
DRLM Documentation

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Brain Updaters, S.L.L.

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DRLM Docs contains comprehensive documentation on the DRLM (Disaster Recovery Linux Manager). This page describes documentation's licensing, editions, and versions, and describes how to contribute to the DRLM Docs.

For more information on DRLM, see [About DRLM Project](#)¹. To download DRLM, see the downloads page.

¹ <http://drlm.org>

License

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Contributing

Please, we encourage you to help us to improve this documentation.

To contribute to documentation the Github interface enables users to report errata or missing sections, discuss improvements and new sections through the issue-tracker at: [DRLM Docs GitHub Issue Tracker](https://github.com/brainupdaters/drlm-docs/issues)³.

Note: This documentation is under constant development. Please be patient...

³ <https://github.com/brainupdaters/drlm-docs/issues>

Contents:

3.1 DRLM Quick Start Guide

3.1.1 DRLM Installation

Follow the steps at [DRLM Installation](#)⁴. (Select your OS)

3.1.2 Add Network to DRLM Server

First of all we must add the network where the ReaR clients are. To do this we have to use the command “drlm addnetwork” with the parameters -i “Network IP” network”, -g “Gateway IP”, -s “Server IP of the network”, -n “Network Name” and -m “Netmask”.

```
$ drlm -vD addnetwork -i 192.168.1.0 -g 192.168.1.1 -s 192.168.1.38 -n BuLan -m 255.255.255.0
```

3.1.3 Add Client to DRLM Server

Now we can add a ReaR client with the command “drlm addclient” and the parameters -n “Network Name”, -i “ReaR client IP”, -M “ReaR client MAC address” and -c “ReaR client hostname”.

```
$ drlm -vD addclient -n BuLan -i 192.168.1.45 -M 00:13:20:fe:48:16 -c ReaRCli1
```

3.1.4 ReaR Client Installation

Follow the steps at [ReaR Client Installation](#)⁵. (Select your OS)

3.1.5 Run Client Backup

We are ready to take OS backups!!! At this point we have the DRLM server and ReaR client configured, you just have to run the command “drlm runbackup” with the parameter -c “ReaR client host name”

```
$ drlm -vD runbackup -c ReaRCli1
```

⁴ <http://docs.drlm.org/en/latest/Install.html#drlm-installation>

⁵ <http://docs.drlm.org/en/latest/ClientConfig.html#rear-client-installation>

3.1.6 Restore Client Backup

Follow the steps at [DRLM Client Recover](#)⁶.

3.2 DRLM Installation

The purpose of this manual is explain, step by step, the installation and configuration of DRLM. At the end of this guide you should have a fully functional DRLM server.

3.2.1 Debian 8

Note: On the following steps, is assumed you have a minimal installation of Debian 8.

Install requirements

```
$ apt-get install openssh-client openssl netcat-traditional wget gzip tar gawk sed grep coreutils ut
```

Get DRLM

You can obtain the DRLM package building it from the source code or downloading from www.drlm.org website

Build DEB package from Source

```
$ aptitude install git build-essential debhelper
$ git clone https://github.com/brainupdaters/drlm
$ cd drlm
$ make deb
```

Download DEB package From DRLM Web

```
$ wget http://www.drlm.org/downloads/drlm_2.0.0_all.deb
```

Install DRLM package

The DEB package can be installed as follows (on Debian, Ubuntu)

Execute the next command:

```
$ dpkg -i drlm_2.0.0_all.deb
```

DRLM Components Configuration

This section covers configuration of:

- GRUB
- TFTP Service

⁶ <http://drlm-docs.readthedocs.org/en/latest/Restore.html>

- NFS Service
- DHCP Service
- HTTP Service

Configuring loop limits

The default configuration allows up to eight active loop devices. If more than eight file-based guests or loop devices are needed the number of loop devices configured can be adjusted adding the parameter `max_loop=1024` in the `/etc/default/grub` file as follows:

```
...
GRUB_CMDLINE_LINUX="quiet max_loop=1024" ##UPDATE THIS LINE
...
```

```
$ grub-mkconfig -o /boot/grub/grub.cfg
```

TFTP

You have to update the destination folder in the `/etc/default/tftpd-hpa` configuration file as follows

```
# /etc/default/tftpd-hpa
TFTP_USERNAME="tftp"
TFTP_DIRECTORY="/var/lib/drlm/store"
TFTP_ADDRESS="0.0.0.0:69"
TFTP_OPTIONS="--secure"
```

NFS

We don't have to configure the `/etc/exports` file, the file is automatically maintained by DRLM.

DHCP

Same as `/etc/exports` file, configuration of `/etc/dhcp/dhcpd.conf` file is not required, the file is automatically maintained by DRLM.

HTTP

```
$ a2enmod ssl
$ a2enmod rewrite
$ a2enmod cgi
```

Edit `/etc/apache2/apache2.conf` file

```
# Include the DRLM Configuration:
Include /usr/share/drlm/conf/HTTP/https.conf
```

```
$ rm /etc/apache2/sites-enabled/*
```

Edit `/etc/apache2/ports.conf` file

```
#Listen 80
```

Restart & check services

```
$ systemctl restart tftpd-hpa.service
$ systemctl status tftpd-hpa.service

$ systemctl restart rpcbind.service
$ systemctl status rpcbind.service

$ systemctl restart apache2.service
$ systemctl status apache2.service
```

Note: DHCP and NFS servers are not running because there is no config yet! no worries they will be reloaded automatically after first DRLM client will be added.

3.2.2 Debian 7

Note: On the following steps, is assumed you have a minimal installation of Debian 7.

Install requirements

```
$ apt-get install openssh-client openssl netcat-traditional wget gzip tar gawk sed grep coreutils ut
```

Get DRLM

You can obtain the DRLM package building it from the source code or downloading from www.drlm.org website

Build DEB package from Source

```
$ aptitude install git build-essential debhelper
$ git clone https://github.com/brainupdaters/drlm
$ cd drlm
$ make deb
```

Download DEB package From DRLM Web

```
$ wget http://www.drlm.org/downloads/drlm_2.0.0_all.deb
```

Install DRLM package

The DEB package can be installed as follows (on Debian, Ubuntu)

Execute the next command:

```
$ dpkg -i drlm_2.0.0_all.deb
```

DRLM Components Configuration

This section covers configuration of:

- GRUB
- TFTP Service
- NFS Service
- DHCP Service
- HTTP Service

Configuring loop limits

The default configuration allows up to eight active loop devices. If more than eight file-based guests or loop devices are needed the number of loop devices configured can be adjusted adding the parameter *max_loop=1024* in the */etc/default/grub* file as follows:

```
...
GRUB_CMDLINE_LINUX="quiet max_loop=1024" ##UPDATE THIS LINE
...
```

```
$ grub-mkconfig -o /boot/grub/grub.cfg
```

TFTP

You have to update the destination folder in the */etc/default/tftpd-hpa* configuration file as follows

```
# /etc/default/tftpd-hpa
TFTP_USERNAME="tftp"
TFTP_DIRECTORY="/var/lib/drlm/store"
TFTP_ADDRESS="0.0.0.0:69"
TFTP_OPTIONS="--secure"
```

NFS

We don't have to configure the */etc/exports* file, the file is automatically maintained by DRLM.

DHCP

Same as */etc/exports* file, configuration of */etc/dhcp/dhcpd.conf* file is not required, the file is automatically maintained by DRLM.

