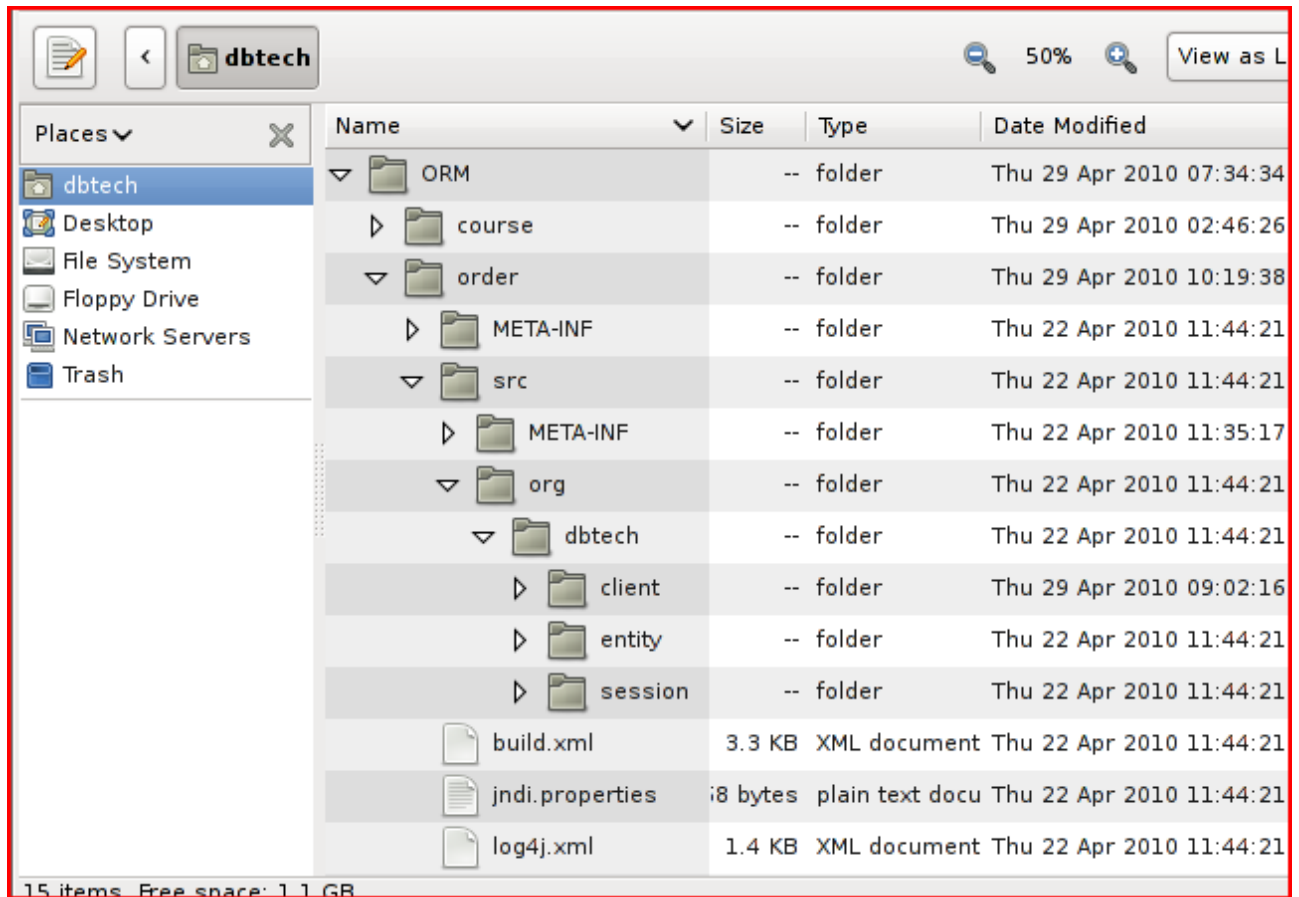


ORM SOFTWARE DEVELOPMENT ENVIRONMENT

1. Login into Unix. Your current directory is `/home/dbtech`
2. The order application is in `/home/dbtech/ORM/order` directory. Java programs are in the `src` directory.



