Apache Derby and Red Hat Application Server: JOnAS Integration

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1 Introduction

Apache Derby was tested to run with Red Hat Application Server: JOnAS. This document provides the details on how to configure and run Apache Derby with Red Hat Application Server. It provides some brief introduction to Red Hat Application Server, and later describes the environment requirements, the installation details, and the steps to run Apache Derby with Red Hat Application Server.

1.1 Notes

This document contains URLs to install Red Hat Application Server and Apache Derby. The URLs may change anytime. If there is any problem with any URL, post it to the derby mailing list (derby-dev@db.apache.org).

1.2 Document Conventions

The conventions in this document are as following:

`Courier font`
Courier font represents `commands`, `file names` and `paths`, and `prompts`.

bold Courier font
Bold Courier font represents text that you are to type, such as: **jonas start**

`Italic Courier font`
Italic Courier font represents a variable, such as an installation directory: `install_dir.`

2 Red Hat Application Server: JOnAS

Red Hat Application Server is a middleware platform. It is layered between the operating system and applications. This middleware links systems and resources that are scattered across the network. [1]

Red Hat Application Server comprises a runtime system and associated development libraries for creating and deploying Java-based Web applications with dynamic content (for example, dynamic Web sites, portal servers, and content management systems). These applications might retrieve, display, or update data in database management systems or they might communicate with standard application software, such as ERP systems, or with proprietary legacy applications. [1]

Red Hat Application Server is a robust platform for the development and deployment of Web applications written in Java and built with JSP, servlet, and Enterprise JavaBeans (EJB) technologies. It has been built to standard protocols and APIs that have emerged from Java, J2EE, Web Services, SOAP (Single Object Access Protocol), XML (Extensible Markup Language), and CORBA (Common Object Request Broker Architecture) standards groups. Developers build their applications using these standards, while Red Hat's middleware infrastructure ensures compatibility with the guidelines set forth by the J2EE specifications. [1]

3 Environment

This section lists the environment requirements to run Apache Derby with Red Hat Application Server.

- Red Hat Enterprise Linux 3
- A Java2 Software Development Kit (SDK) version 1.4
- Ant

The above are the requirements for Red Hat Application Server.
For more information, check out Red Hat Application Server installation Guide (http://www.redhat.com/docs/manuals/rhaps/install-guide).

4 Installation

4.1 Install Red Hat Application Server

Install Red Hat Application Server by following the instructions in Red Hat Application Server Installation Guide (http://www.redhat.com/docs/manuals/rhaps/install-guide).

After installing Red Hat Application Server, you will have a new directory where you have installed Red Hat Application Server. This directory will be referred to as the *rhat_app_server_install_dir* in the rest of this document.

4.2 Download Apache Derby

Download Apache Derby (derby.jar, derbynet.jar, derbytools.jar) by following the instructions at (http://incubator.apache.org/derby/derby_downloads.html).

After downloading Apache Derby, you will have a new directory where you have downloaded Apache Derby. This directory will be referred to as the *derby_install_dir* in the rest of this document.

5 Steps to configure and run Derby and Red Hat Application Server

This section provides the information on configuring and running Red Hat Application Server with Apache Derby.

5.1 Setting up environment

Export the following variables:

```
>export JAVA_HOME=jdk_install_dir
>export JONAS_ROOT=rhat_app_server_install_dir
>export ANT_HOME=ant_install_dir
```

```
>export
PATH=${PATH}:${JONAS_ROOT}/bin/unix:${JAVA_HOME}/bin:${ANT_HOME}
```

Where
- *jdk_install_dir* is the directory where you have installed Java2 Software Development Kit (SDK) version 1.4.
- *rhat_app_server_install_dir* is the directory where you have installed Red Hat Application Server.
- *ant_install_dir* is the directory where you have installed Ant.