HTTP

```
$ a2enmod ssl
$ a2enmod rewrite
$ a2enmod cgi
```

Edit */etc/apache2/apache2.conf* file

```
# Include the DRLM Configuration:
Include /usr/share/drlm/conf/HTTP/https.conf
```

```
$ rm /etc/apache2/sites-enabled/*
```

Edit /etc/apache2/ports.conf file

```
#NameVirtualHost *:80
#Listen 80
```

Restart & check services

```
$ service tfrpd-hpa restart
$ service tftpd-hpa status
in.tftpd is running.
$ service rpcbind restart
$ service rpcbind status
rpcbind is running.
$ service apache2 restart
$ service apache2 status
Apache2 is running (pid 2023).
```

Note: DHCP and NFS servers are not running because there is no config yet! no worries they will be reloaded automatically after first DRLM client will be added.

3.2.3 CentOS 7, Red Hat 7

Note: On the following steps, is assumed you have a minimal installation of CentOS 7.

Warning: selinux has been disabled

```
$ cat /etc/sysconfig/selinux

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of these two values:
#     targeted - Targeted processes are protected,
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

```
$ setenforce 0
```

Note: It is not a requirement to disable SELinux, but to work with DRLM Server must be properly configured. We have disabled this feature for easier installation.

Install requirements

```
$ yum -y install openssh-clients openssl nc wget gzip tar gawk sed grep coreutils util-linux rpcbind
```

Get DRLM

Build RPM package from Source

```
$ yum install git rpm-build
$ git clone https://github.com/brainupdaters/drlm
$ cd drlm
$ make rpm
```

Download RPM package From DRLM Web

```
$ wget http://www.drlm.org/downloads/drlm-2.0.0-1git.el6.noarch.rpm
```

Install DRLM package

The RPM package can be installed as follows (on Redhat, CentOS)

Execute the next command:

```
$ rpm -ivh drlm-2.0.0-1git.el7.centos.noarch.rpm
```

DRLM Components Configuration

This section covers configuration of:

- GRUB
- TFTP Service
- NFS Service
- DHCP Service
- HTTP Service

Configuring loop limits

The default configuration allows up to eight active loop devices. If more than eight file-based guests or loop devices are needed the number of loop devices configured can be adjusted adding the parameter *max_loop=1024* in the */etc/default/grub* file as follows:

```
...
GRUB_CMDLINE_LINUX="..... max_loop=1024" ##UPDATE THIS LINE ADDING MAX_LOOP=1024 PARAMETER
...
```

```
$ grub2-mkconfig -o /boot/grub2/grub.cfg
```

TFTP

You have to update the `/etc/xinetd.d/tftp` configuration file as follows:

```
service tftp
{
    socket_type = dgram
    protocol = udp
    wait = yes
    user = root
    server = /usr/sbin/in.tftpd
    server_args = -s /var/lib/drlm/store
    disable = no
    per_source = 11
    cps = 100 2
    flags = IPv4
}
```

NFS

We don't have to configure the `/etc/exports` file, the file is automatically maintained by DRLM.

DHCP

Same as `/etc/exports` file, configuration of `/etc/dhcp/dhcpd.conf` file is not required, the file is automatically maintained by DRLM.

HTTP

Disable the default Virtual Host and configure the server to work with SSL.

We have to edit `/etc/httpd/conf.d/ssl.conf`, comment or delete the Virtual host and include the DRLM http default configuration at the end of it.

```
Coment from here --->
##
## SSL Virtual Host Context
##
```

At the end of the file and insert:

```
# Include the DRLM Configuration:
Include /usr/share/drlm/conf/HTTP/https.conf
```

Then we have to coment the 80 port service commenting or deleting the next lines in `/etc/httpd/conf/httpd.conf` file.

```
#Listen 80

#ServerAdmin root@localhost

#DocumentRoot "/var/www/html"

#<Directory />
#     Options FollowSymLinks
#     AllowOverride None
```

```
#</Directory>

#<Directory "/var/www/html">
#     Options Indexes FollowSymLinks
#     AllowOverride None
#     Order allow,deny
#     Allow from all
#</Directory>

#ScriptAlias /cgi-bin/ "/var/www/cgi-bin/"

#<Directory "/var/www/cgi-bin">
#     AllowOverride None
#     Options None
#     Order allow,deny
#     Allow from all
#</Directory>
```

To finish we have to comment the `ErrorLog` and `CustomLog` lines in `/usr/share/drlm/conf/HTTP/https.conf` file.

```
#     ErrorLog ${APACHE_LOG_DIR}/error.log

#     CustomLog ${APACHE_LOG_DIR}/ssl_access.log combined
```

Restart & check services

```
$ systemctl enable xinetd.service
$ systemctl restart xinetd.service

$ systemctl enable rpcbind.service
$ systemctl restart rpcbind.service

$ systemctl enable httpd.service
$ systemctl restart httpd.service
```

Note: DHCP and NFS servers are not running because there is no config yet! no worries they will be reloaded automatically after first DRLM client will be added.

3.2.4 CentOS 6, Red Hat 6

Note: On the following steps, is assumed you have a minimal installation of CentOS 6 or Red Hat 6.

Warning: iptables and selinux has been disabled

```
$ cat /etc/sysconfig/selinux

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
```

```
#      disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of these two values:
#      targeted - Targeted processes are protected,
#      mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

```
$ setenforce 0
```

Note: It is not a requirement to disable SELinux and IPTABLES, but to work with DRLM Server must be properly configured. We have disabled these features for easier installation.

IPTABLES

```
$ chkconfig iptables off
$ service iptables stop
```

Install requirements

```
$ yum -y install openssh-clients openssl nc wget gzip tar gawk sed grep coreutils util-linux rpcbind
```

Get DRLM

Build RPM package from Source

```
$ yum install git rpm-build
$ git clone https://github.com/brainupdaters/drlm
$ cd drlm
$ make rpm
```

Download RPM package From DRLM Web

```
$ wget http://www.drlm.org/downloads/drlm-2.0.0-1git.el6.noarch.rpm
```

Install DRLM package

The RPM package can be installed as follows (on Redhat, CentOS)

Execute the next command:

```
$ rpm -ivh drlm-1.1.3-1git.el6.noarch.rpm
```

DRLM Components Configuration

This section covers configuration of:

- GRUB
- TFTP Service
- NFS Service
- DHCP Service

- HTTP Service

Configuring loop limits

The default configuration allows up to eight active loop devices. If more than eight clients are needed, the number of loop devices configured can be adjusted adding the parameter *max_loop=1024* in the */etc/grub.conf* file as follows:

```
title Red Hat Enterprise Linux (2.6.32-358.el6.x86_64)
root (hd0,0)
kernel /vmlinuz-2.6.32-358.el6.x86_64 ro root=/dev/mapper/vgroot-lvroot rd_NO_LUKS LANG=en_US.UTF-8
initrd /initramfs-2.6.32-358.el6.x86_64.img
```

TFTP

You have to update the */etc/xinetd.d/tftp* configuration file as follows:

```
service tftp
{
    socket_type = dgram
    protocol = udp
    wait = yes
    user = root
    server = /usr/sbin/in.tftpd
    server_args = -s /var/lib/drlm/store
    disable = no
    per_source = 11
    cps = 100 2
    flags = IPv4
}
```

NFS

We don't have to configure the */etc/exports* file, the file is automatically maintained by DRLM.

DHCP

Same as */etc/exports* file, configuration of */etc/dhcp/dhcpd.conf* file is not required, the file is automatically maintained by DRLM.

HTTP

Disable the default Virtual Host and configure the server to work with SSL.

