate Source Refactor Bull	i Run	Profile Versioning Tools Window Help			-	
		BY P ED. OP.			000000	
Image: Control of the contro	10 10 7 8 9					
WebServiceSecurity-Client WebServiceSecurity-Client WebServiceSecurity-Client WebServiceSecurity-Client WebService WebServiceSecurity WebServiceSecurity WebServiceSecurity WebServiceSecurity WebServiceSecurity WebServiceSecurity WebServiceSecurity	110 12 13 14 15 16 17 18	<pre>dody></pre>	r/> ckl.SquareService ePoct(): unence here	0.2		
Configuration Piles Server Resources	19 20	int side = 10; // TOPO process regula here	Format	Alt+ShirteP	-	
Gillion Source Packages Gillion Control Contro Control Control Control Control Contro	21 22	<pre>java.lang.String result = port.area out.printls("Peoult = "*result);</pre>	New Watch			
Index.jspNevigetor () = = (3) Itel = (3) body	23 24 25 26) catch (Exception ex) (// Toto bandle custom exceptions be 1 55 char and with carries inspection ==b/27	Toggle Line Breakpoint L.u. F.cov Paste	Col+F6 Col+C Col+C Col+C		
	28	-	Properties			
	29 30	- «/html>	Code Folds Select in	;		
			Web Service Client Resour	ces 🔸		
	19:2	3 [1)(5]				
Collegat ETHTTP Marikar						

Figure. 29

- It deploys the project on the server and run it in the browser
- It executes and give the output as shown below in Fig 30.

OUTPUT

< your	Q (1) If you d	🗾 how to bui	👩 KPIT SPAR	Microsoft	🔽 Inside Micr	G hololens in	C What	at's Insi 👘 k	Kavitha Samay	File Users	Security in	JSP P	age	×	3	+ +
(*)() localhost:8080/\	WebServiceSecurity	-Client/index.jsp					▼ C	Q Search	File Users	2	1 🖻		÷	Â	ABP -
Hal	lo Wor	La t														

Hello World!

 $Result = area ext{ of square of side 10 is 100}$

CONCLUSIONS

Thus a secure web service has been created and verified successfully.

6. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.

AIM:

TO DEVELOP A VIRTUAL MACHINE USING CLOUD SIM.

ALGORITHM:

Step1:Copy the cloudsim folder in E:drive

Step2:Open the netbeans, Newproject->Java->JavaApplication->project name->mycloud->finish



Step 3:right click on mycloud->properties->libraries->add jar folder->browse (mycomputer->E drive-> unzipped cloudsim folder->jar->cloudsim3.0.3.jar file-> click ok)

mycloud1 - NetBeans IDE 8.2	A R. D. T. A.A. L. Y. Lawrence and	AN	
File Edit View Navigate Source F Project Properties	- mycloud1	23 Q- Search (Ctrl+I)	
Categories Categories Projects Time Sorves → mycloadi → Sorves → mycloadi → Darces → mycloadi → Darces → mycloadi → > → Burriste → > → DKr.L8 (Defsult) → > → Apolation → > → Outrors Hes → →	Java Platform: (2005 LB (Default) Ubrane Folder: g Comple Transe Folder: comple Transe Lbraries: rtranse Lbraries:	Manage Pistforms Droves Add Project Add JR/Fedder Add JR/Fedder To a D	
Iterigator ₩ Menters	Add JAR/Folder Look in: Look in: <	Reference as R	E
	Computer		* 8
2 116 WORDS L[#	File name: doudsim-3.0.3.iar	Open	
			1 20 100

Step 4: Go to drive E:\cloudsim-

 $3.0.3 \verb| examples \verb| org \verb| cloudbus \verb| cloudsim \verb| examples \verb| Cloudsim example1.java| \\$

	es ▶ org ▶ cloudbus ▶ cloudsim ▶ examples	•	✓ 4 Search e.	amples	Q			
rganize 🔻 Include	in library 🔻 Share with 👻 New folder					English 👻	Sign in Q	\equiv
Favorites	Name	Date modified	Туре	Size				
E Desktop	network	5/2/2013 7:55 PM	File folder					
bownloads	power	5/2/2013 7:55 PM	File folder					
Recent Places	CloudSimExample1.java	5/2/2013 7:55 PM	JAVA File	8 KB				
	CloudSimExample2.java	5/2/2013 7:55 PM	JAVA File	10 KB				
Libraries	CloudSimExample3 iava	5/2/2013 7:55 PM	IAVA File	9.KR				
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CD Drive (G:) Network								
10 items								
Data from: fileinfo.com								

Step5: Right click on Cloudsimexample1.java and copy the code

Step 6: Open Source page in netbeans, delete the code and paste the code (Step5)



Step 7: change the package name and class name as mycloud.

