NAME

pvmove - move allocated physical extents from one LVM physical volume to other physical volumes

SYNOPSIS

pvmove Options Supported on Volume Groups 1.0 and Higher

/usr/sbin/pvmove [**-A** *autobackup*] [**-p**] [**-n** *lv_path*] *source_pv_path* [*dest_pv_path* **:***de* | *dest_pv_path* ... | *dest_pvg_name* ...]

/usr/sbin/pvmove [**-A** *autobackup*] [**-p**] *source_pv_path*[**:***se1*[**-***se2*]] [*dest_pv_path* **:***de* | *dest_pv_path* ... | *dest_pvg_name* ...]

/usr/sbin/pvmove [**-A** *autobackup*] [**-p**] [**-e** *no_of_extents*] *source_pv_path* [*dest_pv_path* **:***de* | *dest_pv_path* ... | *dest_pvg_name* ...

pvmove Options Supported on Volume Groups Version 2.0 and Higher

/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a** *vg_name*

/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a** *lv_path* ... [*pv_path* ... | *dest_pvg_name* ...]

/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a -f** *pv_path* ...

DESCRIPTION

The **pvmove** command moves allocated physical extents and the data they contain from a source physical volume, *source_pv_path*, to one or more other physical volumes in the same volume group.

The preview option (**-p**) verifies whether or not the physical extents can be successfully relocated with the specified arguments. It displays the source to destination movement details, but does not perform the actual relocation of physical extents.

A range of allocated physical extents or any single physical extent can be moved by giving a range along with the source physical volume path. Optionally, the destination physical volume and the starting location on the destination physical volume can also be specified.

The **pvdisplay** command (see *pvdisplay*(1M)) can be used to decide on the range of allocated physical extents to be moved from the source physical volume or to identify the starting location on the destination physical volume.

The **-e** option can be used to move the last few physical extents from the source physical volume.

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Note that the **-e** and **-a** options are mutually exclusive. (See *Auto-Rebalance Mode* below for details on the **-a** option.)

The first extent of the physical volume can be moved to create more space for LVM's metadata. On version 1.0 volume groups, the **vgmodify** command can use the extra space created by moving the first extent to expand the metadata. To relocate the first extent, specify **0** after *source_pv_path*, delimited by a colon (**:**).

If a destination physical volume or physical volume group is not specified, all physical volumes in the volume group are available as destination volumes for the transfer. **pvmove** selects the proper physical volumes to be used in order to preserve the allocation policies of the logical volume involved.

To limit the transfer to specific physical volumes, specify the name of each physical volume directly with a *dest_pv_path* argument. Optionally, if physical volume groups are defined for the volume group, specify the physical volumes indirectly with one or more *dest_pvg_name* arguments.

source_pv_path must not appear as a *dest_pv_path* .

If *source_pv_path* is a member of a *dest_pvg_name*, it is automatically excluded from being a destination physical volume.

While moving one or more extents, *src_pv_path* can be part of *dest_pv_path*; and *src_pv_path* is not excluded if it is member of *dest_pvg_name*.

pvmove succeeds only if there is enough space on the destination physical volumes to hold all the allocated extents of the source physical volume. If a range of extents is provided, **pvmove** succeeds only when all the extents within the range provided can be relocated successfully. An error will be returned if any extent within the range could not be relocated.

If you have installed HP MirrorDisk/UX on your system and *source_pv_path* is an "active spare" physical volume within a mirrored logical volume, once all of the data has been moved to *dest_pv_path*, the

source_pv_path physical volume will be returned to a "stand-by" spare physical volume. This is how to "unspare" data once the original failed physical volume has been repaired and is available to receive data.

Auto-Rebalance Mode

For volume group 2.0 and higher, the **pvmove** command provides an **-a** option for performing automatic re-balance of allocated extents for space. In automatic re-balance mode, the relocation of extents is based on the optimal number of extents calculated for each logical volume on each physical volume involved in the automatic re-balance operation.