We have to edit de */etc/httpd/conf.d/ssl.conf*, comment or delete the Virtual host and include the DRLM http default configuration at the end of it.

```
Coment from here --->
##
## SSL Virtual Host Context
##

At the end of the file and insert:
```

```
# Include the DRLM Configuration:
Include /usr/share/drlm/conf/HTTP/https.conf
```

Then we have to comment the 80 port service commenting or deleting the next lines in /etc/httpd/conf/httpd.conf file.

```
#Listen 80

#ServerAdmin root@localhost

#DocumentRoot "/var/www/html"

#<Directory />
#   Options FollowSymLinks
#   AllowOverride None
#</Directory>

#<Directory "/var/www/html">
#   Options Indexes FollowSymLinks
#   AllowOverride None
#   Order allow,deny
#   Allow from all
#</Directory>

#ScriptAlias /cgi-bin/ "/var/www/cgi-bin/"

#<Directory "/var/www/cgi-bin">
#   AllowOverride None
#   Options None
#   Order allow,deny
#   Allow from all
#</Directory>
```

To finish we have to comment the ErrorLog and CustomLog lines in /usr/share/drlm/conf/HTTP/https.conf file.

```
#   ErrorLog ${APACHE_LOG_DIR}/error.log

#   CustomLog ${APACHE_LOG_DIR}/ssl_access.log combined
```

Restart & check services

```
$ service xinetd restart
$ service xinetd status
xinetd (pid 5307) is running...
$ service rpcbind restart
$ service rpcbind status
rpcbind (pid 5097) is running...
$ service httpd restart
$ service httpd status
httpd (pid 5413) is running...
```

Note: DHCP and NFS servers are not running because there is no config yet! no worries they will be reloaded automatically after first DRLM client will be added.

3.3 DRLM Client Installation

3.3.1 Unattended Installation

Now ReaR can be installed and configured on a remote server from the DRLM server using the new feature **drlm instclient**

Let's explain a little bit the steps the new feature does:

- Create the drlm user
- Install rear dependencies
- Install rear package
- Configure ReaR to be managed by DRLM
- Configure sudo for drlm user.
- Start and configure required services

Supported OS's on the new feature instclient

Install Client feature has been tested on:

- Suse 12 SP1
- RedHat 6,7
- CentOS 6,7
- Debian 7,8

Note: It should work on Redhat & CentOS 5 and also on Debian 6.

Requirements

In order to install ReaR from DRLM server the client must have:

- Access to EPEL Repo to install rear from repo (CentOS,RedHat)
- instclient uses apt-get, yum and zypper, so repositories must be configured
- SSH enabled
- root user or user with administrator privileges to install ,start services like rpcbind and configure applications ReaR,DHCP,sudo.

Run unattended install

To perform an unattended install of a DRLM client, just is needed to run **instclient** DRLM command like one of the following examples:

Warning: The client must be properly registered in DRLM with **addclient** command.

Examples:

```
$ drlm instclient -c ReaRCli1  
$ drlm instclient -c ReaRCli1 -U http://download.opensuse.org/repositories/Archiving:/Backup:/Rear/D
```

Note: See Client Operations for more information

3.3.2 Manual Installation

3.3.3 Debian 7

ReaR requirements for DRLM

As rear is written in bash you need bash as a bare minimum. Other requirements are:

- syslinux (for i386 based systems)
- ethtool
- genisoimage
- parted
- gawk
- attr
- sudo
- curl (rear need to get its configuration from DRLM server)
- minigetty (rear is depending on it in recovery mode)

```
$ apt-get install syslinux ethtool genisoimage parted gawk attr sudo curl minigetty
```

Download and install ReaR

Note: Minimum version required of ReaR: 1.17.0

Download ReaR

```
$ wget http://download.opensuse.org/repositories/Archiving:/Backup:/Rear/Debian_7.0/all/rear_1.17.2_
```

You can download other ReaR versions from [ReaR Download Page](http://relax-and-recover.org/download/)⁷ or from [OpenSuse Build Service](https://build.opensuse.org/project/show/Archiving:Backup:Rear)⁸.

Install ReaR package

The DEB based package can be installed as follows

Execute the next command:

```
$ dpkg -i rear_1.17.2_all.deb
```

⁷ <http://relax-and-recover.org/download/>

⁸ <https://build.opensuse.org/project/show/Archiving:Backup:Rear>

Note: For more information about ReaR visit: <http://relax-and-recover.org/documentation>

Create DRLM User

```
$ useradd -d /home/drlm -c "DRLM User Agent" -m -s /bin/bash -p $(echo S3cret | openssl passwd -1 -st)
```

Disable password aging for drlm user

```
$ chage -I -1 -m 0 -M 99999 -E -1 drlm
```

Copy rsa key from DRLM Server to the new client

Warning: You have to execute this code from DRLM Server. The password which you will be asked for is “S3cret” and “client_ipaddr” must be changed to the client ip address.

```
$ ssh-keygen -t rsa
$ ssh-copy-id drlm@"client_ipaddr"
```

Disable password login

```
$ passwd -l drlm
```

Add Sudo roles for DRLM user

Edit `/etc/sudoers.d/drlm` and add the following lines

```
Cmnd_Alias DRLM = /usr/sbin/rear, /bin/mount, /sbin/vgs
drlm    ALL=(root)    NOPASSWD: DRLM
```

Change `/etc/sudoers.d/drlm` permissions

```
$ chmod 440 /etc/sudoers.d/drlm
```

Client configuration

We have to specify that this ReaR client is managed from a DRLM server. We have to edit the `/etc/rear/local.conf` and insert the next line.

```
DRLM_MANAGED=y
```

Add client config file at DRLM server

Warning: You have to do this at DRLM Server.

We have to add a new file called as “client host name”.cfg at /etc/drlm/clients/ For example: If our client host name is ReaRcli1 we have to create /etc/drlm/clients/ReaRcli1.cfg and add the following lines. Where CLI_NAME=“Client Host Name” and SRV_NET_IP=“DRLM Server IP”.

```
CLI_NAME=ReaRcli1
SRV_NET_IP=192.168.1.38

OUTPUT=PXE
OUTPUT_PREFIX=$OUTPUT
OUTPUT_PREFIX_PXE=$CLI_NAME/$OUTPUT
OUTPUT_URL=nfs://${SRV_NET_IP}/var/lib/drlm/store/${CLI_NAME}

BACKUP=NETFS
NETFS_PREFIX=BKP
BACKUP_URL=nfs://${SRV_NET_IP}/var/lib/drlm/store/${CLI_NAME}

SSH_ROOT_PASSWORD=drlm
```

Warning: This file must be readable by Apache

```
$ chmod 644 /etc/drlm/clients/ReaRcli1.cfg
```

3.3.4 CentOS 6, Red Hat 6

ReaR requirements for DRLM

As rear is written in bash you need bash as a bare minimum. Other requirements are:

- mkisofs
- mingetty (rear depends on it in recovery mode)
- syslinux (for i386 based systems)
- nfs-utils
- cifs-utils
- rpcbind
- wget
- sudo
- curl (rear needs it to get configuration from DRLM server)

```
$ yum -y install mkisofs mingetty syslinux nfs-utils cifs-utils rpcbind wget curl sudo
```

Download and install ReaR

Note: Minimum version required of ReaR: 1.17.0

Download ReaR

```
$ DISTRO="CentOS_CentOS-6" or DISTRO="RedHat_RHEL-6"
$ wget http://download.opensuse.org/repositories/Archiving:/Backup:/Rear/$DISTRO/$(uname -m)/rear-1.17.2-1.el6.x86_64.rpm
```

You can download other ReaR versions from [ReaR Download Page](http://relax-and-recover.org/download/)⁹ or from [OpenSuse Build Service](https://build.opensuse.org/project/show/Archiving:Backup:Rear)¹⁰.

