

Using the LiquidApps® Motif Native Renderer

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1 Overview

LiquidApps communicates with a separate program called the Motif Render Server (MRS) to produce Motif UI images as the user designs a Motif UI in LiquidApps. This document explains how to setup a machine to run the Motif Render Server, and configure LiquidApps to use it.

The MRS is a Linux / Motif based application, so it must be run on a Linux machine. However it's possible for a user of LiquidApps to connect to the MRS remotely via the internet from a Windows or OS X system.

2 Setting Up a Linux Machine

The following instructions assume you run the MRS on an Ubuntu Desktop 64-bit system. Additional notes specific to CentOS are provided in some sections.

A disk image to install Ubuntu can be obtained free from:

<http://www.ubuntu.com/download/ubuntu/download>

Rather than install Ubuntu on a physical machine, you can run it on a virtual machine. We recommend using VMware Player, which can also be obtained free from:

<http://www.vmware.com/products/player/overview.html>

Thorough documentation can be found on both the Ubuntu and VMware websites for configuring these two components.

Also, you must have a working Java Runtime Environment (JRE) on the machine running MRS. It's available free at <http://www.java.com>.

3 Installing Dependencies

The MRS depends on a few other packages listed in the table below which shows the Ubuntu package name on the left and the equivalent CentOS package name on the right.

You can install packages on Ubuntu using apt-get or Synaptic. On CentOS you would use yum. For CentOS, use the command found below:

```
sudo yum install libX11-devel libXt-devel openmotif-devel gcc gcc-c++
```

Ubuntu	CentOS
libX11-dev	libX11-devel
libxt-dev	libXt-devel
libmotif-dev	openmotif-devel
g++	gcc, gcc-c++
make	(n/a)

4 Installing MRS

The MRS binary can be placed anywhere desired on the host. For multi-user access `/etc/opt/LiquidApps_MotifRenderServer` might be a good location. Otherwise it can simply be placed somewhere in your home folder.

Make sure after copying the MRS binary that it is marked as executable on the host machine. For example:

1. Right click on the MotifRenderServer file.
2. Select Properties.
3. Switch to the Permissions tab.
4. Ensure the box labeled 'Executable' is checked.

4.0.1 Using MRS with LiquidApps

There are two ways to use MRS with LiquidApps. If you are running LiquidApps on the same Linux machine where MRS is installed you can have LiquidApps automatically start and stop MRS for you. Otherwise you can start MRS manually outside of LiquidApps, and have

LiquidApps connect to it. The latter mode will work regardless whether LiquidApps and MRS are on the same or different machines.

Automatic Mode

In this mode you are running LiquidApps on the same machine with MRS. LiquidApps can handle starting and stopping MRS for you once you tell LiquidApps where the MRS binary is on your system. To do this, perform the following steps:

1. Note the path where you installed MRS, for this example we'll assume **/home/user1/MotifRenderServer**
2. Start LiquidApps.
3. Switch to the *Workbench* tab in the ribbon bar.
4. Select *Preferences*.
5. Expand *Renderer Preferences*.
6. Select *Motif Native Renderer*.
7. In the field labeled *MotifRenderServer Command* enter the path to MRS, e.g.: **/home/user1/MotifRenderServer**
8. Press the OK button to save these settings.

Now you can create a Motif User Interface and LiquidApps will automatically start MRS and stop it when you close LiquidApps.

Manual Mode

In this mode you will start and stop MRS yourself as desired and simply tell LiquidApps how to connect to it.

1. From a console, start MRS, using `./MotifRenderServer`.
This will allow you to see output from MRS including the port number that it is listening on for incoming connections (from LiquidApps).
2. Note the port number that MRS is listening on. You will see output in the console similar to the following:

```
establishing server socket...  
server listening on port 49803  
Waiting for client connection or 'shutdown' command from  
terminal.
```

In this case the port number is 49803.

3. Start LiquidApps; LiquidApps can be running on the same or a different machine.
4. In LiquidApps, switch to the *Workbench* tab in the ribbon bar.
5. Select *Preferences*.
6. Expand *Renderer Preferences*.
7. Select *Motif Native Renderer*.

8. In the *Address* field, enter the IP address of the machine where MRS is running. If it is the same machine as LiquidApps you can enter *localhost*.
9. In the *Port* field, enter the port number that MRS is listening on for connections. In this example we noted the port number *49803*.
10. Make sure the *MotifRenderServer Command* field is **empty**.
11. Click OK to save these settings.

LiquidApps will attempt to contact the MotifRenderServer and will report whether the settings you entered are correct.

You should now be able to create a Motif User Interface, and LiquidApps will connect to the MRS instance you specified.

When you are done using MRS you should stop it by entering *shutdown* in the console where you started it. While it's possible to simply kill the server process, this may leave temporary resources (like image files) sitting in your */tmp* folder.

4.1 Additional Features

Regardless whether you start MRS from the command line or have LiquidApps start it automatically, you can specify these additional arguments following the MotifRenderServer file name:

MotifRenderServer [-display {display number}] [port]

-display {display number}

This tells MRS to use the specified X display. The primary usage for this is to take advantage of Xvfb (X Virtual Frame Buffer) to run MRS in a hidden display so you don't see the windows it creates.

An example of usage follows:

1. Start Xvfb with a command such as:

```
Xvfb :1 -screen 0 1280x1024x24
```

2. Specify the display number (:1) when starting MRS, e.g.:

```
MotifRenderServer -display :1
```

[port]

You can specify a specific port for MRS to use. MRS will try to use that port if it is available. Otherwise it will choose a random available port. An example of use is:

```
MotifRenderServer 55555
```

This would start MRS on port 55555.

4.2 Troubleshooting

If you are unable to connect to the MRS from LiquidApps, the server firewall may be blocking the port. If your server is running *iptables*, follow these instructions to allow connections on the MRS port:

For Red Hat, CentOS, and Fedora Linux distributions:

1. Open the file `/etc/sysconfig/iptables` in an editor.
2. Append the new rule to the existing list of rules in the file:

```
-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport PORT -j ACCEPT
```

Where `PORT` is the number of the port you wish to use for the MRS.
3. Restart the *iptables* service by issuing the command `service iptables restart`.

On Red Hat and CentOS you may also need to start Xvfb with the `-ac` flag to disable access control restrictions that would prevent the MotifRenderServer from communicating with Xvfb.

Example:

```
Xvfb :1 -ac -screen 0 1280x1024x24
```

Another way to rectify this issue is to stop running *iptables* altogether with the following command:

```
sudo /etc/init.d/iptables stop
```