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# Migration KVM to VMware with the Partitions Manipulation

On KVM cluster host, shutdown the VM you need to migrate

```
VM_NAME=cportaldiff1-rk
pcs resource disable $VM_NAME
```

Ask to Catherine to create snapshot and attach disks to a server

Connect to the server gived by Catherine

Scan for new disks

```
for DEVICE in `ls /sys/class/scsi_host/host?/scan`; do echo "- - -" > $DEVICE; done
```

Check disks

```
multipath -ll

mpathag (360000970000296700060533030374630) dm-11 EMC     ,SYMMETRIX
size=355G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-+- policy='service-time 0' prio=1 status=active
  |- 1:0:0:8 sday 67:32  active ready running
  |- 1:0:1:8 sdba 67:64  active ready running
  |- 2:0:0:8 sdbc 67:96  active ready running
  `- 2:0:1:8 sdbe 67:128 active ready running
mpathaf (360000970000296700060533030374546) dm-10 EMC     ,SYMMETRIX
size=45G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-+- policy='service-time 0' prio=1 status=active
  |- 1:0:0:7 sdax 67:16  active ready running
  |- 1:0:1:7 sdaz 67:48  active ready running
|- 2:0:0:7 sdbb 67:80  active ready running
  `- 2:0:1:7 sdbd 67:112 active ready running
```

Initialize required variables

```
DEV1=mpathaf (choose the right one, normally the smaller)
DISK1=`fdisk -l /dev/mapper/${DEV1}| grep '^/dev/mapper' | awk '{print  class="code bash"}'| sed 's/.$//'` &&
echo "# $DISK1#
# /dev/mapper/mpathaf
```

```
partprobe $DISK1
```

Get beginning of the boot partition

```
START=`fdisk -l ${DISK1}1 | grep '^/dev/mapper/mpath.*1 ' | awk '{print }'` && echo "# $START"
# 2048
```

Get size of the boot partition

```
SIZE=`fdisk -l ${DISK1}1 | awk '/1p1/ {print +1}'` && echo $SIZE
1026048
```

Copy the VM boot to a file

```
dd if=${DISK1}1 of=boot.img count=$SIZE
```

Copy the IMG to the disk

```
dd if=boot.img of=${DISK1}

# 1026048+0 records in
# 1026048+0 records out
# 525336576 bytes (525 MB) copied, 41,6053 s, 12,6 MB/s
```

The first partition is done, now the LVM partition of the system disk

```
START2=`fdisk -l ${DISK1} | grep '^/dev/mapper/mpath.*2 ' | awk '{print START2=`fdisk -l ${DISK1} | grep
'^/dev/mapper/mpath.*2 ' | awk '{print $2}'` && echo $START2 # 1026048}'` && echo $START2
# 1026048
```

```
NEWSTART=$(($START2+$START)) && echo $NEWSTART
# 1028096 (do a COPY in your buffer of this value)
```

Use fdisk

```
fdisk ${DISK1}
```

```
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.


Command (m for help): p

Disk /dev/mapper/mpathaf: 48.3 GB, 48318382080 bytes, 94371840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000e86b9

              Device Boot      Start         End      Blocks   Id  System
/dev/mapper/mpathaf1   *        2048     1026047      512000   83  Linux
/dev/mapper/mpathaf2         1026048    71229439    35101696   8e  Linux LVM

Command (m for help): d 2
Partition number (1,2, default 2):
Partition 2 is deleted

Command (m for help): n
Partition type:
   p   primary (1 primary, 0 extended, 3 free)
   e   extended
Select (default p): p
Partition number (2-4, default 2):
First sector (1026048-94371839, default 1026048): (do a PASTE from your buffer for the right value)

Last sector, +sectors or +size{K,M,G} (1028096-94371839, default 94371839):
Using default value 94371839
Partition 2 of type Linux and of size 44,5 GiB is set

Command (m for help): t
Partition number (1,2, default 2):
Hex code (type L to list all codes): 8e
Changed type of partition 'Linux' to 'Linux LVM'

Command (m for help): p

Disk /dev/mapper/mpathaf: 48.3 GB, 48318382080 bytes, 94371840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000e86b9

              Device Boot      Start         End      Blocks   Id  System
/dev/mapper/mpathaf1   *        2048     1026047      512000   83  Linux
/dev/mapper/mpathaf2         1028096    94371839    46671872   8e  Linux LVM

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 22: Invalid argument.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Syncing disks.
```