Open editor and see the entity classes, session beans and Java client.

Entities:

`Customer.java`
`Product.java`
`Order.java`
`LineItem.java`
`Address.java`, embeddable class

Session beans:

`ManageCustomer` interface, `ManageCustomerBean`
`ManageProduct` interface, `ManageProductBean`
`ManageOrder` interface, `ManageOrderBean`

Client

`Client.java`

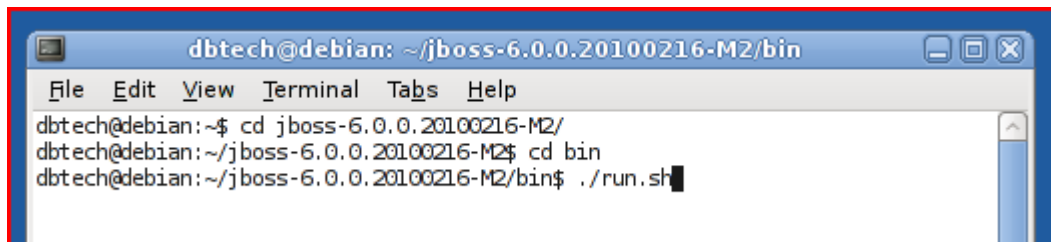
3. JBoss application server

We run our applications in JBoss application server. The relational database is Hypersonic.

For starting and shutdown in the JBoss server you need two terminal window.

Starting JBoss server:

Open terminal window.

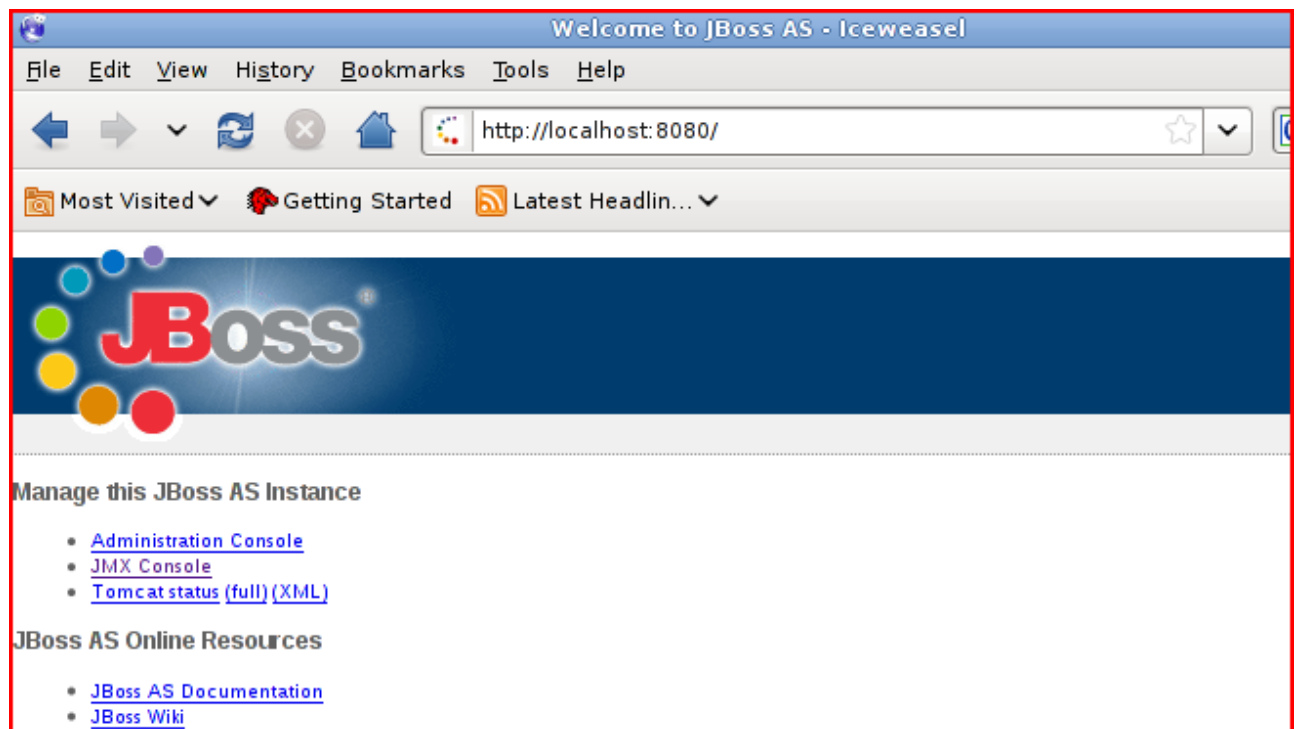


```
dbtech@debian: ~/jboss-6.0.0.20100216-M2/bin
File Edit View Terminal Tabs Help
dbtech@debian:~$ cd jboss-6.0.0.20100216-M2/
dbtech@debian:~/jboss-6.0.0.20100216-M2$ cd bin
dbtech@debian:~/jboss-6.0.0.20100216-M2/bin$ ./run.sh
```