Install ReaR package

The RPM based package can be installed as follows

Execute the next command:

```
$ yum install rear-1.17.2-1.el6.x86_64.rpm
```

Note: For more information about ReaR visit: <http://relax-and-recover.org/documentation>

Create DRLM User

```
$ useradd -d /home/drlm -c "DRLM User Agent" -m -s /bin/bash -p $(echo S3cret | openssl passwd -1 -st)
```

Disable password aging for drlm user

```
$ chage -I -1 -m 0 -M 99999 -E -1 drlm
```

Copy rsa key from DRLM Server to the new client

Warning: You have to execute this code from DRLM Server. The password which you will be asked for is “S3cret” and “client_ipaddr” must be changed to the client ip address.

```
$ ssh-keygen -t rsa
$ ssh-copy-id drlm@"client_ipaddr"
```

Disable password login

```
$ passwd -l drlm
```

Add Sudo roles to DRLM user

Edit `/etc/sudoers.d/drlm` and add the following lines

```
Cmnd_Alias DRLM = /usr/sbin/rear, /bin/mount, /sbin/vgs
drlm ALL=(root) NOPASSWD: DRLM
```

Change `/etc/sudoers.d/drlm` permissions

⁹ <http://relax-and-recover.org/download/>

¹⁰ <https://build.opensuse.org/project/show/Archiving:Backup:Rear>

```
$ chmod 440 /etc/sudoers.d/drlm
```

Client configuration

We have to specify that this ReaR client is managed from a DRLM server. We have to edit the `/etc/rear/local.conf` and insert the next line.

```
DRLM_MANAGED=y
```

Services

rpcbind

```
$ service rpcbind start
$ chkconfig rpcbind on
```

nfs

```
$ service nfs start
$ chkconfig nfs on
```

Add client config file at DRLM SERVER

Warning: You have to do this at DRLM Server.

We have to add a new file called as “client host name”.cfg at `/etc/drlm/clients/`. For example: If our client host name is `ReaRcli1` we have to create `/etc/drlm/clients/ReaRcli1.cfg` and add the following lines. Where `CLI_NAME=“Client Host Name”` and `SRV_NET_IP=“DRLM Server IP”`.

```
CLI_NAME=ReaRcli1
SRV_NET_IP=192.168.1.38

OUTPUT=PXIE
OUTPUT_PREFIX=$OUTPUT
OUTPUT_PREFIX_PXE=$CLI_NAME/$OUTPUT
OUTPUT_URL=nfs://${SRV_NET_IP}/var/lib/drlm/store/${CLI_NAME}

BACKUP=NETFS
NETFS_PREFIX=BKP
BACKUP_URL=nfs://${SRV_NET_IP}/var/lib/drlm/store/${CLI_NAME}

SSH_ROOT_PASSWORD=drlm
```

Warning: This file must be readable by Apache

```
$ chmod 644 /etc/drlm/clients/ReaRcli1.cfg
```

3.4 DRLM Client Recover

In this section we show how to recover a system which has been backed up.

In this example your client and server has the following configuration. You have to adapt it to your case.

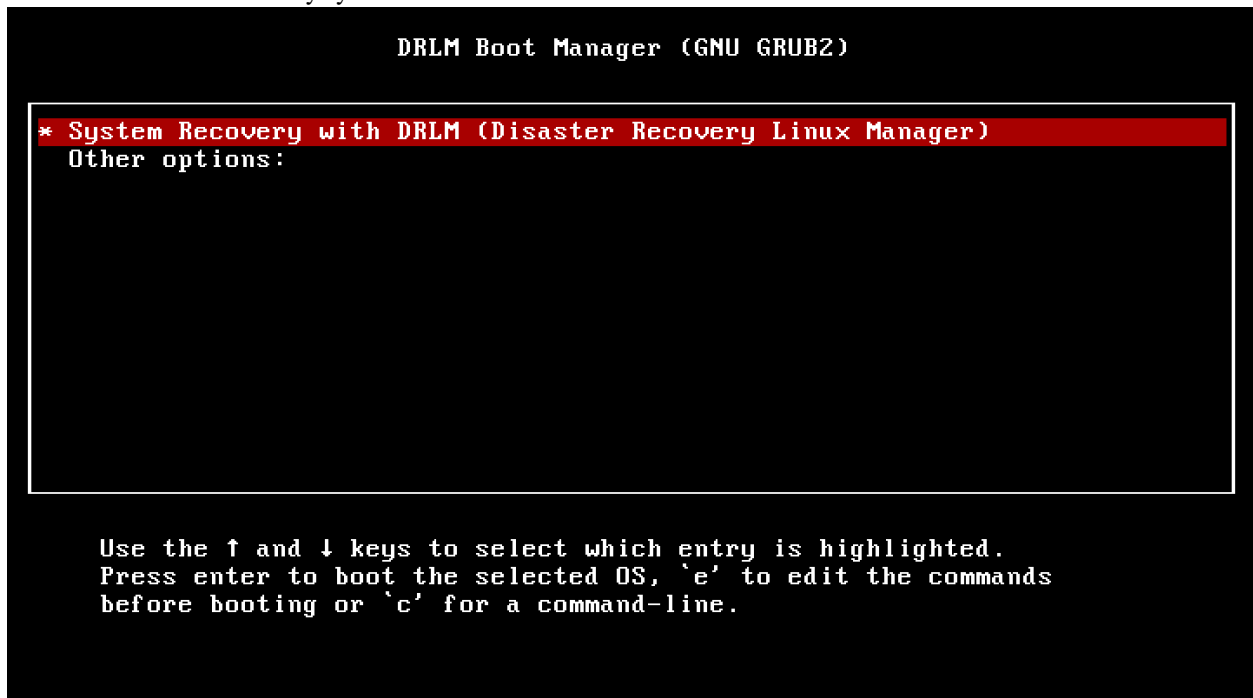
```
DRLM Server Host Name: DRLMsrv
DRLM Server IP: 192.168.2.120

ReaR Client Host Name: fosdemcli4
ReaR Client IP: 192.168.2.102
```

3.4.1 Step by Step Client Recover

Reboot the Client and select boot from network. Automaticaly will boot from PXE.

1. The DRLM server gives us through PXE/TFTP the client boot system. We just have to select first menu option to enter in the recovery system.



