Relax and Recover:
"The OpenSource [mksysb] for Linux on Power."

Sébastien Chabrolles
s.chabrolles@fr.ibm.com
Power System Linux Center
IBM Montpellier Client Center

May 17th, 2017
When adversity strikes ...
“If anything can go wrong... it will.”  (Murphy’s law)

KEEP
CALM
RELAX
AND
RECOVER

My Backup Server was there!
Backup Strategy and Disaster Recovery

“What should I do if a disaster strikes”

• Backing up your server are necessary ... but not enough
  – Backups must be externalized.
  – Backup strategy must be defined (what to backup, how, when ...).
  – Disaster Recovery plan must be defined.

• What is Disaster Recovery?
  The process by which a business function is restored to the normal, steady state after a disaster.

• What is Business Continuity?
  The way that a business function will operate after a disaster, until such time as the normal, steady state is restored.
• DRP addresses need to recover from an emergency with minimum impact to the enterprise.
  – Protects enterprise from major services failure
  – Minimizes risk to enterprise from delays in providing services
  – Guarantees reliability of standby systems by testing and simulation
  – Minimizes personnel decision-making required during disaster recovery

• Backups of data are necessary! but not enough in case of losing the complete Operating System.
  – Reinstalling the OS from scratch takes hours
  – Restoring the backups a few more hours
  – Fine-tuning of configurations takes days
  – Even months later issues pop up!

• It is absolute necessary to foresee an inventory of hardware and software and use tool to quickly rebuild completely a system:
  – From scratch
  – OS + configuration + data (as it was before)
  – Mostly Automated. (speedup + avoid human error)
Flash Archive (up to Solaris 10)