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File Edit View Navigate Source Refactor Run Debug Profil	e Team Tools Window Help	Q Search (Ctrl+I)
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Step 8: Run, Output Vm is created



CONCLUSIONS

Thus the virtual machine has been created successfully.

7. Find a procedure to attach Virtual Box to a Virtual Machine

AIM:

To attach a virtual box to a virtual machine.

ALGORITHM:

Step1:Goto :https://sourceforge.net/projects/rf-virtualbox-lib-py/

← → C 🔒 Secur	e https://source	eforge.net/projects,	rf-virtualbox-lib-py,	/							☆ :
	ORGE				100			Help	Create	Join	Login
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Add a Review		Dow	nloads: 0 This	Week		Last Updat	te: 2014-03	19			
🔩 Downlo	ad	Get Updates	Share This						Latitude 7390 2-	in-1	
Summary	Files	Reviews	Support	Wiki	Code	Tickets	Discussion	'n	Get 3-year subs at Rs. 1999.	cription of Dell T 00 only with a De	hreat Defense Il Latitude^
This library provides	support for Virt	ualBox.							Screens si Apps sold so	mulated, subject to	change: y may vary.
In this version I have	developed basic	functionality:									

Step2:download and copy the folder in E:drive

Step3:open the IDE \rightarrow new project \rightarrow java \rightarrow Java project with Existing resources

I NetBearly IDE 6.2								
de Edit View Navigate Source Refactor Run Del	profile Team Tools Window He							
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an Patterns	New law Driast with Evicting Sources							
DQTMarkerSegment	The save respect with existing	New Java Project with Existing Sources						
🗄 😭 Qtable	Steps	Name and Locat	ion					
	1. Choose Project	Specify a name and	l location for the new project.					
	A mane and Location Sexisting Sources A. Includes & Excludes	Project Name:	JavaProject					
		Project Folder:	E:\\JavaProject	Browse				
		Build Script Name:	build.xml					
		Use Dedicated	Folder for Storing Libraries					
		Libraries Folder		Browse				
			Different users and projects can share the same con libraries (see Help for details).	pilation				

Step4:Goto Name and Location→Project Name→Next

Step5:Existing Sources→Add Folder→E:\ Robot framework virtualbox lib-1.1

rojects # Files Services	Start Page	*		
vrgeeta W Files Services	New Java Project with East Steps Concept Project Conc		Add Polder Remove Add Folder Remove	Show On Starker 2
		Coard dragoandy out source and text parages from the exist of the origin. CBack Next > Finish (Cancel Help	

Step6:Click Add Folder \rightarrow Mycomputer \rightarrow E drive \rightarrow Robot framework virtualbox lib-1.1 \rightarrow open



Step7:Attached the virtual box in the virtual machine



Step8: Attached the virtual block to the virtual machine in the cloud sim



CONCLUSIONS

Thus virtual box has been attached with virtual machine.

8. Install a C compiler in the virtual machine and execute a sample program.

Aim:

To Install a C compiler in the virtual machine and execute a sample program

Algorithm:

Step1:Copy the cloudsim folder in E:drive

Step2:Open the netbeans, Newproject->C/C++->CApplication->project name->mycloud->finish



Step 3:right click on mycloud->properties->libraries->add jar folder->browse (mycomputer->E drive-> unzipped cloudsim folder->jar->cloudsim3.0.3.jar file-> click ok)

File Edit View Navigate Source F	Project Properties - mycloud1	and Manager and	23 Q- 50	earch (Ctrl+I)
Projects # Files Services wyckoudi wiew myckoudi wiew m	Categories: Sources Build Packaging Packaging Deployment Deployment Categories: Deployment Packaging Deployment Packaging	Java Platform: JDK 1.8 (Default) Ubraries Polder: Comple processor Run Comple Tests Run Tests Comple-time Ubraries:	Manage Platforms Browse Add Project Add Ibrary Add Jbrary	4) 8 4
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	Computer	File name: doudsim-3.0.3.jar	Оре	88 1:1 INS