Change the current directory to: /home/dbtech/jboss-6.0.0.20100216-M2/bin and enter command: ./run.sh

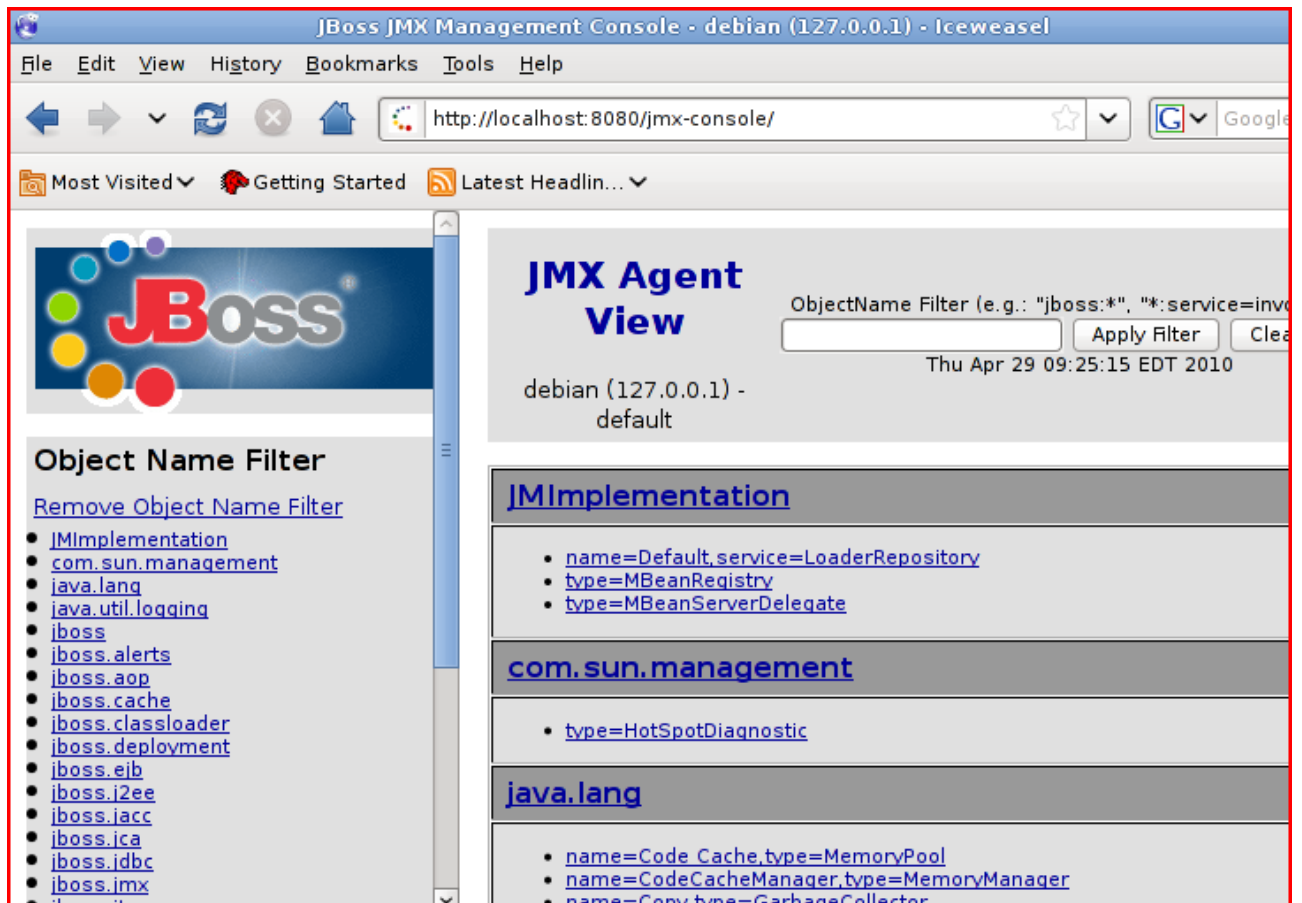
Starting takes about 1 minute. When JBoss has started, you see the text: Started in 49s:325ms