2. Once we have the system ready Login as “root”. No password required.

```

Running 42-engage-scsi.sh...
Running 45-serial-console.sh...
Running 55-migrate-network-devices.sh...
Running 58-start-dhclient.sh...
Attempting to start the DHCP client daemon
Running 60-network-devices.sh...
Running 62-routing.sh...
Running 99-makedev.sh...
* * * Rescue System is ready * * *
INIT: Entering runlevel: 3

Relax-and-Recover 1.17.2 / Git

Relax-and-Recover comes with ABSOLUTELY NO WARRANTY; for details see
the GNU General Public License at: http://www.gnu.org/licenses/gpl.html

Host fosdemcli4 using Backup NETFS and Output PXE
Build date: Sun, 31 Jan 2016 15:24:28 +0100

Debian GNU/Linux 7 fosdemcli4 tty1
fosdemcli4 login: root_

```

3. We indicate that we want to recover the system with the command “rear recover” and the following variables SERVER=”DRLM Server Ip” REST_OPTS=-k ID=”Rear Client Host Name”, in our case “rear recover SERVER=192.168.2.120 REST_OPTS=-k ID=fosdemcli4”

```

Running 60-network-devices.sh...
Running 62-routing.sh...
Running 99-makedev.sh...
* * * Rescue System is ready * * *
INIT: Entering runlevel: 3

Relax-and-Recover 1.17.2 / Git

Relax-and-Recover comes with ABSOLUTELY NO WARRANTY; for details see
the GNU General Public License at: http://www.gnu.org/licenses/gpl.html

Host fosdemcli4 using Backup NETFS and Output PXE
Build date: Sun, 31 Jan 2016 15:24:28 +0100

Debian GNU/Linux 7 fosdemcli4 tty1
fosdemcli4 login: root

Welcome to Relax and Recover. Run "rear recover" to restore your system !

RESCUE fosdemcli4:~ # rear recover SERVER=192.168.2.120 REST_OPTS=-k ID=fosdemcli4_

```

4. The system is recovering.

```

Debian GNU/Linux 7 fosdemcli4 tty1
fosdemcli4 login: root

Welcome to Relax and Recover. Run "rear recover" to restore your system !

RESCUE fosdemcli4:~ # rear recover SERVER=192.168.2.120 REST_OPTS=-k ID=fosdemcli4
Relax-and-Recover 1.17.2 / Git
Using log file: /var/log/rear/rear-fosdemcli4.log
Calculating backup archive size
Backup archive size is 332M      /tmp/rear.c7HvG81lh5Xu4EO/outputfs/BKP/backup.tar.gz (compressed)
Comparing disks.
Disk configuration is identical, proceeding with restore.
Start system layout restoration.
Creating partitions for disk /dev/sda (msdos)
Creating ext4-filesystem / on /dev/sda1
Mounting filesystem /
Creating swap on /dev/sda5
Disk layout created.
Decrypting disabled
Restoring from '/tmp/rear.c7HvG81lh5Xu4EO/outputfs/BKP/backup.tar.gz'
Restored 305 MiB [avg 20861 KiB/sec]_

```

5. System recovered! So we only have to restart the client.

```

RESCUE fosdemcli4:~ # rear recover SERVER=192.168.2.120 REST_OPTS=-k ID=fosdemcli4
Relax-and-Recover 1.17.2 / Git
Using log file: /var/log/rear/rear-fosdemcli4.log
Calculating backup archive size
Backup archive size is 332M      /tmp/rear.c7HvG81lh5Xu4EO/outputfs/BKP/backup.tar.gz (compressed)
Comparing disks.
Disk configuration is identical, proceeding with restore.
Start system layout restoration.
Creating partitions for disk /dev/sda (msdos)
Creating ext4-filesystem / on /dev/sda1
Mounting filesystem /
Creating swap on /dev/sda5
Disk layout created.
Decrypting disabled
Restoring from '/tmp/rear.c7HvG81lh5Xu4EO/outputfs/BKP/backup.tar.gz'
Restored 873 MiB [avg 21305 KiB/sec]OK
Restored 873 MiB in 43 seconds [avg 20810 KiB/sec]
Installing GRUB2 boot loader
Installation finished. No error reported.

Finished recovering your system. You can explore it under '/mnt/local'.

RESCUE fosdemcli4:~ # _

```

3.5 Error Reporting Configuration

DRLM can be configured to report errors on scheduled backups if required. Is possible to report by mail or integrating with your monitoring service. At this time (DRLM 2.0) we support error reporting by mail and integration with Nagios, Zabbix and HPOM(OVO) monitoring services.

Note: All reporting configuration samples are located in: `/usr/share/drlm/conf/samples`

3.5.1 Enable DRLM reporting

```
$ vi /etc/drlm/local.conf

#####
#
# Defines HowTo report Errors using some known and wide used methods
#
#   ERR_REPORT=[yes|no]
#   default: no
#   REPORT_TYPE=[ovo|nagios|zabbix|mail|...]
#   default: empty
#
#####

ERR_REPORT=yes
REPORT_TYPE=<type>
```

3.5.2 Configure Nagios reporting

In order to configure Nagios Error reporting on DRLM, the Nagios NSCA Client must be installed.

Debian 7/8

```
$ apt-get install nsca-client
```

RHEL/Centos 6/7

```
$ yum install nsca-client
```

Warning: May be needed to add EPEL repositories if not present, because those packages are not included in distribution repositories.

The following options are DRLM defaults, change any of them to your installation requirements in `/etc/drlm/local.conf`.

```
$ vi /etc/drlm/local.conf

#
# REPORT_TYPE=nagios
# NAGIOS VARIABLES
#
# These are default values and can be overwritten in local.conf according to your NAGIOS installation
#

NAGCMD="/usr/sbin/send_nsca"
NAGSVC="DRLM"
NAGHOST="$HOSTNAME"
NAGCONF="/etc/drlm/alerts/nagios.cfg"
```

nagios_sample.cfg

Copy the sample DRLM configuration for Nagios to previously defined \$NAGCONF and adjust it to your environment needs.

```
#### DRLM (Disaster Recovery Linux Manager) Nagios error reporting sample configuration file.
#### Default: /etc/drlm/alerts/nagios.cfg

### identity = <string>
#   Send the specified client identity to the server.
#   By default, localhost will be used.

#identity = "drlm_server_hostname"

### server = <string>
#   Connect and talk to the specified server address or hostname.
#   The default server is "localhost".

#server = "monitoring_server"

### port = <string>
#   Connect to the specified service name or port number on the
#   server instead of using the default port (5668).

#port = 5667
```

Note: The configuration on the server side is not in the scope of this documentation. Please check your Nagios service documentation to configure properly the NSCA service and how to report DRLM alerts.

For reference you can check:

- https://assets.nagios.com/downloads/nagioscore/docs/Installing_NSCA.pdf
- http://nagios.sourceforge.net/download/contrib/documentation/misc/NSCA_Setup.pdf
- <https://assets.nagios.com/downloads/nagiosxi/docs/Using-and-Configuring-NSCA-With-Nagios-XI.pdf>

3.5.3 Configure Zabbix reporting

In order to configure Zabbix Error reporting on DRLM, the Zabbix Agent must be installed.

Debian 7/8

```
$ apt-get install zabbix-agent
```

Warning: On debian 7 (wheezy) the backports repository must be configured in order to install zabbix-agent.

RHEL/Centos 6/7

```
$ yum install zabbix-agent
```

Warning: May be needed to add EPEL repositories if not present, because those packages are not included in distribution repositories.

The following options are DRLM defaults, change any of them to your installation requirements in /etc/drlm/local.conf.

```
$ vi /etc/drlm/local.conf

#
# REPORT_TYPE=zabbix
# ZABBIX VARIABLES
#
# These are default values and can be overwritten in local.conf according to your ZABBIX installation
#

ZABBCMD="/usr/bin/zabbix_sender"
ZABBKEY="DRLM"
ZABBCONF="/etc/drlm/alerts/zabbix.cfg"
```

zabbix_sample.cfg

Copy the sample DRLM configuration for Zabbix to previously defined \$ZABBCONF and adjust it to your environment needs.

```
##### DRLM (Disaster Recovery Linux Manager) Zabbix error reporting sample configuration file.
##### Default: /etc/drlm/alerts/zabbix.cfg

### Option: ServerActive
#     List of comma delimited IP:port (or hostname:port) pairs of Zabbix servers for active checks.
#     If port is not specified, default port is used.

#ServerActive=monitoring_server:port,monitoring_proxy:port

### Option: Hostname
#     Unique, case sensitive hostname.
#     Required for active checks and must match hostname as configured on the server.

#Hostname=drlm_server_hostname
```

Note: The configuration on the server side is not in the scope of this documentation. Please check your Zabbix service documentation to configure properly the Trapper item and how to report DRLM alerts.