Step 4: Go to drive E:\cloudsim-

 $3.0.3 \verb| examples org \verb| cloudbus \verb| cloudsim \verb| examples \verb| Cloudsim example1.c| \\$

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Downloads	power	5/2/2013 7:55 PM	File folder			
Recent Places	CloudSimExample1.iava	5/2/2013 7:55 PM	JAVA File	8 KB		
	CloudSimExample2.iava	5/2/2013 7:55 PM	JAVA File	10 KB		
Libraries	CloudSimExample3 iava	5/2/2013 7:55 PM	IAVA File	9 KB		
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Step5: Right click on Cloudsimexample1.c and copy the code

Step 6: Open Source page in netbeans, delete the code and paste the code (Step5)



Step 7: change the package name and class name as mycloud.

Step 8: Run ,Output Vm is created



Conclusions

Thus the c compiler has been implemented successfully.

9. Show a Virtual Machine Migration based on the certain condition from one node to another

Aim:

To perform virtual machine migration based on the certain condition from one node to another.

Algorithm:

Step1: Open NetBeans8.2

Profile Team Tools Window Help		Q- Search
SetBeans IDE	Learn & Discover My NetBeans What	rt's New Show On Startup 🗹
My NetBeans		
Recent Projects	Install Plugins	Activate Features
<no project="" recent=""></no>	Add support for other languages and technologies by installing plugins from the NetBeans Update Center.	NetBeans turns on functionality as you use it. Start creating and opening projects and the IDE will just activate the features you need, making your experience quicker and cleaner. Alternatively, you can activate features manually.
ORACLE		ے Java ا

Step2: Open the url: https://github.com/manoelcampos/cloudsim-plus

Imanoelcampos / cloudsim-plus Image: Star 50	Features • Platform • Busine	ess • Explore • Pricing •		Sign in Sign up
Code Issues (23 Pull requests 0 Projects 0 Insights Join GitHub today GitHub is home to over 28 million developers working together to host and review code, manage projects, and build software together. Sign up A modern, full-featured, highly extensible and easier-to-use Java 8 Framework for Cloud Computing Simulation http://cloudsimplus.org imulation-framework doud-computing cloud-simulation research cloud-infrastructure imulation java java8 test-bed iaas pass	oelcampos / cloudsim-plus		• Watch 14	★ Star 50 ¥ Fork 49
Join GitHub today Dism GitHub is home to over 28 million developers working together to host and review code, manage projects, and build software together. Image: Comparison of the compar	de () Issues (23 () Pull requests (0 🔄 Projects 0 📊 Insights		
A modern, full-featured, highly extensible and easier-to-use Java 8 Framework for Cloud Computing Simulation http://cloudsimplus.org simulation-framework cloud-computing cloud-simulation research cloud-infrastructure simulation java java8 test-bed iaas page	GitHub and	Join GitHub too b is home to over 28 million developer d review code, manage projects, and b Sign up	lay sworking together to host uild software together.	Dismiss
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© 1.213 commits // 3 branches 0 39 releases 11 9 contributors	⑦ 1,213 commits	2 3 branches	⊗ 39 releases	11 9 contributors

Step3: In IDE →Goto Team-> Git-> Clone

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Step4:Remote Repository→Repository URL appears on the screen

le View Debug Profile Team T	Clone Repository		_ 25				
🕾 🚝 🖴	Steps	Remote Repository					
tart Page #	Remote Repository Remote Branches Destination Directory	Specify Git Repository Location: Repository URL: interfy/ file:///path/to/repo.git/ or /path/to/repo.git/	- Browse,				
		Specify Destination Folder:					
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Rece							
ORAC							

Step5:Type the url in the Repository URL <u>https://github.com/manoelcampos/cloudsim-plus</u> and Click---> Next

· View Debug Profile Team T	Clone Repository				23		
- 🔁 🔛	Steps	Remote Repository					
rt Page 38	Remote Repository Remote Branches Destination Directory	Specify Git Repo	sitory Location: https://github.com/manoelcampos/cloudsim-plus		-		
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Step6:Now it is connected to Git Repository →Remote Repository opens on the screen ,click-→Next

e View Debug Profile Team To	Clone Repository		23
Pa 🔛 🔛	Steps	Remote Branches	
tart Page si	Remote Repository Remote Branches Destination Directory	Select Remote Branches ☐ dev* ☐ gh-pages ✔ master*	
ORAC		Select All Select None Clone name can't be empty Cancel Help	