Start web browser and write address: http://localhost:8080. You can see JBoss running.



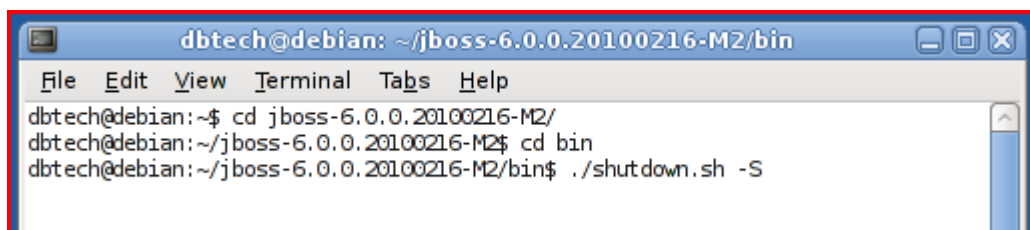
Choose **JMX Console** or write in web browser address:

http://localhost:8080/jmx-console/



Shutting down JBoss server:

Open terminal window.



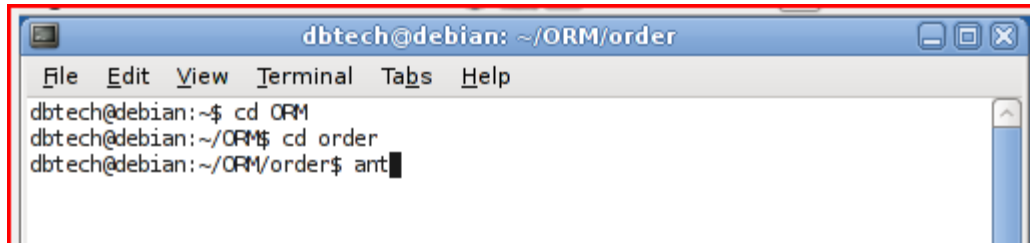
Change the current directory to: `/home/dbtech/jboss-6.0.0.20100216-M2/bin`
and enter command: `./shutdown.sh -S`

4. Running program

Start JBoss server.

For running the program you need the third terminal window. So open terminal window.