For reference you can check:

- <https://www.zabbix.com/documentation/3.2/manual/config/items/itemtypes/trapper>
 - https://www.zabbix.com/documentation/3.2/manpages/zabbix_sender
-

3.5.4 Configure Mail reporting

In order to configure Zabbix Error reporting on DRLM, the Heirloom Mailx must be installed.

Debian 7/8

```
$ apt-get install heirloom-mailx
```

RHEL/Centos 6/7

```
$ yum install mailx
```

The following options are DRLM defaults, change any of them to your installation requirements in /etc/drlm/local.conf.

```
$ vi /etc/drlm/local.conf

#
# REPORT_TYPE=mail
# MAIL VARIABLES
#
# These are default values and can be overwritten in local.conf according to your MAIL installation
#

MAILCMD="/bin/mailx"
MAILSUBJECT="DRLM ERROR ALERT ($HOSTNAME)"
MAILCONF="/etc/drlm/alerts/mail.cfg"
MAIL_TO="root@localhost"
MAIL_CC=""
MAIL_BCC=""
```

mail_sample.cfg

Copy the sample DRLM configuration for Mailx to previously defined \$MAILCONF and adjust it to your environment needs.

```
##### DRLM (Disaster Recovery Linux Manager) Mail error reporting sample configuration file.
##### Default: /etc/drlm/alerts/mail.cfg

### Configure MAIL_FROM [ address(friendly_name) ].

#set from="john@doe.org(John Doe) "

### Set SMTP server configuration [ ipaddr_or_dnsname:port ].

#set smtp=smtp_server:25

### Set SMTP server Auth Options [ Username (mail address) and Password ] if required.

#set smtp-auth=login
#set smtp-auth-user=john@doe.org
#set smtp-auth-password=SoMePaSsWoRd

#####
##### Example using external Gmail smtp servers:

#set from="john@doe.org(John Doe) "
#set smtp-use-starttls
#set ssl-verify=ignore
#set smtp-auth=login
#set smtps=smtp://smtp.gmail.com:587
#set smtp-auth-user=some_user@gmail.com
#set smtp-auth-password=pAsSwOrD
#set nss-config-dir=/etc/ssl/certs
```

Note: The configuration on the Mail server is not in the scope of this documentation. Please check your Mail service configuration to configure properly mailx to report DRLM alerts.

3.5.5 Configure HPOM (former OVO) reporting

In order to configure HPOM(OVO) Error reporting on DRLM, the HPOM(OVO) agent must be installed. This may vary depending on your version, please check your product documentation in order to install it properly. DRLM uses **opcmsg** binary to report errors to HPOM server.

The following options are DRLM defaults, change any of them according to your installation requirements in `/etc/drlm/local.conf`.

```
$ vi /etc/drlm/local.conf:

#
# REPORT_TYPE=ovo
# HP OVO VARIABLES
#
# These are default values and can be overwritten in local.conf according to your HP OVO installation
#

OVOCMD="/opt/OV/bin/OpC/opcmsg"
OVOAPP="DRLM"
OVOSEV="Major"
OVOOBJ="OS"
OVOMSGGRP="LINUX"
```

Note: The configuration on the server side is not in the scope of this documentation. Please check HPOM (OVO) documentation to configure properly the server side and define how to report DRLM alerts.

3.6 Network Operations

DRLM can make backups of clients in different networks. So the first step we have to do for the proper functioning of DRLM is register the networks in which later we will register the clients.

DRLM network operations allow us to add, remove, modify and list network of database.

3.6.1 Add Network

This command is used to add networks to DRLM database. It is called like this:

```
$ drlm addnetwork [options]
```

The **drilm addnetwork** has some required options:

- n network_name, --netname network_name**
Select Network name to add.
- i ip, --ipaddr ip**
Network IP address.
- g gateway_ip, --gateway gateway_ip**
Network gateway address.
- m network_mask, --mask network_mask**
Network mask

-s server_ip, **--server** server_ip
Network server address.

Examples:

```
$ drlm addnetwork -i 13.74.90.0 -g 13.74.90.1 -m 255.255.255.0 -s 13.74.90.222 -n vlan12
$ drlm addnetwork -i 13.74.90.0 --gateway 13.74.90.1 --mask 255.255.255.0 --server 13.74.90.222
$ drlm addnetwork --ipaddr 13.74.90.0 -g 13.74.90.1 -m 255.255.255.0 --server 13.74.90.222 -n v
```

Optional options:

-h, --help
Show drlm addnetwork help.

Examples:

```
$ drlm addnetwork -h
$ drlm addnetwork --help
```

3.6.2 Delete Network

This command is used to delete networks from DRLM database. It is called like this:

```
$ drlm delnetwork [options]
```

The **drlm delnetwork** has some options:

-n network_name, **--netname** network_name
Select Network to delete by NAME.

Examples:

```
$ drlm delnetwork -n vlan12
$ drlm delnetwork -name vlan12
```

-I network_id, **--id** network_id
Select Network to delete by ID.

Examples:

```
$ drlm delnetwork -I 12
$ drlm delnetwork --id 12
```

Optional options:

-h, --help
Show drlm delnetwork help.

Examples:

```
$ drlm delnetwork -h
$ drlm delnetwork --help
```

3.6.3 Modify Network

This command is used to modify networks from DRLM database. It is called like this:

```
$ drlm modnetwork [options]
```

The **drlm modnetwork** has some required options:

-n network_name, --netname network_name
Select Network to change by NAME.

-I network_id, --id network_id
Select Network to change by ID.

Optional options:

-i ip, --ipaddr ip
Set new IP address to network.

Examples:

```
$ drlm modnetwork -I 12 -i 13.74.91.0
$ drlm modnetwork --id 12 --ipaddr 13.74.91.0
$ drlm modnetwork -n vlan12 -i 13.74.91.0
$ drlm modnetwork --netname vlan12 --ipaddr 13.74.91.0
```

-g gateway_ip, --gateway gateway_ip
Set new GATEWAY address to network.

Examples:

```
$ drlm modnetwork -I 12 -g 13.74.91.1
$ drlm modnetwork --id 12 --gateway 13.74.91.1
$ drlm modnetwork -n vlan12 -g 13.74.91.1
$ drlm modnetwork --netname vlan12 --gateway 13.74.91.1
```

-m network_mask, --mask network_mask
Assign new MASK to network.

Examples:

```
$ drlm modnetwork -I 12 -m 255.255.0.0
$ drlm modnetwork --id 12 -m 255.255.0.0
$ drlm modnetwork -n vlan12 -m 255.255.0.0
$ drlm modnetwork --netname vlan12 --mask 255.255.0.0
```

-s server_ip, --server server_ip
Assign new SERVER to network.

Examples:

```
$ drlm modnetwork -I 12 -s 13.74.91.221
$ drlm modnetwork --id 12 --server 13.74.91.221
$ drlm modnetwork -n vlan12 -s 13.74.91.221
$ drlm modnetwork --netname vlan12 --server 13.74.91.221
```

-h, --help
Show drlm modnetwork help.