HP Ignite-UX

IBM mksysb

OS recovery tools are part of most of the UNIX since 90’s!
What is the `mksysb` command?

```markdown
# man mksysb
mksysb Command
Purpose: Creates an installable image of the root volume group either in a file or onto a bootable tape.

Source: AIX mksysb man page

**Translation:**
Provides System Administrators the assurance of a BMR (*Bare-Metal Recovery*) solution, a provisioning tool, or way to roll back a system after a bad update.

=> Keeps SysAdmins from losing their jobs when all hell breaks loose.

1. **Bootable:** *(hd5 / spot)*
2. **LVM + FS Layout:** *image.data*
3. **System Backup:** *result of AIX `backup` command*

- Stored in bootable tape or NIM server images.
- Could be restored on dissimilar POWER HW.
“Only wimps use tape backup: **REAL** men just upload their important stuff on ftp and let the rest of the world mirror it.”

– Linus Torvalds –

1996-07-20: linux-kernel mailing list [link]
Go to the community ...

Image Your Hard Drive using `dd`

Submitted by sandip on Fri, 02/11/2005 – 21:15

- Boot from the live cdrom distribution.
- Switch to root.
- Make sure **NO partitions** are mounted from the source hard drive.

1- **Mount the external HD.**
   
   ```
   # mount -t vfat /dev/sda1 /mnt/sda1
   ```

2- **Back up the drive.**
   
   ```
   # dd if=/dev/hda conv=sync,noerror bs=64k | gzip -c >
   /mnt/sda1/hda.img.gz
   ```

3- **To restore your system:**
   
   ```
   # gunzip -c /mnt/sda1/hda.img.gz | dd of=/dev/hda
   conv=sync,noerror bs=64K
   ```

**Limitations:**

- Full Backup Only
- Full restore is the only option
- Backup cannot be made “Live”. Need to reboot the server on DVD rescue to backup the server.
- Restore on the same Hardware.
### Why Linux doesn’t provide a tool like “mksysb” by default?

... simply because “Linux is not UNIX” ;-) ...

<table>
<thead>
<tr>
<th>System Architecture</th>
<th>IBM (Power)</th>
<th>RHEL 6: Red Hat has certified <strong>939</strong> different servers from <strong>42</strong> vendors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk Partitioning</td>
<td>Logical Volumes</td>
<td>Logical Volumes, Partitions, Software RAID, Raw Disk, Any block device!</td>
</tr>
<tr>
<td>Filesystem Type</td>
<td>JFS, JFS2</td>
<td>Ext2,3,4, btrfs, Reiserfs, VFAT, XFS, JFS, OCFS2 ....</td>
</tr>
<tr>
<td>Bootloader</td>
<td>bosboot</td>
<td>LILO, GRUB, GRUB2, ELILO, yaboot, lilo (SUSEppc), EXTLINUX ...</td>
</tr>
</tbody>
</table>

Source: Red Hat 6 Release Notes
Some “Linux compatible” Backup tools:

- SEP Sesam
- Relax and Recover*
- Storix*
- Cristie*
- IBM TSM
- HP DataProtector
- Symantec Netbackup
- Duplicity
- CommVault Galaxy
- EMC Networker
- Bacula
- Bareos
- Rsync
- GNU tar

* Close to mksysb functionalities
Relax and Recover – *(aka ReaR)*

- OpenSource Disaster Recovery Solution for Linux
  
  
  [https://github.com/rear/rear](https://github.com/rear/rear)

GPL 3 Software – Developers in Germany and Belgium

- 100% Bash script – no GUI and no dependencies
- Utilize kernel, modules, binaries of host (kernel ≥ 2.6)
- Support any combination of SW/HW RAID, LVM
- Internal backup on CIFS, NFS ...
- Boot media on CD/DVD, USB key and LAN (PXE)
- Successor of mkCDrec
• Which backup mechanism to use?
  – Internal: GNU tar, rsync
  – External: Bacula, Commercial backup program

• Where will the backups reside?
  – external USB disk, tape, local spare disk
  – Remote network location:
    • NFS share
    • CIFS share
    • sshfs (via fuse)

• How shall we start the rescue image?
  – CDROM (ISO image)
  – tape (OBDR)
  – USB disk
  – Network (PXE)
Installing Relax and Recover

• **With your preferred package manager.**
  – Rear is included in several Linux official repo's (Fedora, EPEL and SLES)
    
    *(It is now shipped in RedHat and Sles HA extension.)*

    • `yum install rear`
    • `zypper install rear`
    • `apt-get install rear`
