NetBSD libdevmapper library

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Talk outline

• Introduce NetBSD LVM implementation
• Introduce NetBSD libdm as library used for communication with device-mapper driver
• Some interesting info from development
• Give usage examples
• Q&A
Introduction

• Missing major feature of a server OS
  - Linux, Aix, HP-UX, Solaris, FreeBSD has it
• Available disk space is growing
  - 3-4 terabytes in a common server
• Number of disks in a server is much higher then it used to be
Logical Volume Manager design

- Physical Volume
- Physical Volume
- Physical Volume
- Physical Volume

Volume Group

- Logical Volume
- Logical Volume
- Logical Volume
- Logical Volume
Details

• Physical Volume is placed on a disk partition or whole disk and it’s used as backing device.

• Volume Group is a pool of available disk space from which virtual partitions can be created.

• Logical volumes are virtual partitions, which are allocated from Volume Group and physically placed on a Physical Volume.
NetBSD LVM

- Done during Google Summer of Code 2008
- Enabled by default from 2009, will be part of 6.0 release.

LVM contains

- Simple BSD licensed kernel driver which maps real disk blocks to virtual ones
  - driver is called device-mapper
- Linux lvm tools which manage LVM metadata.
NetBSD LVM architecture
Initial
NetBSD LVM architecture with libdm
NetBSD libdm

• Libdm library creates another level of indirection for lvm tools which they use to access netbsd device-mapper

• Hides any differences between linux and netbsd device-mapper

• Can be used by other tools and because it’s BSD licensed can be built to /rescue directory

• With libdm NetBSD can utilize device-mapper for different tasks
NetBSD libdm

• Possible use cases
  • Use device-mapper as replacement for ccd and cgd drivers which are old and unmaintained
  • Write new HAST like driver for device-mapper which can be used to mirror disk devices through network.
Libdmd + dm usage examples

• Replacement for ccd and cgd drivers

• dm driver needs way ho to support different ioctl calls then NETBSD_DM_IOCTL every driver uses different cmd.

• I have patch to implement support for this in dm driver.
Developing lessons

• During libdm development I have been doing test with RUMP. Which is way how to build most of NetBSD kernel as userspace library and load it to process.

• RUMP allows easy testing, because it just require to load rump build device mapper driver to test binary and run it.

• For RUMP info see

  • http://www.netbsd.org/docs/rump/index.html
Questions & Answers

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