Examples:

```
$ drlm modnetwork -h
$ drlm modnetwork --help
```

3.6.4 List Networks

This command is used to list the networks from DRLM database. It is called like this:

```
$ drlm listnetwork [options]
```

The **drmlm listnetwork** has some options:

-n network_name, --netname network_name
Select Network to list.

Exmples:

```
$ drlm listnetwork -n vlan12
$ drlm listnetwork --netname vlan12
```

-A, --all
List all networks.

Examples:

```
$ drlm listnetwork -A
$ drlm listnetwork -all
```

-h, --help
Show drlm listnetwork help.

Examples:

```
$ drlm listnetwork -h
$ drlm listnetwork --help
```

3.7 Client Operations

DRLM client operations allow us to add, remove, modify and list clients of database.

3.7.1 Add Client

This command is used to add clients to DRLM database. It is called like this:

```
$ drlm addclient [options]
```

The **drmlm addclient** has some requiered options:

-c client_name, --client client_name
Select Client name to add.

-i ip, --ipaddr ip
Client IP address.

-M mac_address, --macaddr mac_address
Client MAC address.

-n network_name, --netname network_name
Client NETWORK.

Examples:

```
$ drlm addclient -c clientHost1 -M 00-40-77-DB-33-38 -i 13.74.90.10 -n vlan12
$ drlm addclient --client clientHost1 --macaddr 00-40-77-DB-33-38 -i 13.74.90.10 -n vlan12
```

Warning: If the network_name doesn't exist in DRLM database you will get an error. First of all register de network where the client will be registered.

Warning: We have to manually add to the client configuration file in the DRLM server called /etc/drlm/clients/client_name.cfg with the next content:

```
OUTPUT=PXE      OUTPUT_PREFIX=PXE      BACKUP=NETFS      NETFS_PREFIX=BKP
BACKUP_URL=nfs://SERVER_IP/DRLM/STORE/client_name OUTPUT_URL=nfs://SERVER_IP/DRLM/STORE/client_name
OUTPUT_PREFIX_PXE=client_name/$OUTPUT_PREFIX
```

You have to replace the SERVER_IP for the IP of the DRLM server and the client_name for the client host name.

Optional options:

-h, --help

Show drlm addclient help.

Examples:

```
$ drlm addclient -h
$ drlm addclient --help
```

3.7.2 Install Client

This command is used to install and configure DRLM and ReaR on a remote Server. It is called like this:

```
$ drlm instclient [options]
```

The **drlm instclient** has some requiered options:

-c client_name, --client client_name

Select Client name to add.

-I client_id, --id client_id

Client Id.

Note: Since Debian don't have the ReaR package on his repositories the following option is a requeriment also

-U|--url_rear <URL_REAR>

Optional options:

-u user, --user user

User with admin privileges to install and configure software

-d drlm_user, --drlm_user drlm_user

Force drlm_user name , default is drlm

Note: if not user is specified root will be used.

-U url_rear, --url_rear url_rear

rpm or deb package for especific distro for example http://download.opensuse.org/repositories/Archiving:/Backup:/Rear/Debian_7

-h, --help

Show drlm instclient help.

Examples:


```
$ drlm instclient -h
$ drlm instclient -c ReaRCli1 -u admin -U http://download.opensuse.org/repositories/Archiving:/B
$ drlm instclient -c ReaRCli2
```

3.7.3 Delete Client

This command is used to delete clients from DRLM database. It is called like this:

```
$ drlm delclient [options]
```

The **drlm delclient** has some required options:

- c client_name, --client client_name**
Select Client to delete by NAME.
- I client_id, --id client_id**
Select Client to delete by ID.

Examples:

```
$ drlm delclient -c clientHost1
$ drlm delclient --client clientHost1
$ drlm delclient -I 12
$ drlm delclient --id 12
```

Optional options:

- h, --help**
Show drlm delclient help.

Examples:

```
$ drlm delclient -h
$ drlm delclient --help
```

3.7.4 Modify Client

This command is used to modify clients from DRLM database. It is called like this:

```
$ drlm modclient [options]
```

The **drlm modclient** has some required options:

- c client_name, --client client_name**
Select Client to change by NAME
- I client_id, --id client_id**
Select Client to change by ID

Optional options:

- i ip, --ipaddr ip**
Set new IP address to client.

Examples:

```
$ drlm modclient -c clientHost1 -i 13.74.90.10
```

-M *mac_address*, **--macaddr** *mac_address*
Set new MAC address to client.

Examples:

```
$ drlm modclient -c clientHost1 -M 00-40-77-DB-33-38
$ drlm modclient --client clientHost1 --macaddr 00-40-77-DB-33-38
$ drlm modclient -I 12 --macaddr 00-40-77-DB-33-38
$ drlm modclient --id 12 -M 00-40-77-DB-33-38
```

-n *network_name*, **--netname** *network_name*
Assign new NETWORK to client.

Examples:

```
$ drlm modclient -c clientHost1 -n vlan12
$ drlm modclient --client clientHost1 --netname vlan12
$ drlm modclient -I 12 --netname vlan12
$ drlm modclient --id 12 -n vlan12
```

-h, **--help**
Show drlm modclient help.

Examples:

```
$ drlm modclient -h
$ drlm modclient --help
```

3.7.5 List Clients

This command is used to list the clients stored at the database. It is called like this:

```
$ drlm listclient [options]
```

The **drlm listclient** has some options:

-c *client_name*, **--client** *client_name*
Select Client to list.

Examples:

```
$ drlm listclient -c clientHost1
$ drlm listclient --client clientHost1
```

-A, **--all**
List all clients.

Examples:

```
$ drlm listclient -A
$ drlm listclient --all
```

-h, **--help**
Show drlm listclient help.

Examples:

```
$ drlm listclient -h
$ drlm listclient --help
```

3.8 Backup Operations

DRLM backup operations allow us to remotely create new backups of clients, enable and disable restore points and make listings of backups created among other things.

3.8.1 Run Backup

This command is used to Run remote client backup from DRLM. It is called like this:

```
$ drlm runbackup [options]
```

The **drlm runbackup** has several options:

-c client_name, --client client_name
Select Client to remotely run backup by name.

Examples:

```
$ drlm runbackup -c clientHost1
$ drlm runbackup --client clientHost1
```

-I client_id, --id client_id
Select Client to remotely run backup by ID.

Examples:

```
$ drlm runbackup -I 12
$ drlm runbackup -id 12
```

-h, --help
Show drlm runbackup help.

Examples:

```
$drlm runbackup -h
$drlm runbackup --help
```

3.8.2 Delete Backup

This command is used to delete backups from DRLM database. It is called like this:

```
$ drlm delbackup [options]
```

The **drlm delbackup** has some requiered options:

-c client_name, --client client_name
Select Client to delete the backup.

-I backup_id, --id backup_id
Select Backup to delete by ID.

-A, --all
Delete All backup.

Examples:

```
$ drlm delbackup -c clientHost1 -I 2015030121245
$ drlm delbackup --client clientHost1 --id 2015030121245
$ drlm delbackup -c clientHost1 -A
$ drlm delbackup --client clientHost1 --all
```

Optional options:

-h, --help

Show drlm delbackup help.