Step7:Destination Directory→Browse →C:\Users\Administrator\Documents\NetBeansprojects→click finish

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		Clone Repository		
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		Checkout Branch: master* C Remoté Name: origin Scan for NetBeans Projects after Clone		
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Step8: Open Project→cloudplus module

111					
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	Recent Projects	O 7 proj Do yo ☑ O	ects were cloned. u want to open a project? pen Sources in Favorites		Activate Features
	<no project="" recent=""></no>	Open Pro	ect.,, Close		NetBeans turns on functionality as you use it. Start creating and opening projects and the IDE will just activate the features you need, making your experience quicker and cleaner. Alternatively, you can activate features manualiv.



Step:9 Right click cloudsim module→clean and build



Step:10 Click cloudsimplus→modules-→cloudsimplus examples→source packages→click cloud migration.java



Step:11 Click migration →Run file →SUCESSFULLY MIGRATED

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CloudSimExar Copy CoudSimExar	Cut Copy Paste Compile File	36× 36⊂ 36∨ F9	<pre>import org.cloudbus.cloudsim.cloudlets.CloudletSimple;</pre>				
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Conclusions

Thus virtual migration has been performed successfully.

10. Find procedure to install storage controller and interact with it.

Aim:

To install storage controller and interact with it.

Algorithm:

Step1:Goto https://sourceforge.net/projects/windirstat/files/

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	0	Learn Java on Fun and interesting wa	CodeGym ay to learn Java. Try it now!		OPEN	× Interne
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Step2: download and Run the Winstart1_1_2

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Summary	Files	Reviews	Support	Mailing Lists	News	Donate 🗹	Co

NinDirStat (Windows Directory Statistics) is a disk usage statistics viewer and cleanup tool for Windows. On start up, WinDirStat reads the whole directory tree once and then presents it in three useful views:

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ne / Britvese / Byr	Choose Inst Choose the	δ Browse For Folder	3	A.
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nDirStat (W ole director	Space requir Space availa	axis2-1.7.8-war chrome latest version 06-04-2018 Make New Folder OK Cancel		atrea

Step4: choose the E:drive and Do the Installation

Step5:Open IDE-→SELECT New Project

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				.ex EX	E_9ABDDCF9 File
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Conclusions

Thus the storage controller has been implemented successfully.

11. Write a word count program to demonstrate the use of Map and Reduce tasks

AIM:

To write a wordcount program to demonstrate the use of map and reduce using hadoop framework.

ALGORITHM:

Step1:copy the cloudsim folder in E:drive

Step2:Open the netbeans, Newproject->Java->JavaApplication->project name->hadoop->finish



Step 3:right click on mycloud->properties->libraries->add jar folder->browse (mycomputer->E drive-> unzipped cloudsim folder->jar->cloudsim3.0.3.jar file-> click ok)

mycloud1 - NetBeans IDE 8.2	Project Properties - mycloud		8	
Projects # Files Services mycloud1 Gamma Source Packages mycloud1 Gamma Source Packages Mycloud1 Myc	Cetegories Sources Sources Cetegories Compling Complian Comp	Java Platform: [JDK 1.8 (Default) Libraries Folder: [Comple <u>Processor</u> <u>Run</u> <u>Comple Tests</u> <u>Run Tests</u> Comple-time Libraries:	Manage Platforms Browse Add Project Add Jar./Folder	(LIN)
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Step 4: Go to drive E:\cloudsim-

 $3.0.3 \verb| examples org \verb| cloudbus \verb| cloudsim \verb| examples mapper.java| \\$

Step 5: Go to drive E:\cloudsim-

 $3.0.3 \verb| examples org \verb| cloudbus \verb| cloudsim \verb| examples reducer. java$

Step 6: Go to drive E:\cloudsim-

 $3.0.3 \verb| examples org \verb| cloudbus \verb| cloudsim \verb| examples \verb| hadoop.java|| \\$

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🚖 Favorites	Name	Date modified	Туре	Size				
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Downloads	power	5/2/2013 7:55 PM	File folder					
Recent Places	CloudSimExample1.java	5/2/2013 7:55 PM	JAVA File	8 KB				
	CloudSimExample2.java	5/2/2013 7:55 PM	JAVA File	10 KB				
Libraries	CloudSimExample3 iava	5/2/2013 7.55 PM	IAVA File	9 KB				
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Step7:run the program

Step 8:get the result

PROGRAM:

MapClass.java

import java.io.IOException;

import java.util.StringTokenizer;

import org.apache.hadoop.io.IntWritable;

import org.apache.hadoop.io.LongWritable;

import org.apache.hadoop.io.Text;

import org.apache.hadoop.mapreduce.Mapper;

public class MapClass extends Mapper<LongWritable, Text, Text, IntWritable>{

```
private final static IntWritable one = new IntWritable(1);
         private Text word = new Text();
         @Override
         protected void map(LongWritable key, Text value,
              Context context)
              throws IOException, InterruptedException {
           String line = value.toString();
           StringTokenizer st = new StringTokenizer(line," ");
           while(st.hasMoreTokens()){
              word.set(st.nextToken());
              context.write(word,one);
            }
         }
ReduceClass.java
       import java.io.IOException;
       import java.util.Iterator;
       import org.apache.hadoop.io.IntWritable;
       import org.apache.hadoop.io.Text;
       import org.apache.hadoop.mapreduce.Reducer;
```

public class ReduceClass extends Reducer{

@Override

protected void reduce(Text key, Iterable values, Context context)

}

```
throws IOException, InterruptedException {
           int sum = 0;
            Iterator valuesIt = values.iterator();
            while(valuesIt.hasNext()){
              sum = sum + valuesIt.next().get();
            }
           context.write(key, new IntWritable(sum));
          }
       3
hadoop.java
import org.apache.hadoop.conf.Configured;
     import org.apache.hadoop.fs.Path;
       import org.apache.hadoop.io.IntWritable;
       import org.apache.hadoop.io.Text;
       import org.apache.hadoop.mapreduce.Job;
       import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
       import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
       import org.apache.hadoop.mapreduce.lib.output.TextOutputFormat;
       import org.apache.hadoop.util.Tool;
       import org.apache.hadoop.util.ToolRunner;
       public class WordCount extends Configured implements Tool{
          public static void main(String[] args) throws Exception{
            int exitCode = ToolRunner.run(new WordCount(), args);
            System.exit(exitCode);
          }
         public int run(String[] args) throws Exception {
            if (args.length != 2) {
```

```
System.err.printf("Usage: %s needs two arguments, input and output
   files\n", getClass().getSimpleName());
          return -1;
        }
     Job job = new Job();
       job.setJarByClass(WordCount.class);
       job.setJobName("WordCounter");
         FileInputFormat.addInputPath(job, new Path(args[0]));
       FileOutputFormat.setOutputPath(job, new Path(args[1]));
        job.setOutputKeyClass(Text.class);
       job.setOutputValueClass(IntWritable.class);
       job.setOutputFormatClass(TextOutputFormat.class);
         job.setMapperClass(MapClass.class);
       job.setReducerClass(ReduceClass.class);
           int returnValue = job.waitForCompletion(true) ? 0:1;
           if(job.isSuccessful()) {
          System.out.println("Job was successful");
        } else if(!job.isSuccessful()) {
          System.out.println("Job was not successful");
        }
return returnValue;
     }
```

}

Output:

Hadoop	1	
The 2		
This	2	
above	1	
all 1		
alphabe	ts.	1
also	1	
article	1	
as 1		
brown	1	
code	1	
contains	5	1
count	1	
dog.	1	
ecosyste	em.	1
english	1	
example	4	
examples	5	1
famous	1	
file	1	
for 2		
fox 1		
geek	1	
hello	1	
is 3		
java	1	
iumps		
Jumps	1	

Conclusions:

Thus the map and reduce has been implemented successfully.

12. MOUNT THE ONE NODE HADOOP CLUSTER USING FUSE

Aim:

To write a program to use the API's of Hadoop to interact with it

Procedure:

Interfaces

Following are the important interfaces:

• Client<-->ResourceManager

By using YarnClient objects.