Change the current directory to: `/home/dbtech/ORM/order`

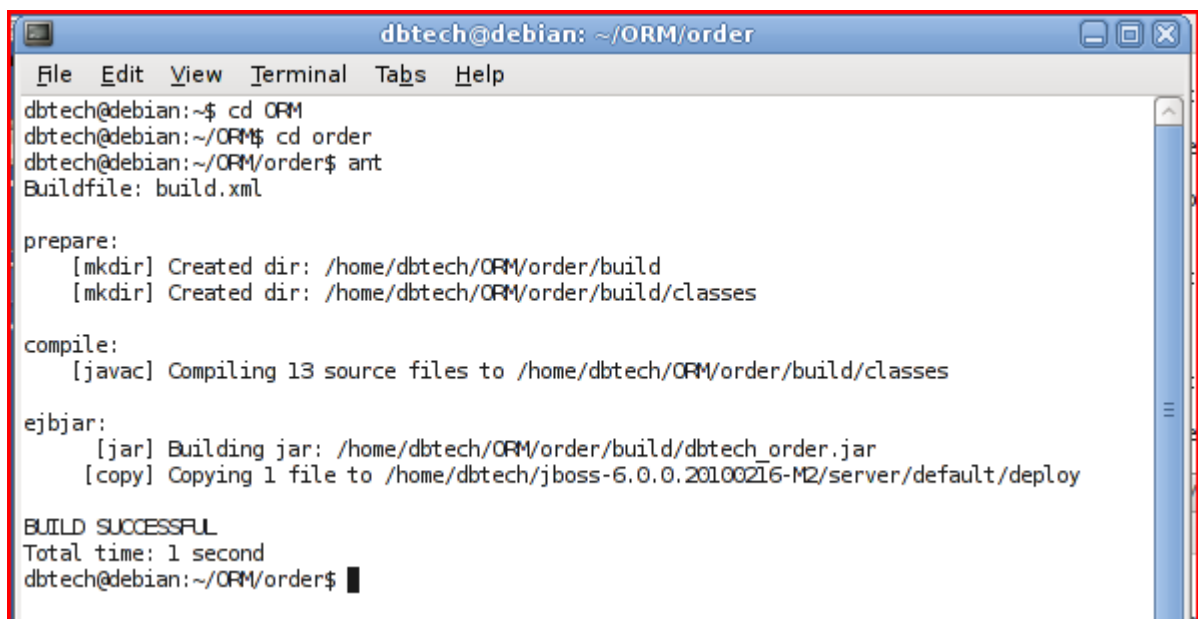


```
dbtech@debian: ~/ORM/order
File Edit View Terminal Tabs Help
dbtech@debian:~$ cd ORM
dbtech@debian:~/ORM$ cd order
dbtech@debian:~/ORM/order$ ant
```

We use an ant tool for compiling, building, deploying, running and undeploying of our program and also for cleaning of the database.

For compiling, building and deploying of the order program enter: ant

You see in terminal window compiling, building and deploying of the order program.



```
dbtech@debian: ~/ORM/order
File Edit View Terminal Tabs Help
dbtech@debian:~$ cd ORM
dbtech@debian:~/ORM$ cd order
dbtech@debian:~/ORM/order$ ant
Buildfile: build.xml

prepare:
  [mkdir] Created dir: /home/dbtech/ORM/order/build
  [mkdir] Created dir: /home/dbtech/ORM/order/build/classes

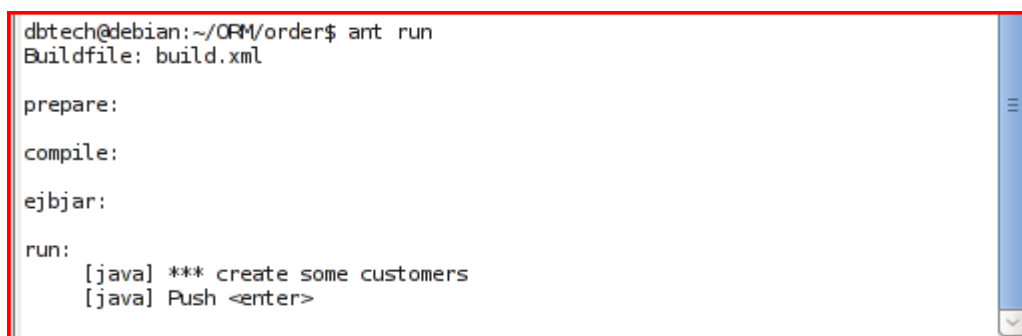
compile:
  [javac] Compiling 13 source files to /home/dbtech/ORM/order/build/classes

ejbjar:
  [jar] Building jar: /home/dbtech/ORM/order/build/dbtech_order.jar
  [copy] Copying 1 file to /home/dbtech/jboss-6.0.0.20100216-M2/server/default/deploy

BUILD SUCCESSFUL
Total time: 1 second
dbtech@debian:~/ORM/order$
```