  – But not always the latest stable version available.

• **Directly from the source repository.**
  – Github: [https://github.com/rear/rear](https://github.com/rear/rear)

    # git clone https://github.com/rear/rear
    # cd rear
    (# git checkout rear-2.00)
    # make
    # make install

  – Possibility to generate packages:
    • rpm package: `make rpm`
    • debian package: `make deb`

More information [https://github.com/rear/rear/blob/master/README.adoc](https://github.com/rear/rear/blob/master/README.adoc)
Rear is very easy to use: `rear [options] <command>`

- **Available options:**
  - `-h` or `--help` for usage information.
  - `-c DIR` for an alternative configuration directory instead of `/etc/rear`.
  - `-d` for debug mode, logging debug messages.
  - `-D` for debugscript mode, logging every function call (via `set -x`).
  - `--debugscripts SET` same as `-d -v -D` but debugscript mode with `set -SET`.
  - `-r KERNEL` for kernel version to use; current: `3.10.0-327.22.2.el7.ppc64le`.
  - `-s` for simulation mode, showing what scripts `rear` would include.
  - `-s` for step-by-step mode, acknowledging each script individually.
  - `-v` for verbose mode, showing more output.
  - `-V` or `--version` for version information.

- After initial configuration, a simple “`rear mkbackup`” will be sufficient to backing up your system.

**List of commands:**
- `checklayout` check if the disk layout has changed.
- `dump` dump configuration and system information.
- `format` format and label media for use with `rear`.
- `mkbackup` create rescue media and backup system.
- `mkbackuponly` backup system without creating rescue media.
- `mkrescue` create rescue media only.
- `recover` recover the system.
- `validate` submit validation information.

Use `rear -v help` for more advanced commands.
ReaR – backup process

1. **rear mkrescue**
   - Create a **Bootable** Media including:
     - Disk / Raid / LVM / FS layout.
     - Network configuration.
   - Boot media can be sent to a remote location.

2. **rear mkbackuponly**
   - Backup Data with possibility to send it to a remote location.

*All those steps are done “online”.*
"rear mkrescue" command creates a bootable media with:
  - all the information needed to recreate the server FS structure
  - Set of useful tool for recovery (fdisk, partprobe ...).
  - IP info => allow network recovery.

Format can be: ISO, USB, ODBR (tape), PXE (network)
  - Use OUTPUT variable to set rescue device type.
  - Use OUTPUT_URL to set its location (can be remote with nfs, sshfs etc..)
    if unset, OUTPUT_URL = BACKUP_URL (see mkbackuponly)

Remote server

<table>
<thead>
<tr>
<th>OUTPUT=ISO</th>
<th>OUTPUT=PXE</th>
<th>OUTPUT=ODBR</th>
<th>OUTPUT=USB</th>
</tr>
</thead>
</table>

OUTPUT_URL=nfs://<IP>/PATH  
OUTPUT_URL=ftp://<IP>/PATH  
OUTPUT_URL=cifs://<IP>/PATH  
OUTPUT_URL=sshfs://<IP>/PATH
• “rear mkbackuponly” command starts the “Real Data” backup.

• Backup could be:
  – Internal: Managed by REAR with OS tool like TAR.
  – External: Managed by Third-Party backup product like: IBM Spectrum Protect (TSM), NetBackup, HP Protect etc…

• Internal Backup are defined via BACKUP variable
  – BACKUP = NETFS uses TAR with compression (gzip by default) to store backup in a remote server.
  – BACKUP = RSYNC uses rsync to copy files to backup to a remote server.

• BACKUP_URL defines the remote location of backup. The following remote storage protocol are supported:
  – BACKUP_URL=file:///directory/path/
  – BACKUP_URL=tape:///dev/nst0
  – BACKUP_URL=nfs://nfs-server-name/share/path
  – BACKUP_URL=cifs://cifs-server-name/share/path
  – BACKUP_URL=sshfs://root@server/export/archives

• More information here: https://github.com/rear/rear/blob/master/doc/user-guide/03-configuration.adoc
• Define your Rear setting in /etc/rear/local.conf (or /etc/rear/site.conf)
  – site.conf parameter variable will be overwritten by local.conf

