Disaster Recovery management with

ReaR
www.relax-and-recover.org

&

DRLM
DISASTER RECOVERY LINUX MANAGER

Didac Oliveira
DRLM Chief Architect & Core Developer

DRLM Workshop
- What is DRLM?
- DRLM features
- DRLM Project history
- How to contribute?
- DRLM roadmap
What is DRLM?
GNU/Linux Disaster Recovery

Search: LINUX DISASTER RECOVERY SOLUTION

See appendix A for more detailed info.
What is DRLM?
Protocols & Services

- DHCP
- DRLM STORE
- HTTPs
- SSH
- TFTP
- NFS
What is DRLM?
Backup process explanation

1. **Client verifications**
2. **Gather client disk usage**
3. **DRLM image creation**
4. **ReaR Backup**
5. **Register Backup in DRLM**
6. **Enable Backup**

- **On Failure**
  - **Report ERROR**
  - **Rollback to previous Backup**
What is DRLM?
Recovery process explanation

- Network Boot (PXE)
- Load Kernel & Initrd
- Rescue Mode
- Network setup
- ReaR recover
- Customizations and/or Reboot
What is DRLM?
Command Line Interface (CLI)

Network Operations:
ADD, DELETE, MODIFY & LIST

Client Operations:
ADD, INSTALL, DELETE, MODIFY & LIST

Backup Operations:
RUN, MANAGE, DELETE,
EXPORT, IMPORT & LIST

Job Scheduler Operations:
ADD, DELETE, SCHED & LIST

For more information please visit:
http://docs.drlm.org
Integration with system monitoring tools:

- EMAIL
- ZABBIX
- Nagios®
- HP
DRLM features
Unattended ReaR installation and base config

Supported OSes:
- Debian
- Red Hat
- SUSE
- Ubuntu
- one-shot jobs
- job expire dates
- job repetition:
  - Minutes
  - Days
  - Months
  - Hours
  - Weeks
  - Years
Export & import DR images between DRLM servers on different sites and/or locations, made easy.

See appendix B for more detailed info.
DRLM Project history

3 years of hard work ...

2013 AUG: DRLM Project born
2013 DEC: First DRLM stable version (1.0.0)
2014 DEC: DRLM full integration with ReaR
            (issue #522) – ReaR 1.17
2016 JUL: DRLM version 2.0.0 released
2017 JAN: DRLM version 2.1.0 frozen

See appendix C for more detailed history.
How to contribute?
Here are some options ...

• Try our latest versions and give us your feedback
• Write code to improve or extend DRLM
• Start discussions for new feature proposals
• Report Issues to improve our code and/or documentation
  github.com/brainudpaters/drlm & github.com/brainudpaters/drlm-docs
• Share your experience with DRLM

Visit http://drlm.org/community/ for more information.
Please come to the latest talk of Backup and Disaster Recovery Developer room:

**Future ideas for ReaR, DRLM, and Bareos**

17:45H

An informal talk with ReaR, DRLM, and Bareos users about what they would like to get implemented in future ReaR, DRLM, and Bareos versions.
Workshop
Workshop preparation:

Follow the instructions in:

• https://github.com/brainupdaters/fosdem17_workshop

Requirements:

• Virtualbox & extension pack installed
• Vagrant installed
• Required vagrant boxes downloaded
DRLM Workshop

Environment scenario

rear-centos
10.100.0.10

to

rear-suse
10.200.0.11

rear-ubuntu
10.200.0.12

rear-debian
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DRLM Workshop

Environment scenario
DRLM install docs:

Installation instructions: http://docs.drlm.org/en/latest/Install.html

• RHEL & CentOS
• Debian & Ubuntu
• SLES
First of all, we must configure the required networks to manage from DRLM, where the clients will be.

```
# drlm addnetwork -n vboxnet1 -i 10.100.0.0 \ 
-m 255.255.255.0 -g 10.100.0.254 -s 10.100.0.50

# drlm addnetwork -n vboxnet2 -i 10.200.0.0 \ 
-m 255.255.255.0 -g 10.200.0.254 -s 10.200.0.50
```
Adding clients can be done in one or two separated steps. Installing them at the same time that adding them to DRLM or just adding them without installation & base configuration.