Run the program by entering: ant run

You can see, how the client program ask: Push <enter>



```
dbtech@debian:~/ORM/order$ ant run
Buildfile: build.xml

prepare:

compile:

ejbjar:

run:
  [java] *** create some customers
  [java] Push <enter>
```

Push <enter>

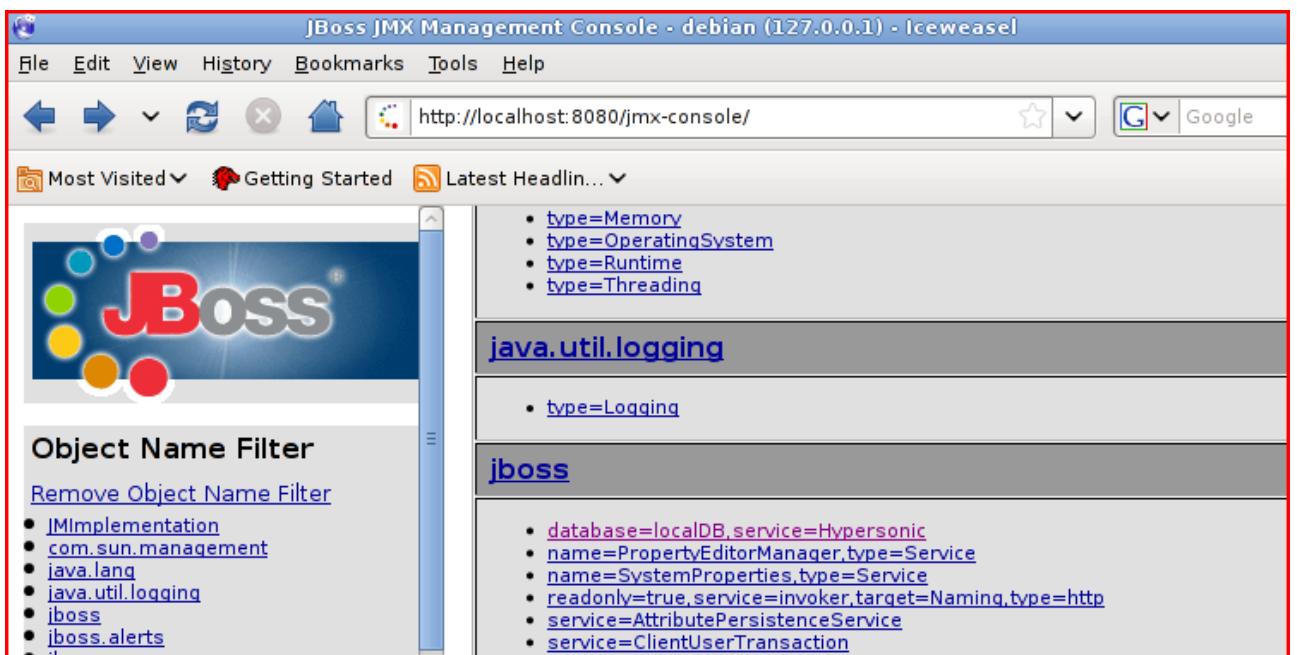
You can see following.

```
run:
[java] *** create some customers
[java] Push <enter>

[java] *** Customers created ***
[java] *** create some products ***
[java] Push <enter>
```

The application has created some Customer –instances to the database.