The optimal number of extents calculated will keep the percentage of free and used space on each involved physical volume equal to the total percentage of free and used space on all the physical volume's that are selected in the automatic re-balance operation.

When invoked in the automatic re-balance mode, the **pvmove** command will try to achieve the optimal count of extents on each physical volume involved in the operation. If the current configuration of the volume group do not allow this, it still proceeds with the distribution of extents staying as close as possible to the optimal count.

Either the whole volume group or one or more logical volumes can be automatically re-balanced across all physical volumes of the volume group using the **-a** option with the **pvmove** command.

A single or multiple logical volumes can be automatically re-balanced across either one or more physical volumes or all physical volumes belonging to the volume group.

Note that when a single or multiple logical volumes are provided, then the automatic re-balance operation will not move extents belonging to other logical volumes in order to balance the extents belonging to the specified logical volumes.

The **-f** option in conjunction with **-a** option can be used to move all the used extents from a single or multiple physical volumes to the remaining physical volumes in the volume group such that the remaining physical volumes are balanced with respect to space utilization.

The following syntax is used to perform automatic re-balance of allocated extents for space within a volume group:

/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a** *vg_name*

The following syntax is used to perform an automatic re-balance of allocated extents for space belonging to one or more logical volumes either within a volume group or across one or more physical volumes, or one or more physical volume groups (PVG):

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/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a** *lv_path* ... [*pv_path* ... | *dest_pvg_name*...]

This last syntax is used to free up one or more physical volumes in a volume group by keeping the remaining volume group space balanced:

/usr/sbin/pvmove [**-A** *autobackup*] [**-p** [**-s**]] **-a -f** *pv_path* ...

Bootable PV Considerations

The **pvmove** command supports moving boot physical volumes, and the resulting (destination) physical volumes are bootable.

However, please note that when auto-rebalance (**pvmove -a**) is run on bootable physical volumes, the logical volumes for root, boot, swap, and dump are not moved/rebalanced; therefore it ensures that the system is still bootable after a rebalance.

Shared Volume Group Considerations

For volume group version 1.0 **pvmove** is not supported if the volume group is activated in shared mode. For volume groups version 2.0 and higher, **pvmove** can be performed on volume groups activated in either shared or unshared mode.

The **lvmpud** daemon must be running on all the nodes sharing a volume group actived in shared mode. See *lvmpud*(1M).

LMV shared mode is currently only available in Serviceguard clusters.

Snapshot Volume Considerations

Note that for volume group version 2.2 or higher, **pvmove** is disallowed in share mode if it has snapshots associated with it.

Also, automatic re-balance is disallowed if the physical volume(s) have pre-allocated extents associated with them, for snapshots in group volume version 2.2 or higher.

See *lvm*(7) for more information on snapshot volumes.

Options and Arguments

pvmove recognizes the following options and arguments:

dest_pv_path Specifies the block device path name of a physical volume. It cannot be the source physical volume. It must be in the same volume group as *source_pv_path*.

dest_pvg_name Specifies the name of a physical volume group. It must be in the same volume group as *source_pv_path*.

For volume group version 2.0 and higher, a physical volume group can be provided along with the **-a** option, only when one or more logical volumes is specified. Also, the physical volume group must be in the same volume group where the logical volume resides.

de The starting location of the destination physical extents within a destination physical volume. If this starting location is provided along with the *dest_pv_path* , then the source physical extents are re-allocated to the destination physical volume starting from this location.

The **pvmove** command fails with an error if the requested number of extents for relocation on the destination physical volume are not available contiguously starting from this location.

lv_path Specifies the block device path name of a logical volume.

pv_path Specifies the block device path name of a physical volume.

se1[*-se2*] The source physical extent range. If the extent range is provided along with *source_pv_path*, then the extents from *se1* to *se2* are moved out of the source physical volume. A single extent can also be provided, specified by only *se1* instead of the extent range.

source_pv_path The block device path name of a physical volume.

vg_name Specifies the path name of a volume group.