Check if all is OK for the VM's system disk

```
echo $DISK1
# /dev/mapper/mpathaf
```

Check if the VG is well present on the SYSTEM disk

```
partprobe $DISK1
```

```
ll ${DISK1}*

# lrwxrwxrwx 1 root root 8  4 sep 14:40 /dev/mapper/mpathaf -> ../dm-10
# lrwxrwxrwx 1 root root 8  4 sep 14:40 /dev/mapper/mpathaf1 -> ../dm-12
# lrwxrwxrwx 1 root root 8  4 sep 14:40 /dev/mapper/mpathaf2 -> ../dm-13
```

```
pvs
```

```
# PV                  VG    Fmt  Attr PSize   PFree
# /dev/mapper/mpathaf2 root  lvm2 a--   33,47g  13,31g
# /dev/sda2           rootp lvm2 a--  136,21g 108,18g
```

```
vgchange -an root && dmsetup remove ${DISK1}1 && dmsetup remove ${DISK1}2 && pvs
```

```
# PV         VG    Fmt  Attr PSize   PFree
# /dev/sda2  rootp lvm2 a--  136,21g 108,18g
```

Define the second disk (data)

```
multipath -ll

mpathag (360000970000296700060533030374630) dm-11 EMC     ,SYMMETRIX
size=355G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-+- policy='service-time 0' prio=1 status=active
  |- 1:0:0:8 sday 67:32  active ready running
  |- 1:0:1:8 sdba 67:64  active ready running
  |- 2:0:0:8 sdbc 67:96  active ready running
  `- 2:0:1:8 sdbe 67:128 active ready running
mpathaf (360000970000296700060533030374546) dm-10 EMC     ,SYMMETRIX
size=45G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-+- policy='service-time 0' prio=1 status=active
  |- 1:0:0:7 sdax 67:16  active ready running
  |- 1:0:1:7 sdaz 67:48  active ready running
  |- 2:0:0:7 sdbb 67:80  active ready running
  `- 2:0:1:7 sdbd 67:112 active ready running

echo $DEV1
mpathaf

DEV2=mpathag
```

```
partprobe /dev/mapper/${DEV2} && partprobe /dev/mapper/${DEV2}1
```

Initialize variables for the second disk

```
D2START=`fdisk -l /dev/mapper/${DEV2} | grep "^/dev/mapper/${DEV2}1" | awk '{print D2START=`fdisk -l /dev/mapper
/${DEV2} | grep "^/dev/mapper/${DEV2}1" | awk '{print $2}'` && echo $D2START # 2048   D2STARTP1=`fdisk -l /dev/
mapper/${DEV2}1 | grep "^/dev/mapper/${DEV2}1p1" | awk '{print $2}'` && echo $D2STARTP1 # 63   echo $(($D2START+
$D2STARTP1)) # 2111 (do a COPY in your buffer of this value)}'` && echo $D2START
# 2048

D2STARTP1=`fdisk -l /dev/mapper/${DEV2}1 | grep "^/dev/mapper/${DEV2}1p1" | awk '{print D2START=`fdisk -l /dev/
mapper/${DEV2} | grep "^/dev/mapper/${DEV2}1" | awk '{print $2}'` && echo $D2START # 2048   D2STARTP1=`fdisk -l
/dev/mapper/${DEV2}1 | grep "^/dev/mapper/${DEV2}1p1" | awk '{print $2}'` && echo $D2STARTP1 # 63   echo $((
$D2START+$D2STARTP1)) # 2111 (do a COPY in your buffer of this value)}'` && echo $D2STARTP1
# 63

echo $(($D2START+$D2STARTP1))
# 2111 (do a COPY in your buffer of this value)
```

```
pvs
```

```
# PV                  VG    Fmt  Attr PSize   PFree
# /dev/mapper/mpathaf2 cportal  lvm2 a--   33,47g  13,31g
```

```
# /dev/sda2            rootp lvm2 a--  136,21g 108,18g
```

```
vgchange -an cportal && dmsetup remove /dev/mapper/${DEV2}1p1 && dmsetup remove /dev/mapper/${DEV2}1
```