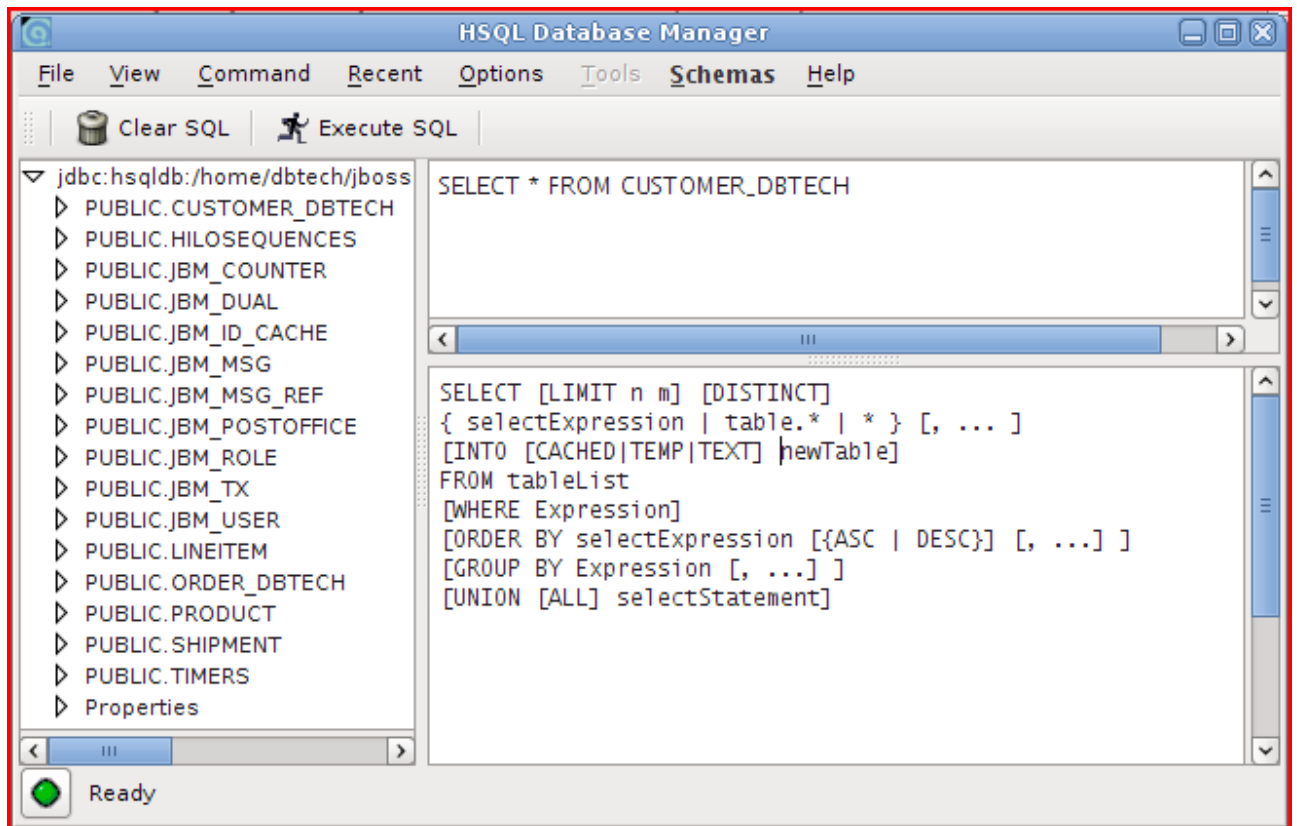
For starting the Database Manager, firstly start JBoss JMX Console, scroll down to **jboss** section and select link: `database=localDB,service=Hypersonic`