-a Performs the requested **pvmove** operation in automatic re-balance mode.

-a *vg_name* Performs an automatic re-balance of allocated extents within a volume group.

-a *lv_path* [*pv_path*...]
Performs an automatic re-balance of allocated extents within a volume group for the specified logical volumes. If *pv_path* is also specified along with **-a** *lv_path*, then the automatic re-balance for the logical volume is performed only across the specified physical volumes.

-A *autobackup* Set automatic backup for this invocation of this command. *autobackup* can have one of the following values:

y Automatically back up configuration changes made to the physical volume. This is the default.

After this command executes, the **vgcfgbackup** command (see *vgcfgbackup*(1M)) is executed for the volume group to which the physical volume belongs.

n Do not back up configuration changes this time.

-e *no_of_extents* Moves the last few extents specified by *no_of_extents* from the source physical volume.

This option should not be used in conjunction with the **-n** option or when source physical extent range is provided, specified by *se1*[**-***se2*}.

This option cannot be used when **-a** option is specified.

-f *pv_path* Moves the allocated physical extents from the specified physical volumes to the remaining physical volumes in the volume group such that the remaining

physical volumes are balanced with respect to space. This option can only be used in conjunction with **-a** option.

-n *lv_path* Move only the physical extents allocated to the logical volume specified by *lv_path* that are located on the source physical volume, specified by *source_pv_path*.

-p Preview the source to destination physical extent movements, without performing the actual relocation. Any intermediate operation on the volume group under consideration after the preview operation may invalidate the preview result.

-s Summary option. This option can only be used in conjunction with **-p** and **-a** options. This option displays a summary report for the requested auto rebalance operation.

For Volume group version 2.0 and higher, when **-s** option is used with **-a** and **-p** option, pvmove displays only the summary report for the requested automatic re-balance operation.

If the **-a** and **-p** option are used without the **-s** option, then both the summary report and source to destination movement details will be displayed.

EXTERNAL INFLUENCES

Environment Variables

LANG determines the language in which messages are displayed.

If **LANG** is not specified or is null, it defaults to "C" (see *lang*(5)).

If any internationalization variable contains an invalid setting, all internationalization variables default to "C" (see *environ*(5)).

EXAMPLES

Display the physical extent movement details from **/dev/dsk/c1t0d0** to **/dev/dsk/c3t0d0** without an actual relocation of extents (preview mode):

```
pvmove -p /dev/dsk/c1t0d0 /dev/dsk/c3t0d0
```

Move physical extents from **/dev/dsk/c1t0d0** to **/dev/dsk/c2t0d0** and **/dev/dsk/c3t0d0**:

```
pvmove /dev/dsk/c1t0d0 /dev/dsk/c2t0d0 /dev/dsk/c3t0d0
```

If physical volumes **/dev/dsk/c2t0d0** and **/dev/dsk/c3t0d0** are the only ones that belong to physical volume group **PVG0**, the same result can be achieved with the following command:

```
pvmove /dev/dsk/c1t0d0 PVG0
```

Move only the physical extents for logical volume **/dev/vg01/lvol2** that are currently on **/dev/dsk/c1t0d0** to **/dev/dsk/c2t0d0**:

```
pvmove -n /dev/vg01/lvol2 /dev/dsk/c1t0d0 /dev/dsk/c2t0d0
```

Relocate PE number 0 to any free extent with in the same physical volume:

```
pvmove /dev/dsk/c1t0d0:0 /dev/dsk/c1t0d0
```

Relocate PE number 0 from **/dev/dsk/c1t0d0** to any free extent in the volume group:

```
pvmove /dev/dsk/c1t0d0:0
```

Move physical extents 25 to 100 from **/dev/dsk/c1t0d0** to **/dev/dsk/c2t0d0**:

```
pvmove /dev/dsk/c1t0d0:25-100 /dev/dsk/c2t0d0
```

