

How to Guide: Setup Device Mapper Raid Event Monitoring

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Overview

This document will guide a user in how to setup event monitoring for a device mapper raid device.

*(*Note: It is assumed for this demo that the user will be setting this up on a Fedora or RedHat Enterprise Linux OS installation. If this is not the case the user will have to adjust some of the scripts and procedures to match their specific operating system.)*

Files Used In This Document

- dm-raid45-2.6.25-rc2_20080221.patch.bz2
- dm_dso_reg_tool-1.0.0.rc1.tgz
- libdmraid-events_DSO-1.0.0.rc2.tgz
- Logwatch_Dmeventd_Setup_Files.tgz

Files Referenced In This Document

- HOWTO - LogWatch Setup For Dmeventd_0.71.pdf

Setup

1. Rebuild Device Mapper Source To Build "dmeventd"

I. Get the latest device mapper source package from:

<ftp://sources.redhat.com/pub/dm/>

*(*Note: As of the writing of this document the latest revision is [device-mapper.1.02.24.tgz](ftp://sources.redhat.com/pub/dm/device-mapper.1.02.24.tgz))*

II. Place the file in a directory you have full access to (*home directory, etc...*).

III. Run the following command at the shell prompt:

```
$ tar -zxvf device-mapper.1.02.24.tgz
```

IV. This will result in the directory device-mapper.1.0.24 being created

V. Enter into the top level of this directory structure (device-mapper.1.0.24) and run the following command at the shell prompt:

```
$ ./configure --enable-dmeventd
```

This will configure the makefile to build the dmeventd daemon

VI. Finally, run the following commands as the root user at the shell prompt:

```
$ make
```

```
$ sudo make install
```

*(*Note: that last command needs to be ran with sudo or as the root user.)*

VII. You will now have the latest version of the device mapper utilities installed on your system along with the dmeventd daemon

2. Install the Linux Kernel Patches

As you'll note from the "Overview" section at the beginning of this document theres a kernel patch listed:

- dm-raid45-2.6.25-rc2_20080221.patch.bz2

Install Using "Patch" Utility

- I. Download a base kernel from ftp.kernel.org (the 2.6.25-rc2 release).
- II. Untar/unzip the kernel source into a directory that you have full access to if not operating as the root user.
- III. Move the patch "dm-raid45-2.6.25-rc2_20080221.patch.bz2" into the top level kernel directory.
- IV. Unzip the patch using the "bunzip2" utility. *(This will leave a file called "dm-raid45-2.6.25-rc2_20080221.patch" in place of the original.)*
- V. Make sure you're in the top level kernel directory. Using the "patch" utility run the following command:

```
$ patch -p1 < dm-raid45-2.6.25-rc2_20080221.patch
```
- VI. Finally rebuild & install the kernel.

*(*Note: This will not be covered here. You can find information on how to perform this in my other document "How to Guide - Linux Quick Tips & Tricks.pdf". If this is insufficient greater detail can also be found on this subject from numerous Internet websites.)*

3. Build & Install the DSO

- I. Copy the file "libdmraid-events_DSO-1.0.0.rc2.tgz" to a directory you have full access to if not running as the root user.
- II. Untar/unzip the file. Now, depending whether or not your running an i386 version of the OS or running an x86_64 version you'll need to change the default library location inside of the make file.
 - If your running an X86_64 bit OS you can continue to step III.
 - If your running an i386 distribution you'll need to change the

following line in the "Makefile" found in the package:

```
LIB_DIR=/usr/lib64
```

change the "lib64" to just "lib", so the line will look like:

```
LIB_DIR=/usr/lib
```

This change will make sure the DSO is loaded into the expected location for dynamic libraries.

III. Finally, run the following commands as the root user at the shell prompt:

```
$ make
```

```
$ make install
```

This will build and install the DSO library libdmraid-events.so.0.0 in /usr/lib[XX] and create the necessary symbolic links to the version less names:

```
ls -l /usr/lib64/libdmraid-event*
lrwxrwxrwx 1 root root /usr/lib64/libdmraid-events.so -> libdmraid-events.so.0
lrwxrwxrwx 1 root root /usr/lib64/libdmraid-events.so.0 -> libdmraid-events.so.0.0
-rwxr-xr-x 1 root root /usr/lib64/libdmraid-events.so.0.0
```

4. Build & Install the Device Mapper DSO Registration Utility

I. Copy the file "dm_dso_reg_tool-1.0.0.rc1.tgz" to a directory you have full access to if not running as the root user.

II. Untar/unzip the file and run the following commands as the root user at the shell prompt:

```
$ make
```

```
$ make install
```