Use Fdisk

```
fdisk  /dev/mapper/${DEV2}
```

```
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.


Command (m for help): p

Disk /dev/mapper/mpathag: 381.2 GB, 381179658240 bytes, 744491520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x0007977c

              Device Boot      Start         End      Blocks   Id  System
/dev/mapper/mpathag1            2048   356159487   178078720    7  HPFS/NTFS/exFAT

Command (m for help): d
Selected partition 1
Partition 1 is deleted

Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-744491519, default 2048): (do a PASTE from your buffer for the right value)

Last sector, +sectors or +size{K,M,G} (2111-744491519, default 744491519):
Using default value 744491519
Partition 1 of type Linux and of size 355 GiB is set

Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): 8e
Changed type of partition 'Linux' to 'Linux LVM'

Command (m for help): p

Disk /dev/mapper/mpathag: 381.2 GB, 381179658240 bytes, 744491520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x0007977c

              Device Boot      Start         End      Blocks   Id  System
/dev/mapper/mpathag1            2111   744491519   372244704+  8e  Linux LVM

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 22: Invalid argument.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Syncing disks.
```

Check if the VG is well present on the DATA disk

```
partprobe /dev/mapper/${DEV2} && pvs
```

```
# PV                 VG      Fmt  Attr PSize   PFree
```

```
# /dev/mapper/mpathag1 cportal lvm2 a--  169,82g  29,63g
# /dev/sda2            rootp   lvm2 a--  136,21g 108,18g
```

```
vgchange -an cportal && dmsetup remove /dev/mapper/${DEV2}1 && pvs
```

```
# PV         VG    Fmt  Attr PSize   PFree
# /dev/sda2  rootp lvm2 a--  136,21g 108,18g
```

Cleanup and disconnect disks from the KVM host

```
multipath -ll
```

```
# mpathag (360000970000296700060533030374630) dm-11 EMC     ,SYMMETRIX
# size=355G features='1 queue_if_no_path' hwhandler='0' wp=rw
# `-+- policy='service-time 0' prio=1 status=active
#   |- 1:0:0:8 sday 67:32  active ready running
#   |- 1:0:1:8 sdba 67:64  active ready running
#   |- 2:0:0:8 sdbc 67:96  active ready running
#   `- 2:0:1:8 sdbe 67:128 active ready running
# mpathaf (360000970000296700060533030374546) dm-10 EMC     ,SYMMETRIX
# size=45G features='1 queue_if_no_path' hwhandler='0' wp=rw
# `-+- policy='service-time 0' prio=1 status=active
#   |- 1:0:0:7 sdax 67:16  active ready running
#   |- 1:0:1:7 sdaz 67:48  active ready running
#   |- 2:0:0:7 sdbb 67:80  active ready running
#   `- 2:0:1:7 sdbd 67:112 active ready running
```

```
DEVLIST=`multipath -ll | grep running | awk '{print $(NF-4)}' ` && echo $DEVLIST

# sday sdba sdbc sdbe sdax sdaz sdbb sdbd
```

```
DEVALIAS=`multipath -ll | grep EMC | awk '{print  class="code bash"}' ` && echo $DEVALIAS
# mpathag mpathaf
```

```
for i in $DEVALIAS; do echo multipath -f /dev/mapper/$i;done | bash
```

```
# multipath -f /dev/mapper/mpathag
# multipath -f /dev/mapper/mpathaf
```

```
for i in $DEVLIST; do echo "echo offline > /sys/block/$i/device/state"; echo "echo 1 >/sys/block/$i
/device/delete" ;done | bash
```

```
# echo offline > /sys/block/sday/device/state
# echo 1 >/sys/block/sday/device/delete
# echo offline > /sys/block/sdba/device/state
# echo 1 >/sys/block/sdba/device/delete
# echo offline > /sys/block/sdbc/device/state
# echo 1 >/sys/block/sdbc/device/delete
# echo offline > /sys/block/sdbe/device/state
# echo 1 >/sys/block/sdbe/device/delete
# echo offline > /sys/block/sdax/device/state
# echo 1 >/sys/block/sdax/device/delete
# echo offline > /sys/block/sdaz/device/state
# echo 1 >/sys/block/sdaz/device/delete
# echo offline > /sys/block/sdbb/device/state
# echo 1 >/sys/block/sdbb/device/delete
# echo offline > /sys/block/sdbd/device/state
# echo 1 >/sys/block/sdbd/device/delete
```

```
multipath -ll
```

Send mail to Catherine Sacre for connect the disk to the VM server (catherine.sacre@ext.publications.europa.eu)

When VM server is created, connect to the Vsphere web interface :

```
https://opvmwsvc060.publications.win/ui/
```

Go to OP / UNIX TEAM / KVM Migration and select the VM

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Power on the VM and open the Web console