5.2 Building the example

The Red Hat Application Server installation includes the source code for several examples. Before using the examples, the source code needs to be compiled. To compile the source code, go to the directory $JONAS_ROOT/examples/src and run the following command:

```
>ant -find build.xml install
```

5.3 Database access

The examples must be able to access Apache Derby. Do the following to configure Apache Derby access:

- Edit file jonas.properties in directory $JONAS_ROOT/conf as follows:
  ```
  jonas.service.dbm.datasources  derbytest
  ```

- Create a properties file derbytest.properties in directory $JONAS_ROOT/conf for Derby database with the following content:
  ```
  jdbc.minconpool=0
  jdbc.maxconpool=-1
  datasource.classname=org.apache.derby.jdbc.EmbeddedDriver
  datasource.url=jdbc\:derby\:testdb;create\=true
  jdbc.connmaxage=30
  jdbc.conncklevel=1
  datasource.description=Derby test db
  datasource.mapper=rdb
  jdbc.connteststmt=SELECT 1
  datasource.name=jdbc_1
  ```

- Make Derby jar files accessible by doing as follows:

  - Change directory to be $JONAS_ROOT/lib/ext

  - Create links as follows:
    ```
    >ln –s derby_install_dir/lib/derby.jar .
    >ln –s derby_install_dir/lib/derbynet.jar .
    >ln –s derby_install_dir/lib/derbytools.jar .
    ```

5.4 Creating a Database

A database needs to be created prior to running an example. Create a database as follows:

- Open another terminal window.

- Change directory to where ever you want to create database (eg: user home directory).

- Export CLASSPATH as follows:
  ```
  export CLASSPATH=derby_install_dir/lib/derby.jar:
  derby_install_dir/lib/derbytools.jar
  ```

- Run the following command to start Derby command line processor:
  ```
  >java org.apache.derby.tools.ij
  ```

- At prompt ij>, issue the following commands:

  ```
  ij>connect 'jdbc:derby:testdb;create=true';
  ij>create table accountsample_ (
     accno_      integer not null primary key,
     customer_   varchar(30),
     balance_    decimal(15, 4)
  );
  ij>insert into accountsample_ values(101, 'Antoine de St
  Exupery', 200.00);
  ij>insert into accountsample_ values(102, 'alexandre
  dumas fils', 400.00);
  ij>insert into accountsample_ values(103, 'conan doyle',
  500.00);
  ij>insert into accountsample_ values(104, 'alfred de
  musset', 100.00);
  ij>insert into accountsample_ values(105, 'phileas
  ebegue', 350.00);
  ij>insert into accountsample_ values(106, 'alphonse de
  lamartine', 650.00);
  ```

5.5 Running the EB example

- Go back to terminal in which you exported all the variables described in section 5.1 of this document.

- Change directory to a directory where you have created Derby database (testdb) in section 5.4 of this document.

- Start the JOnAs server with the following command:
  ```
  >jonas start
  ```

- Load the eb.jar file with the following command:
  ```
  >jonas admin -a eb.jar
  ```

- Start java client with the following command:
  ```
  >jclient eb.ClientAccount AccountImplHome
  ```

  The output should be as following:
  ```
  Getting a UserTransaction object from JNDI
  Connecting to the AccountHome
  Getting the list of existing accounts in database
  101 Antoine de St Exupery 200.0
  102 alexandre dumas fils 100.0
  103 conan doyle 500.0
  104 alfred de musset 100.0
  105 phileas lebegue 350.0
  106 alphonse de lamartine 650.0
  Creating a new Account in database
  Finding an Account by its number in database
  Starting a first transaction, that will be committed
  Starting a second transaction, that will be rolled back
  Getting the new list of accounts in database
  101 Antoine de St Exupery 200.0
  102 alexandre dumas fils 300.0
  103 conan doyle 500.0
  104 alfred de musset 100.0
  105 phileas lebegue 350.0
  106 alphonse de lamartine 650.0
  109 John Smith 100.0
  Removing Account previously created in database
  ClientAccount terminated
  ```

- Stop the JOnAS server with the following command:
  ```
  >jonas stop
  ```

6 Summary

In this document, setup instructions have been described to run Apache Derby with Red Hat Application Server. Apache Derby was integrated with Red Hat Application Server by following instructions in Red Hat Application Server: JOnAs - Installation Guide, Tutorial, and User Guide. Most of the instructions given in Red Hat Application Server: JOnAs - Installation Guide, Tutorial, and User Guide were based on other databases. The main idea of this document was to provide instructions specific to Derby database. Therefore, some instructions were modified to make them work with Derby database.

7 References

[1] Red Hat Application Server: JOnAs User Guide,
http://www.redhat.com/docs/manuals/rhaps/jonas-guide

[2] Red Hat Application Server: JOnAs Tutorial,
http://www.redhat.com/docs/manuals/rhaps/jonas-tutorial/

[3] Red Hat Application Server: JOnAs Installation Guide,
http://www.redhat.com/docs/manuals/rhaps/install-guide/