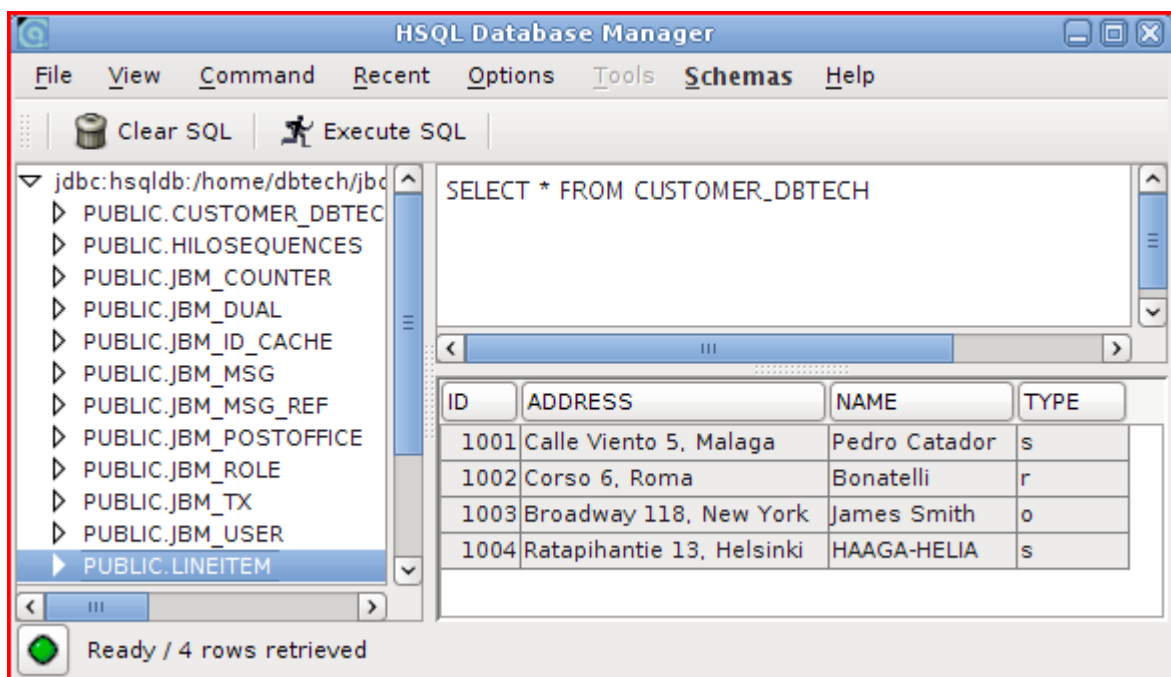
Scroll down in **JMX MBean View** to **Operation** section and **startDatabaseManager** operation and push **Invoke** button.

Operation	Return Type	Description	Parameters
destroy	void	MBean Operation.	[no parameters] <input type="button" value="Invoke"/>
stop	void	MBean Operation.	[no parameters] <input type="button" value="Invoke"/>
create	void	MBean Operation.	[no parameters] <input type="button" value="Invoke"/>
startDatabaseManager	void	MBean Operation.	[no parameters] <input type="button" value="Invoke"/>
start	void	MBean Operation.	[no parameters] <input type="button" value="Invoke"/>

HSQL Database Manager application starts (see below). You can see in left tables of our application: PUBLIC.CUSTOMER_DBTECH, LINEITEM, ORDER_DBTECH, PRODUCT and SHIPMENT. Write in right SELECT * FROM CUSTOMER_DBTECH.



Write in right SELECT * FROM CUSTOMER_DBTECH.



Push <enter> in the terminal window and program will create products.

```
[java] *** Customers created ***
[java] *** create some products ***
[java] Push <enter>

[java] *** Products created ***
[java] *** Do some queries about customer and products
[java] Push <enter>
```

See in the **HSQL Database Manager** Product table.

Push <enter> , run all tasks and see tables in the database:

- do some queries about customer and products
- create some orders
- show orders
- do some shipments
- show shipments

You can undeploy the program and clean the environment: `ant clean`

```
dbtech@debian:~/CRM/order$ ant clean
Buildfile: build.xml

clean:
  [delete] Deleting directory /home/dbtech/CRM/order/build
  [delete] Deleting: /home/dbtech/jboss-6.0.0.20100216-M2/server/default/deploy/dbtech_order.jar

BUILD SUCCESSFUL
Total time: 0 seconds
dbtech@debian:~/CRM/order$
```

You can clear the database: `ant clean.db`

```
Total time: 0 seconds
dbtech@debian:~/CRM/order$ ant clean.db
Buildfile: build.xml

clean.db:

BUILD SUCCESSFUL
Total time: 0 seconds
dbtech@debian:~/CRM/order$
```

Next try to run course application in the `/home/dbtech/CRM/course` directory:

- `ant` compile, build, deploy
- `ant run` run client
- `ant clean` undeploy, clean environment
- `ant clean.db` clear database