Select the Rescue Kernel and connect in SSH

Get the kernel version used by default

```
cat /etc/grub2.cfg | grep linux16 | awk '{print cat /etc/grub2.cfg | grep linux16 | awk '{print $2}' | head -1 /
vmlinuz-3.10.0-693.17.1.el7.x86_64}' | head -1
/vmlinuz-3.10.0-693.17.1.el7.x86_64
```

Build a new initramfs :

```
dracut --force /boot/initramfs-3.10.0-693.17.1.el7.x86_64.img 3.10.0-693.17.1.el7.x86_64
```

reboot the VM and start using the default kernel, ssh to the VM :

Install VMware Tools

```
yum install -y open-vm-tools.x86_64 && systemctl start vmtoolsd.service
```

**REDHAT 6 :**

Get the kernel version used by default

```
cat /boot//grub/grub.conf | egrep "vmlinuz|default" | grep -v "#"

default=0
        kernel /vmlinuz-2.6.32-696.20.1.el6.x86_64 ro root=/dev/mapper/root-slash rd_NO_LUKS  KEYBOARDTYPE=pc
KEYTABLE=uk LANG=en_US.UTF-8 rd_LVM_LV=root/swap rd_NO_MD nofb quiet splash=quiet SYSFONT=latarcyrheb-sun16
rd_LVM_LV=root/slash crashkernel=auto rd_NO_DM rhgb quiet intremap=off elevator=noop transparent_hugepage=always
console=tty0 console=,115200
        kernel /vmlinuz-2.6.32-573.22.1.el6.x86_64 ro root=/dev/mapper/root-slash rd_NO_LUKS  KEYBOARDTYPE=pc
KEYTABLE=uk LANG=en_US.UTF-8 rd_LVM_LV=root/swap rd_NO_MD nofb quiet splash=quiet SYSFONT=latarcyrheb-sun16
rd_LVM_LV=root/slash crashkernel=auto rd_NO_DM rhgb quiet intremap=off elevator=noop transparent_hugepage=always
console=tty0 console=,115200
        kernel /vmlinuz-2.6.32-573.el6.x86_64 ro root=/dev/mapper/root-slash rd_NO_LUKS  KEYBOARDTYPE=pc
KEYTABLE=uk LANG=en_US.UTF-8 rd_LVM_LV=root/swap rd_NO_MD nofb quiet splash=quiet SYSFONT=latarcyrheb-sun16
rd_LVM_LV=root/slash crashkernel=auto rd_NO_DM rhgb quiet intremap=off elevator=noop transparent_hugepage=always
console=tty0 console=,115200
```

If the default is 0, select the first kernel line for get the kernel version and build the dracut command

Build a new initramfs :

```
# if the current kernel is the first one (default=0)

KERNEL=`cat /boot//grub/grub.conf | egrep "vmlinuz|default" | grep -v "#" | awk '/kernel/ {print # if the
current kernel is the first one (default=0)   KERNEL=`cat /boot//grub/grub.conf | egrep "vmlinuz|default" | grep
-v "#" | awk '/kernel/ {print $2;exit}'|cut -d"-" -f2-` && echo "# $KERNEL" IMAGE=/boot/initramfs-${KERNEL}.img
&& echo "# $IMAGE"   dracut --force $IMAGE $KERNEL;exit}'|cut -d"-" -f2-` && echo "# $KERNEL"
IMAGE=/boot/initramfs-${KERNEL}.img && echo "# $IMAGE"

dracut --force $IMAGE $KERNEL
```

reboot the VM and start using the default kernel, ssh to the VM :

Add the CD-Rom device with the Vsphere console

Add drivers CD with the Vsphere console : Action / Guest OS / Install VMware drivers

SSH to the VM :

```
mount /dev/sr0 /media
VMTOOLS=`ls /media/VMware* | awk -F'/' '{print $NF}'` && echo $VMTOOLS
cp /media/$VMTOOLS /tmp/ && cd /tmp/ && tar -xvf /tmp/$VMTOOLS && /tmp/vmware-tools-distrib/vmware-install.pl -d
```

Reboot the server and check installation status :

```
/etc/vmware-tools/services.sh status
```

Remove the CD-Rom device with the Vsphere console

Check puppet modifications:

```
puppet agent -t --noop
```

Check following things :

Mac address

Monitoring (services OK)

Backup

recover

Satellite

yum repolist

Reboot test

Start application

Enable application

Move the VM to the correct directory under VMware (DIGIT)

Remove Source VM:

Remove VM on the cluster

Remove LUNs

Update CMDB