```plaintext
### write the rescue initramfs to USB and update the USB bootloader
OUTPUT=ISO

### create a backup using the internal NETFS method, using 'tar'
BACKUP=NETFS

### write both rescue image and backup to the device labeled BACKUP_URL
BACKUP_URL=nfs://10.7.19.177/rear

### Activate SSH with the following root password for rescue
SSH_ROOT_PASSWORD="reardemo"
```
**ReaR – Recover workflow**

1. **Boot on the REAR-rescue media**

   1. Boot on the REAR-rescue media
   2. Run "rear recover"
      - Check HW, disk/FS layout versus backup info
      - Recreate FS layout (partition/RAID/LVM/FS)
      - Mount remote FS for backup restoration
      - Restore the backup data
      - Rebuild initrd / bootloader if needed.
   3. Inspect result (mounted in /mnt/local) & Reboot.

2. **Backup Server (10.7.19.177)**
   - Mount remote directory
   - Restore data
   - Rebuild boot image
   - Recreate RAID/LVM/FS.
   - Mount FS

3. **Linux server to recover**
Simple Backup / Restore using ReaR with NetFS
**Objective:** Simple backup of a KVM guest using:
- ISO image as bootable Rescue-DVD.
- NFS server to store the Backup.

1. Use "**rear -v mkbackup**" to create:
   A. A bootable DVD on the KVM host
   B. A Full tar backup on a remote server via NFS.

2. **Do something BAD** to BREAK your system *(prevent it to reboot properly.)*

3. Reboot the system ... **FAILED !!!** 🐈

4. Boot on a ReaR rescue bootable device.
5. Recover the system: "**rear -v recover**"
6. Reboot again on the real system.
# Default is to create Relax-and-Recover rescue media as ISO image
# set OUTPUT to change that
# set BACKUP to activate an automated (backup and) restore of your data
# Possible configuration values can be found in /usr/share/rear/conf/default.conf
#
# This file (local.conf) is intended for manual configuration. For configuration
# through packages and other automated means we recommend creating a new
# file named site.conf next to this file and to leave the local.conf as it is.
# Our packages will never ship with a site.conf.

### write the rescue initramfs to USB and update the USB bootloader
OUTPUT=ISO

### create a backup using the internal NETFS method, using 'tar'
BACKUP=NETFS

### write both rescue image and backup to the device labeled BACKUP_URL
BACKUP_URL=nfs://10.7.19.177/rear

### Activate SSH with the following root password for rescue
SSH_ROOT_PASSWORD="reardemo"
I need more “enterprise ready” features

This is interesting ... but ...

• I got hundreds of server to manage
  ⇒ I don’t want to spend my “precious” time in copying or managing DVD “rescue media”
  ⇒ I would need help to migrate on NEW hardware.

• I already have a “Enterprise backup solution”.
  ⇒ I don’t want to backup twice
  ⇒ And my Backup solution has better feature like “deduplication” or point in time restore..

• My company is “unique” and doing very “special stuff”...
  ⇒ I need a “special tool” to backup my “special systems”
Setting up a “Net Boot” server for Linux on Power

PXE boot is not “natively” available on Linux on Power, but “grub2” provides a network-boot with similar functionality

1. Install and enable tftp service on your server *(example for RedHat here under)*
   - `yum install tftp-server`
   - enable tftp server by setting “disable=no” in “/etc/xinetd.d/tftp”
   - `systemctl start xinetd` & `systemctl enable xinetd`
   - Update your Firewall configuration if needed *(firewall-cmd -add-service=tftp --permanent)*

2. Create a **grub2 network boot** directory in your tftpboot directory.
   - `grub2-mknetdir --net-directory=/var/lib/tftpboot`
   - This will create a “boot” directory with all the files needed for a Power network boot.
   - **THIS OPERATION MUST BE RUN ON A LINUX ON POWER !!!!!**

3. You will have to update your dhcpd.conf to use `/boot/grub2/powerpc-ieee1275/core.elf` as filename

```
# DHCP Server Configuration file.
# see /usr/share/doc/dhcp*/dhcpd.conf.example
# see dhcpd.conf(5) man page
#
subnet 10.7.19.0 netmask 255.255.255.0 {
  allow bootp;
  next-server 10.7.19.177; # tftpserver ip address
  filename "/boot/grub2/powerpc-ieee1275/core.elf";
  option routers 10.7.19.254;
  host sles11sap-144 {
    hardware ethernet 1a:f4:ea:94:64:0c;
    fixed-address 10.7.19.144;
  }
}
```

• ReaR capability to generate “grub styled” PXE configuration will be available in ReaR 2.1.
(You can still test it by getting latest code from github or use a package version > rear-2.00-1.git201705041626.ppc64le.rpm)

• Use OUTPUT=PXE and PXE_CONFIG_GRUB_STYLE=y in your local.conf file to enable it.

• You also have to specify URLs where ReaR can put files generated for recovery:
  – PXE_TFTP_URL: location used to store “rear-kernel” and “rear-initrd”
    ⇒ it must point to the root of your tftp server (tftpboot dir)

  – PXE_CONFIG_URL: location used to store the dedicated “grub.cfg” file which contain information about location of the “rear-kernel” and “rear-initrd” file.
    ⇒ It must point to (tftpboot dir)/boot/grub2/powerpc-ieee1275
    ⇒ During boot sequence, tftp client looks for a file named grub.cfg-<MAC_ADDRESS> or grub.cfg-<IP_HEX>

Extract of local.conf with PXE configuration