This will build and install the DSO utility along with its associated man page:

```
ls -l /sbin/dm*
-r-xr-xr-x 1 root root /sbin/dm_dso_reg_tool
-r-xr-xr-x 1 root root /sbin/dmeventd
-rwxr-xr-x 1 root root /sbin/dmraid
-rwxr-xr-x 1 root root /sbin/dmraid.static
-r-xr-xr-x 1 root root /sbin/dmsetup
-rwxr-xr-x 1 root root /sbin/dmsetup.static

ls -l /usr/share/man/man8/dm*
-rw-r--r-- 1 root root /usr/share/man/man8/dm_dso_reg_tool.8
-rw-r--r-- 1 root root /usr/share/man/man8/dmesg.8.gz
-rw-r--r-- 1 root root /usr/share/man/man8/dmidecode.8.gz
-r--r--r-- 1 root root /usr/share/man/man8/dmraidtest.8.gz
-r--r--r-- 1 root root /usr/share/man/man8/dmsetup.8
-r--r--r-- 1 root root /usr/share/man/man8/dmsetup.8.gz
```

III. To find out the features and view some sample usage for this utility run the following command at a terminal shell prompt:

```
$ man dm_dso_reg_tool
```

Appendix

Putting It All Together

- This is the order in which all of the pieces of device mapper event monitoring should be started to make it into a fully functional solution:
 - I. After the system boots up, run the command "dmraid -ay" as the root user to activate all of the dmraid volumes on the system that have metadata present.

*(*Note: If the system cannot find the "dmraid" command it might not be in your path. By default it is stored in the /sbin directory; if you add the /sbin/dmraid to the call above it should fix any path issues.)*
 - II. Start the device mapper daemon by running the command "dmeventd" as the root user.

*(*Note: If the system cannot find the "dmeventd" command it might not be in your path. By default it is stored in the /sbin directory; if you add the /sbin/dmeventd to the call above it should get past any path issues.)*
 - III. Finally, run the command "dm_dso_reg_tool -r isw_XXXXXXXXX_Volume0 libdmraid-events.so". This will register the raid volume "isw_XXXXXXXXX_Volume0" with dmeventd and associate all event processing with the DSO "libdmraid-events.so". For example:

```
$ dm_dso_reg_tool -r isw_defeaigdde_Volume0_raid0 libdmraid-events.so
The device "isw_defeaigdde_Volume_raid0" has been registered with
dmeventd
```

*(*Note: If you would like to see information about the volume once its registered just run the command "dm_dso_reg_tool -m". This will display all the registered devices with their associated underlying monitored hardware.)*

Configuring dmeventd To Start-Up At Boot Time

- TBD

Troubleshooting

■ No Events Generated For Raid 1 Devices

If you're setup for event monitoring and a device within that volume group encounters an error there should be an event generated. If this does not occur as expected run the following command to make sure the device mapper table has the proper parameters for processing:

```
$ /sbin/dmsetup table
```

```
isw_cijcgddfhhb_vol0: 0 488390920 mirror core 2 131072 nosync 2 8:16 0
8:32 0 1 handle_errors
```

*In the output displayed to the screen you should see a "1 handle_errors" at the end of the line describing the stored data for the Raid 1 volume group that is to be monitored. If this is not present you need to update your version of the utility "dmraid" to the latest version dmraid-1.0.0.rc**.*

*(*Note: At the present time the latest release of dmraid "dmraid-1.0.0.rc14-6" is posted on the maintainers website; link is available at the end of this document. This and all subsequent versions of dmraid contain the necessary code for Raid 1 activation)*

■ **User Cannot Register Volume Group With Dmeventd**

There could be a couple of reasons why this might be happening:

- If you have a bootable volume group that the operating system has been installed on, *at this time*, there will not be a UUID associated when the system comes up. This will prevent the registration of this volume group with dmeventd.

This is due to the initrd kernel image not having the updated dmraid activation patch. (In the case of the Anaconda installer for Fedora/RedHat Enterprise Linux this is where the changes would need to be integrated by the installers maintainer).

- If you're using an old version of the dmraid utility that does not contain the code patch for generating a UUID for a volume group upon activation.

Notes About Example Used In This Document

- All examples in this document assume the user has basic Linux knowledge.
- The Author takes no responsibility for what happens to your system by using this guide. All instructions and testing should be on a non-production system before deploying to general service.
- As of the time of this writing both Fedora 8 and RedHat Enterprise Linux 5.x were able to build all of the items described in this document; your experiences may vary in future operating system releases.

Other Reading/Learning Material

- Kernel Documentation & How-To Build Guide: <http://www.kernel.org/doc/>
- DMRAID maintainers homepage: <http://people.redhat.com/heinzm/>