• ApplicationMaster<-->ResourceManager

By using AMRMClientAsync objects, handling events asynchronously by

AMRMClientAsync.CallbackHandler

• ApplicationMaster<-->NodeManager

Launch containers. Communicate with NodeManagers by using NMClientAsync objects, handling container

events by NMClientAsync.CallbackHandler

Writing a Simple Yarn Application

Writing a simple Client

- The first step that a client needs to do is to initialize and start a YarnClient.
- YarnClientyarnClient = YarnClient.createYarnClient();
- yarnClient.init(conf);
- yarnClient.start();
- Once a client is set up, the client needs to create an application, and get its application id.
- YarnClientApplication app = yarnClient.createApplication();
- GetNewApplicationResponseappResponse = app.getNewApplicationResponse();
- The response from the YarnClientApplication for a new application also contains information about the cluster such as the minimum/maximum resource capabilities of the cluster. This is required so that to ensure that you can correctly set the specifications of the container in which the ApplicationMaster would be launched.
- The main crux of a client is to setup the ApplicationSubmissionContext which defines all the information
- needed by the RM to launch the AM. A client needs to set the following into the context:
- Application info: id, name

- Queue, priority info: Queue to which the application will be submitted, the priority to be assigned for the application.
- User: The user submitting the application
- ContainerLaunchContext: The information defining the container in which the AM will be launched and run.
- The ContainerLaunchContext, as mentioned previously, defines all the required information needed to run
- the application such as the local *Resources (binaries, jars, files etc.), Environment settings (CLASSPATH
- etc.), the Command to be executed and security T*okens (RECT).
- The ApplicationReport received from the RM consists of the following:
- General application information: Application id, queue to which the application was submitted, user who
- submitted the application and the start time for the application.
- ApplicationMaster details: the host on which the AM is running, the rpc port (if any) on which it is
- listening for requests from clients and a token that the client needs to communicate with the AM.
- Application tracking information: If the application supports some form of progress tracking, it can set a
- tracking url which is available via ApplicationReport'sgetTrackingUrl() method that a client can look at to
- monitor progress.
- Application status: The state of the application as seen by the ResourceManager is available viaApplication Report#getYarnApplicationState. If the YarnApplicationState is set to FINISHED, the client should refer to ApplicationReport#getFinalApplicationStatus to check for the actual success/failure of the application task itself. In case of failures, ApplicationReport#getDiagnostics may be useful to shed some more light on the the failure.
- If the ApplicationMaster supports it, a client can directly query the AM itself for progress updates via the host:rpcport information obtained from the application report. It can also use the tracking url obtained From the report if available.
- In certain situations, if the application is taking too long or due to other factors, the client may wish to killthe application. YarnClient supports the killApplication call that allows a client to send a kill signal to theAM via the ResourceManager. An ApplicationMaster if so designed may also support an abort call via its rpc layer that a client may be able to leverage.
- yarnClient.killApplication(appId);

Writing an ApplicationMaster (AM)

- The AM is the actual owner of the job. It will be launched by the RM and via the client will be provided all the necessary information and resources about the job that it has been tasked with to oversee and complete.
- As the AM is launched within a container that may (likely will) be sharing a physical host with other containers, given the multi-tenancy nature, amongst other issues, it cannot make any assumptions of things like pre-configured ports that it can listen on.
- When the AM starts up, several parameters are made available to it via the environment. These include the ContainerId for the AM container, the application submission time and details about the NM (NodeManager) host running the ApplicationMaster. Ref ApplicationConstants for parameter names.
- All interactions with the RM require an ApplicationAttemptId (there can be multiple attempts per application in case of failures). The ApplicationAttemptIdcan be obtained from the AM's container id.
- There are helper APIs to convert the value obtained from the environment into objects.
- In setupContainerAskForRM(), the follow two things need some set up:
- Resource capability: Currently, YARN supports memory based resource requirements so the request should define how much memory is needed. The value is defined in MB and has to less than the max capability of the cluster and an exact multiple of the min capability. Memory resources correspond to physical memory limits imposed on the task containers. It will also support computation based resource (vCore), as shown in the code.
- Priority: When asking for sets of containers, an AM may define different priorities to each set. For example, the Map-Reduce AM may assign a higher priority to containers needed for the Map tasks and a lower priority for the Reduce tasks' containers. After container allocation requests have been sent by the application manager, contailers will be launched asynchronously, by the event handler of the AMRMClientAsync client. The handler shouldimplement AMRMClientAsync.CallbackHandler interface.
- When there are containers allocated, the handler sets up a thread that runs the code to launch
- containers. Here we use the name LaunchContainerRunnable to demonstrate. We will talk about theLaunchContainerRunnable class in the following part of this article.
- heNMClientAsync object, together with its event handler, handles container events. Including
- container start, stop, status update, and occurs an error.
- After the ApplicationMaster determines the work is done, it needs to unregister itself through the AMRMclient, and then stops the client.

Conclusions

Thus the procedure to mount the one node Hadoop cluster using FUSE was executed successfully