```
# Using PXE/NetBoot Server Rescue image
OUTPUT=PXE
PXE_CONFIG_GRUB_STYLE=y
PXE_TFTP_URL="nfs://10.7.19.177/var/lib/tftpboot"
PXE_CONFIG_URL="nfs://10.7.19.177/var/lib/tftpboot/boot/grub2/powerpc-ieee1275"
```
ReaR provides simple integrated full backup.

ReaR is really focus on disaster recovery and not backup.

- It could be integrated with common backup software to delegate "file backup" to a real backup infrastructure:
  - Backup software: Data storage and retrieval
  - ReaR: Recover system layout and make it work again
  - ReaR orchestrates the overall process and use the backup software to restore the backup data.

⇒ Use the best tool for the job.

- Enabled by setting "BACKUP" variable.
- Currently compatible with:

  - Tivoli Storage Manager (BACKUP=TSM)
  - HP Data Protector (BACKUP=DP)
  - Symantec NetBacakup (BACKUP=NBu)
  - Galaxy 5, 6, and 7 (BACKUP=GALAXY)
  - Galaxy 10 [Commvault Simpana] (BACKUP=GALAXY10)
  - Bacula (BACKUP=BACULA)
  - Bareos (BACKUP=BAREOS) (A fork of Bacula)
  - Rsync Backup Made Easy (BACKUP=RBME)
  - Duplicity/Duply (BACKUP=DUPLICITY)
  - EMC NetWorker, also known as Legato (BACKUP=NSR)
  - SEP Sesam (BACKUP=SESAM)
  - Borg Backup (BACKUP=BORG)
  - FDR/Upstream (BACKUP=FDRUPSTREAM)
  - Novastor NovaBACKUP DC (BACKUP=NBKDC)
ReaR is really focus on **disaster recovery** and **not backup**. *(repeat)*

- Don’t run “`rear mkbackup`” => use your external backup tool with scheduling policy.
- Use “`rear mkrescue`” to create the bootable rescue device.

⇒ Don’t forget to update it regularly *(run `rear mkrescue`) if you
  - change your disk / FS layout (creating or resizing LV and FS)
  - modify backup client configuration files.

**TIPS:**

- “`rear checklayout`” command determines if there is any change in the fs layout since the last “`rear mkrescue`”.
  - Return 0 => no change
  - Return 1 => change: need to regenerate rescue device.

⇒ You can simply use the following cron schedule task to automate this.