Move physical extents 25 to 100 from **/dev/dsk/c1t0d0** to **/dev/dsk/c2t0d0** beginning from the physical extent 102:

```
pvmove /dev/dsk/c1t0d0:25-100 /dev/dsk/c2t0d0:102
```

Relocate the last few physical extent from **/dev/dsk/c1t0d0** to any free extents in the volume group:

```
pvmove -e 2 /dev/dsk/c1t0d0
```

Relocate any single physical extent (for example physical extent 5) from **/dev/dsk/c1t0d0** to **/dev/dsk/c2t0d0**:

```
pvmove /dev/dsk/c1t0d0:5 /dev/dsk/c2t0d0
```

Display the summary report for the automatic re-balance operation within a volume group **/dev/vg03**:

```
pvmove -p -s -a /dev/vg03
```

Perform an automatic re-balance of allocated extents within a volume group **/dev/vg03**:

```
pvmove -a /dev/vg03
```

Perform an automatic re-balance of allocated extents within a volume group **/dev/vg03** for two logical volumes say **/dev/vg03/lvol1** and **/dev/vg03/lvol2**:

```
pvmove -a /dev/vg03/lvol1 /dev/vg03/lvol2
```

Perform an automatic re-balance of allocated extents for space across two physical volumes **/dev/disk/disk10** and **/dev/disk/disk11**, for two logical volumes **/dev/vg03/lvol1** and **/dev/vg03/lvol2** belonging to volume group **/dev/vg03**:

```
pvmove -a /dev/vg03/lvol1 /dev/vg03/lvol2 /dev/disk/disk10
/dev/disk/disk11
```

Relocate all the used extents from **/dev/disk/disk10** to the remaining physical volumes of a volume group **/dev/vg03** by keeping the remaining volume group space balanced:

```
pvmove -a -f /dev/disk/disk10
```

Perform an automatic re-balance of allocated extents within a volume group **/dev/vg03** for a logical volumes say **/dev/vg03/lvol1** across two physical volume groups **pvg1** and **pvg2:**

```
pvmove -a /dev/vg03/lvol1 pvg1 pvg2
```

Logical volume allocation policy will prevent Automatic Re-balancing when we try to perform an Re-balance of allocated extents within a Volume Group **/dev/vg03** which has two Physical Volumes say **/dev/disk/disk10, /dev/disk/disk11** and two Logical Volumes out of which **/dev/vg03/lvol1** is having a contiguous allocation policy placed on the **/dev/disk/disk10** and other Logical Volume **/dev/vg03/lvol2**
having one mirror copy with strict allocation policy placed on **/dev/disk/disk10** and /dev/disk/disk11:

```
pvmove -a /dev/vg03
```

The **/dev/vg03** with insufficient contiguous free extents will prevent the Automatic Re-balancing when we try to relocate all the used extents from **/dev/disk/disk10** which includes the contiguous Logical Volume to the remaining Physical Volumes of a Volume Group **/dev/vg03** which is not having sufficient contiguous free space to accommodate all the extents of **/dev/disk/disk10:**

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```
pvmove -a -f /dev/disk/disk10
```

The **/dev/vg03** with insufficient free extents will prevent the Automatic Re-balancing when we try to perform an Re-balance of allocated extents for space across two Physical Volumes **/dev/disk/disk10** and **/dev/disk/disk11,** for two Logical Volumes in that one Logical volume **/dev/vg03/lvol1** having contiguous allocation policy and other logical volume **/dev/vg03/lvol2** having default allocation policy belonging to Volume Group **/dev/vg03:**

```
pvmove -a /dev/vg03/lvol1 /dev/vg03/lvol2 /dev/disk/disk10
/dev/disk/disk11
```

SEE ALSO

pvdisplay(1M), vgcfgbackup(1M), intro(7), lvm(7).

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