commands:

```
# drlm addclient -c rear-centos -i 10.100.0.10/24 -I -U \
http://download.opensuse.org/repositories/Archiving:/Backup:/Rear/CentOS_7/x86_64/rear-2.00-1.el7.x86_64.rpm

# drlm addclient -c rear-ubuntu -i 10.200.0.12/24 -I \
-u vagrant

# drlm addclient -c rear-debian -i 10.100.0.13/24
# drlm instclient -c rear-debian -u vagrant
```
Each client can have multiple backup jobs configured, with different schedules, also one-shot jobs can be planned, avoiding the need to keep open terminals or the use of nohup or screen, as well as to run extra backups that were not planned previously.

```bash
# drlm addjob -c rear-centos -s 2017-02-04T11:45 \ -e 2017-02-04T11:55 -r 5min
# drlm addjob -c rear-ubuntu -s 2017-02-04T11:46 -r 5min
# drlm addjob -c rear-debian -s 2017-02-04T11:47
```
Here we will configure e-mail error reporting in DRLM and force backup error to receive an alert.

```bash
# apt-get install heirloom-mailx sendmail

# vi /etc/drlm/local.conf
...
ERR_REPORT=yes
REPORT_TYPE=mail
MAILCMD=$(which mailx)
MAILSUBJECT="DRLM FOSDEM17 ERROR ALERT ($HOSTNAME)"
MAIL_TO="didac@brainupdaters.net"

# vi /etc/drlm/alerts/mail.cfg

set from="alerts@drlm.org(FOSDEM17 ALERTS)"
set smtp-use-starttls
set ssl-verify=ignore
set smtp-auth=login
set mtps=smtp://smtp.gmail.com:587
set smtp-auth-user=didac@brainupdaters.net
set smtp-auth-password=$(cat /root/passwd_mail)
set nss-config-dir=/etc/ssl/certs
```
Each backup in DRLM can be enabled or disabled manually. In case of problems with the latest backup you can enable a previous one to recover from it. Or just to rollback to a previous state if the client was upgraded or reconfigured and you are experiencing issues since those changes were applied.
In this example we are using the same networks in the target and source DRLM server, but they could be different, remember to adjust network config, hostnames, ... after recovering on different networks with different hostnames, ... that's all.
Here we will export any available DR image to a local directory and then, send it to the destination DRLM server.
Export & Import operations

```
# drlm impbackup -c rear-debian -f /tmp/export.dr
# drlm listbackup -A
```

<table>
<thead>
<tr>
<th>Backup Id</th>
<th>Client Name</th>
<th>Backup Date</th>
<th>Backup Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.20170204121505</td>
<td>rear-debian</td>
<td>2017-02-04 12:15</td>
<td>true</td>
</tr>
</tbody>
</table>

Importing DR image to destination DRLM server will enable it automatically and you could be able to start recovering from it immediately.
1. Power off the VM to be restored.
2. Disable its NAT network device.
3. Set Boot order 1st device to Network.
4. Boot VM from network.
5. Select 1st option in DRLM boot menu.
6. Enter root username to the booted ReaR recovery.
7. Run `dhclient & rear recover`

```bash
# rear -v recover SERVER=<server_ip> REST_OPTS=-k ID=<client_name>
```
• Keep /var/lib/drlm/arch in a separated filesystem with enough space to store all required DR images.

• Adjust kernel loop limit properly (max_loops) according to the number of clients to manage.

• Install DRLM in a dedicated server.

• Configure NTP and set correct Timezone.

• Avoid other PXE services in DRLM managed networks.

• Recommended 4GB of RAM minimum.
Questions & Answers
Appendix
ReaR is the best standalone Disaster Recovery tool for GNU/Linux. It is able to recover a single system in few minutes from scratch.
What is DRLM?

Brief description of DRLM

DRLM is a centralized management tool for small to large Disaster Recovery implementations using ReaR.

An easy-to-use software for Disaster Recovery management and a great tool for any GNU/Linux SysAdmin.
• Automatic Error Reporting on backup failure
  Nagios, Zabbix, Mail & HP OVO

• Easy GNU/Linux systems migration
  P2V, P2P, V2V & V2P

• Whole Recovery over the network
  Multiarch Netboot support with GRUB2 (DRLM 2.0.0)

• Unattended client installation & configuration
  instclient workflow (DRLM 2.0.0)

• Integrated Backup Job Scheduler
  New feature! (DRLM 2.1.0)
• Import & Export DR images between DRLM servers
  
  New feature! (DRLM 2.1.0)

• Fully supported and tested on major Linux distros
  
  RHEL, CentOS, Debian, SUSE & Ubuntu

• Easy to Use & Setup

• Integrated Debugging/Troubleshooting in DRLM CLI

• Fully developed in BASH

• Open Source
• Import & Export DR images between DRLM servers
• Added support for DRLM on SLES12
• Added support for DRLM on Ubuntu 16.04 LTS
• Addclient improvements:
  New online mode
  New install mode
• Integrated Backup Job Scheduler
• DRLM runbackup execution params inherited in ReaR (eg: -vD)
• Other minor enhancements
- 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
DRLM Project history
From the beginning ...

2013 AUG: DRLM Project born (aka DRLS)

2013 OCT: First DRLM code publication on Github
            github.com/brainupdaters/drlm

2013 DEC: First DRLM stable version (1.0.0)

2014 DEC: DRLM full integration with ReaR
            (issue #522) – ReaR 1.17

2015 JAN: Publication of project websites
            www.drlm.org & docs.drlm.org

2015 MAR: DRLM version 1.1.1 released
| 2015 MAY: | DRLM 2.0.0 roadmap |
| 2016 JAN: | DRLM present at FOSDEM’16 |
| 2016 JUL: | DRLM version 2.0.0 released |
| 2016 AUG: | DRLM 2.1.0 roadmap |
| 2017 JAN: | DRLM version 2.1.0 released |
| 2017 FEB: | Here we are! again at FOSDEM’17 |
| 2017 MAR: | New DRLM version roadmap |
DRLM Team
Project founders & maintainers

Didac Oliveira  Pau Roura  Ruben Carbonell
Co-Owner & Co-Founder at Brain Updaters, S.L.L.

Co-Founder & Maintainer at DRLM Project

*Other OpenSource contributions:*

- **Relax-and-Recover** (ReaR)
  www.relax-and-recover.org

- **Config-to-HTML** (cfg2html v6.x)
  www.cfg2html.com