```bash
#cat /etc/cron.d/rear
30 1 * * * root /usr/sbin/rear checklayout || /usr/sbin/rear mkrescue
```
ReaR – Migration, Restoring to a different HW.

• Enable recovery on dissimilar hardware.
  (that is not the same as the original system but still the same arch).

For example:
  – P2V, V2P, V2V, P2P
  – From POWER7 to POWER8
  – From VIOS vscsi to Direct SAN
  – From PowerKVM to PowerVM
  …

• **Network** :
  – network and storage drivers are adjusted
  – remap network MAC addresses
  – use another IP address, or using dhcp via templates or from kernel command line

• **Disks** :
  – map hard disks if they do not match (e.g. hda -> sda)
  – rebuild the initial ramdisk if needed (for new storage drivers)
  – migration to SAN storage (Experimental)
1. ReaR rescue over the Network
2. ReaR integration with TSM
3. Restoration on dissimilar HW
**Objectives:**

1. Migrate a Sles11 KVM guest to PowerVM LPAR
   - From virtio network to virtual ethernet (New MAC !!)
   - From virtio filebacked disk to NPIV SAN based (vda -> mpatha)
   - New device driver (ibmvscsi, ibmveth, ibmvfc) => need to rebuild “initrd” ramdisk.

2. Use an “Enterprise Backup Solution” (like TSM) to Backup/Restore the System
• By default ReaR exclude multipath device (disable this)
• Our target system boot over SAN disk
  This will force multipath configuration during block device probing

• Use PXE to store rescue media
• PXE with grub2 mode (POWER compatible)
  • PXE_TFTP_URL must be your tftpboot root dir.
  • OUTPUT_PREFIX_PXE store rescue data in this subdir.
  • PXE_CONFIG_URL: where client will find boot cmd to use

• PXE_CREATE_LINKS=IP : Use IP suffix instead of MAC
  (because we want to migrate to a different HW)

• PowerVM can have trouble during boot if “initrd” size is too BIG
  Using a better compression like lzma (.xz) can help

• Reduce to the minimum the TSM client binary to copy to the ReaR rescue image => reduce initrd size.

# Default is to create Relax-and-Recover rescue media as ISO image
# set OUTPUT to change that
# set BACKUP to activate an automated (backup and) restore of your data
# Possible configuration values can be found in /usr/share/rear/conf/default.conf
# This file (local.conf) is intended for manual configuration. For configuration
# through packages and other automated means we recommend creating a new
# file named site.conf next to this file and to leave the local.conf as it is.
# Our packages will never ship with a site.conf.

# Prepare for Migration to PowerVM with BootOnSAN
AUTOEXCLUDE_MULTIPATH=n
BOOT_OVER_SAN=y

# Using PXE/MetBoot Server Rescue image
OUTPUT=PXE

  PXE_CONFIG_GRUB_STYLE=y
  PXE_TFTP_URL="nfs://10.7.19.177/var/lib/tftpboot"
  OUTPUT_PREFIX_PXE=rear/$HOSTNAME
  PXE_CONFIG_URL="nfs://10.7.19.177/var/lib/tftpboot/boot/grub2/powerpc-ieee1275"
  PXE_CREATE_LINKS=IP
  PXE_REMOVE_OLD_LINKS=y

# Backup TSM
BACKUP=TSM

# Reduce initrd for PowerVM
REAR_INITRD_COMPRESSION=lzma

COPY_AS_IS_TSM=( /etc/adsm/TSM-PWD /opt/tivoli/tsm/client/ba/bin/dsmc
/ opt/tivoli/tsm/client/ba/bin/tsmbench_inclxml /opt/tivoli/tsm/client/ba/bin/dsm.sys
/ opt/tivoli/tsm/client/ba/bin/dsm.opt /opt/tivoli/tsm/client/ba/bin/EN_US/dsmclientV3.cat
/ /usr/local/ibm/gsk8* )
• **Enterprise Solution**
  — Fully automated.
  — Seamless integration with most popular Enterprise Backup Solution.

• **Open Source (GPL)**
  — Source code included (100% bash).

• **Modular Design**
  — Easily extendible with new functions.

• **Scalability**
  — One solution for all Linux systems, unlimited scale-out.

• **Usability**
  — Documentation, community & commercial support.
Want to participate to the ReaR community?

- ReaR code is hosted on github.
  
  ![GitHub](https://github.com/rear/rear)

- Possibility to raise issues or propose modifications.

- Since 2015 (rear 1.18), some IBMers contribute to improve POWER architecture support:
  - Multipathing support
  - PowerVM Bootlist generation after recover
  - PPC64 with Yaboot support
  - PPC64LE with grub2 support
  - Ubuntu support
  - PowerKVM guest support
  - PowerNV support
  - PowerKVM <=> PowerVM Migration
  - IBM TSM integration
  - PowerVM/KVM netboot support (grub2 netboot)

Thanks to Jason Furmaneck (IBM USA), Masanori Mitsugi (IBM JP), Sebastien Chabrolles (IBM FR)

POWER test Matrix: [https://github.com/rear/rear/wiki/Test-Matrix-rear-1.19#hardware-vendors](https://github.com/rear/rear/wiki/Test-Matrix-rear-1.19#hardware-vendors)

ReaR Core Team:
- Gratien D’haese (ReaR main author)
- 4 main Developers (1 from Suse)

+ 60 contributors:
  - At least “3 known” IBMers
ReaR version and POWER support

Even if ReaR supports POWER arch since more than 2 years now, a lot of issues were corrected recently (especially regarding “multipathing “support ).

If the version provided to the distribution doesn’t work for you, I really encourage you to test the latest version available on github (master branch)

PowerVM firmware & linux kernel 256MB RMA limit.

– kernel and drivers need more and more place.
  initrd in rescue media (like RedHat rescue or ReaR) can be bigger than 100MB.
  => PowerVM LPAR cannot load firmware + kernel + initrd ...

New Linux kernel should switch to a 512MB RMA size.
This should be included in RHEL 7.4 and a backport for RHEL 7.3 is in discussion.

BUGZILLA

Workaround: Use “REAR_INITRD_COMPRESSION=lzma” in your “local.conf” file. It should reduce your initrd size by half, but use more CPU time to be generated.
Relax-and-Recover (Rear) Consultancy Services:

- Help with writing & implementing DR policy
- Designing & configuring rear as a central recovery solution
- Proof of Concept
- Training Session / Workshop

Relax-and-Recover (Rear) Support Services:

1. Limited Support Contract
2. Business Hours Support Contract
3. 24x7 Support Contract

Gratien D’haese, “Relax-and-Recover” author and founder of “IT3 Consultants”, provides IT services, consulting and support around ReaR and Disaster Recovery.

Website: http://it3.be/rear-support/index.html
Non OpenSource: Linux System Recovery Tools

- Founded in 1999 by the author of IBM’s sysback
- Bare-metal recovery for Linux since 2002
- TSM Integration since 2007
- Bare-metal recovery for Solaris since 2008
Non OpenSource: Linux System Recovery Tools

http://www.cristie.com/

Enhance your server protection planning with Power Systems and Cristie Recovery Suite. We're proud to support system recovery, migration and replication for Linux and AIX on Power Systems. Read more
Thank you for your attention ...

Any Question?

Sébastien Chabrolles
s.chabrolles@fr.ibm.com
Power Systems Linux Center
IBM Systems
IBM Client Center Montpellier
France
Montpellier “Power Systems Linux Center” Capabilities & Focus

Power Systems Linux Center for Europes

**Strategic Focus on:**
- Big Data
- Cloud
- Mobile
- Opensource DBs

**Providing Support for:**
- Access to platforms (HW + SW + Support)
- Customer architecture design
- General Developer Resources Support
- ISV Resources Support
- Education / Training

**Capabilities**

**Talk and Teach**: Customer, BP, CSI & ISV Briefings, Demos, Videos
**Design**: Pre-sales Customer support, Customer Consultancy, Architecture Design Workshops
**Prove**: Linux on Power Benchmark & PoCs, Remote Power Linux Platform access

+ Second level of support for technical IIC, IMTs (Infrastructure, Virtualization, OS, Compilers, Certification programs, ...)

**Contact:**
- Philippe Chonavel
  - Open Source & Accelerated Solutions Center Manager
- Alain Roy
  - Engagement Leader
  - Contact: a2roy@fr.ibm.com
- Sébastien Chabrolles
  - Technical Leader
  - Linux on Power Specialist (Performance, Virtualization)
- Julien Limodin
  - Linux on Power Specialist (Middleware knowledge, Mobile & Java skills, Cloud)
- Fabrice Moyen
  - Linux on Power Specialist (Performance, Virtualization, SAP Hana)
- Christophe Menichetti
  - Power Architect (Big Data knowledge / Competitive knowledge)
Notices and Disclaimers

Copyright © 2016 by International Business Machines Corporation (IBM). No part of this document may be reproduced or transmitted in any form without written permission from IBM.

U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. THIS DOCUMENT IS DISTRIBUTED “AS IS” WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IN NO EVENT SHALL IBM BE LIABLE FOR ANY DAMAGE ARISING FROM THE USE OF THIS INFORMATION, INCLUDING BUT NOT LIMITED TO, LOSS OF DATA, BUSINESS INTERRUPTION, LOSS OF PROFIT OR LOSS OF OPPORTUNITY. IBM products and services are warranted according to the terms and conditions of the agreements under which they are provided.

IBM products are manufactured from new parts or new and used parts. In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply.”

Any statements regarding IBM’s future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer’s responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer’s business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.
Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM’s products. IBM EXPRESSLY DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.