Examples:

```
$ drlm delbackup -h
$ drlm delbackup --help
```

3.8.3 Backup Manager

This command is used to enable or disable clients restore points. Is also used to put a restore point by default. It is called like this:

```
$ drlm bkpmgr [options]
```

The **drlm bkpmgr** has some required options:

-c client_name, --client client_name
Select Client name to modify backup

-I backup_id, --id backup_id
Select Backup ID to modify

-e, --enable
Enable Backup

-d, --disable
Disable Backup

Examples:

```
$drlm bkpmgr -c clientHost1 -I 20140519065512 -e
$drlm bkpmgr --client clientHost1 -I 20140519065512 -d
$drlm bkpmgr -c clientHost1 --id 20140519065512 -e
```

Additional options:

-P

Set backup to persistent mode. The persistent mode is used to indicate what backup will be activated by default in case of service restarting. A backup stops to be in persistent mode and it is replaced when creating a new one backup for the same client.

Examples:

```
$drlm bkmgr -c clientHost1 - I 20140519065512 -e -P
```

-h, --help

Show drlm bkmgr help.

Examples:

```
$ drlm bkmgr -h
$ drlm bkmgr --help
```

3.8.4 List Backups

This command is used to list the backups that we have stored on the server. It is called like this:

```
$ drlm listbackup [options]
```

The **drmlm listbackup** has some options:

-c client_name, **--client** client_name
Select Client to list its backups.

Examples:

```
$ drlm listbackup -c clientHost1
$ drlm listbackup --client clientHost1
```

-A, --all
List all backups

Examples:

```
$ drlm listbackup -A
$ drlm listbackup --all
```

-h, -help
Show this help

Examples:

```
$ drlm listbackup -h
$ drlm listbackup --help
```

3.9 Building GRUB2 for diferent platfoms

Since DRLM version 2, we moved to GRUB2 to provide the netboot images to start ReaR recovery images from network. This movement was the first step to provide support for mulitple platforms for GNU/Linux because GRUB2 supports multiple architerctures.

At this time DRLM built packages include all documented platforms in this guide.

3.9.1 Prepare your build host

Note: This document describes the process of building DRLM GRUB2 netboot images for diferent platforms with a debian machine. The process should be the same on other distros, just adjusting package dependencies for target distro and install them with the package management tools provided by each distro should work without problems.

Install required packages

```
$ apt-get install bison libopts25 libselineux1-dev autogen \
m4 autoconf help2man libopts25-dev flex libfont-freetype-perl \
automake autotools-dev libfreetype6-dev texinfo
```

Download GRUB2 sources

```
$ cd /usr/src
$ wget http://alpha.gnu.org/gnu/grub/grub-2.02~beta3.tar.gz
$ tar -xzvf grub-2.02~beta3.tar.gz
$ cd grub-2.02~beta3
```

3.9.2 Start build process

Warning: All documented grub2 image builds are included in drlm packages, this document will be a kind of guide for troubleshooting and testing on new GRUB2 versions and also a guide to, contributors of future drlm grub2 images, on new supported platforms to the project.

Provide DRLM branded GRUB2 build

```
$ vi grub-core/normal/main.c

.. replace:
msg_formatted = grub_xasprintf (_("GNU GRUB  version %s"), PACKAGE_VERSION);

.. with:
msg_formatted = grub_xasprintf (_("DRLM Boot Manager (GNU GRUB2)"), PACKAGE_VERSION);
```

Prepare your build environment:

```
$ ./autogen.sh
```

On next steps we will proceed with configuration and build for each platform needed.

For i386-pc:

```
$ ./configure --disable-werror
$ make && make install

$ /usr/local/bin/grub-mknetdir -d /usr/local/lib/grub/i386-pc --net-directory=/tmp
Netboot directory for i386-pc created. Configure your DHCP server to point to /tmp/boot/grub/i386-pc,
```

For 32-bit EFI:

```
$ ./configure --with-platform=efi --target=i386 --disable-werror
$ make && make install

$ /usr/local/bin/grub-mknetdir -d /usr/local/lib/grub/i386-efi --net-directory=/tmp
Netboot directory for i386-efi created. Configure your DHCP server to point to /tmp/boot/grub/i386-e
```

For 64-bit (U)EFI:

```
$ ./configure --with-platform=efi --target=x86_64 --disable-werror
$ make && make install

$ /usr/local/bin/grub-mknetdir -d /usr/local/lib/grub/x86_64-efi --net-directory=/tmp
Netboot directory for x86_64-efi created. Configure your DHCP server to point to /tmp/boot/grub/x86_64-
```

Create a tarball with targeted platform netboot image

```
$ cd /tmp

$ tar -cvzf drlm_grub2_<target>-<platform>.tar.gz boot/
```

Note: This gzipped tarball can be extracted to DRLM \$STORDIR on your DRLM server, for testing purposes or to provide support to new platforms not yet provided by DRLM package builds.

Note: This section should change continuously due to changes in DRLM development, please be patient. Any question regarding DRLM development, please use [DRLM Dev Forum](#)¹¹. Thanks!

3.10 About DRLM Docs

DRLM Docs contains comprehensive documentation on the DRLM (Disaster Recovery Linux Manager). This page describes documentation's licensing, editions, and versions, and describes how to contribute to the DRLM Docs.

For more information on DRLM, see [About DRLM Project](#)¹². To download DRLM, see the downloads page.

3.10.1 License

This documentation is licensed under a Creative Commons [Attribution-NonCommercial-ShareAlike 4.0 International](#)¹³ (i.e. "CC-BY-NC-SA") license.

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3.10.2 Contributing

Please, we encourage you to help us to improve this documentation.

To contribute to documentation the Github interface enables users to report errata or missing sections, discuss improvements and new sections through the issue-tracker at: [DRLM Docs GitHub Issue Tracker](#)¹⁴.

¹¹ <https://groups.google.com/forum/#!forum/drlm-dev>

¹² <http://drlm.org/about/>

¹³ <http://creativecommons.org/licenses/by-nc-sa/4.0/>

¹⁴ <https://github.com/brainupdaters/drlm-docs/issues>

3.10.3 Product Features

The following features are supported on the most recent releases of DRLM. Anything labeled as (NEW!) was added as the most recent release.

- Hot maintenance capability. A client backup can be made online while the system is running.
- Command line interface. DRLM does not require a graphical interface to run. (console is enough).
- Multiarch netboot client support (x86_64-efi, i386-efi, i386-pc)
- Centralized backup scheduling
- Installclient workflow (NEW!)
- Parallel backups (NEW!)
- Sqlite3 database backend (NEW!)
- Error reporting support to:
 - HP OpenView
 - Nagios (NEW!)
 - Zabbix (NEW!)
 - Mail (NEW!)

3.10.4 DRLM Version 2.0.0 (July 2016) - Release Notes

- Multiarch netboot with GRUB2 - x86_64-efi i386-efi i386-pc - (issue #2)
- New installclient workflow (issue #5)
- Added support for systemd distros - RHEL7 CentOS7 Debian8 - (issue #14)
- Use bash socket implementation instead of netcat (issue #15)
- runbackup workflow enhancement with sparse raw images with qemu-img reducing backup time and improving management (issue #16)
- Added support for parallel backups on DRLM (issue #22)
- Added support for new DB backend sqlite3 (issue #23)
- Added support for Nagios error reporting (issue #28)
- Added support for Zabbix error reporting (issue #29)
- Added support for Mail error reporting (issue #30)
- Added timeout var for Sqlite in sqlite3-driver.sh for avoiding database locks.
- Added source of local.conf and site.conf files in drlm-stord
- Solved lots of bugs
- DRLM documentation updated to reflect version 2.0 changes

Note: This documentation is under constant development. Please be patient...

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