Linux Device Mapper

A Visual Guide

I/O Stack • DM Architecture • dm-linear & dm-stripe • dm-crypt & LUKS
dm-verity & Merkle Trees • Thin Provisioning • Advanced Targets • Stacking Patterns

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Understanding how Linux remaps, encrypts, and verifies block I/O

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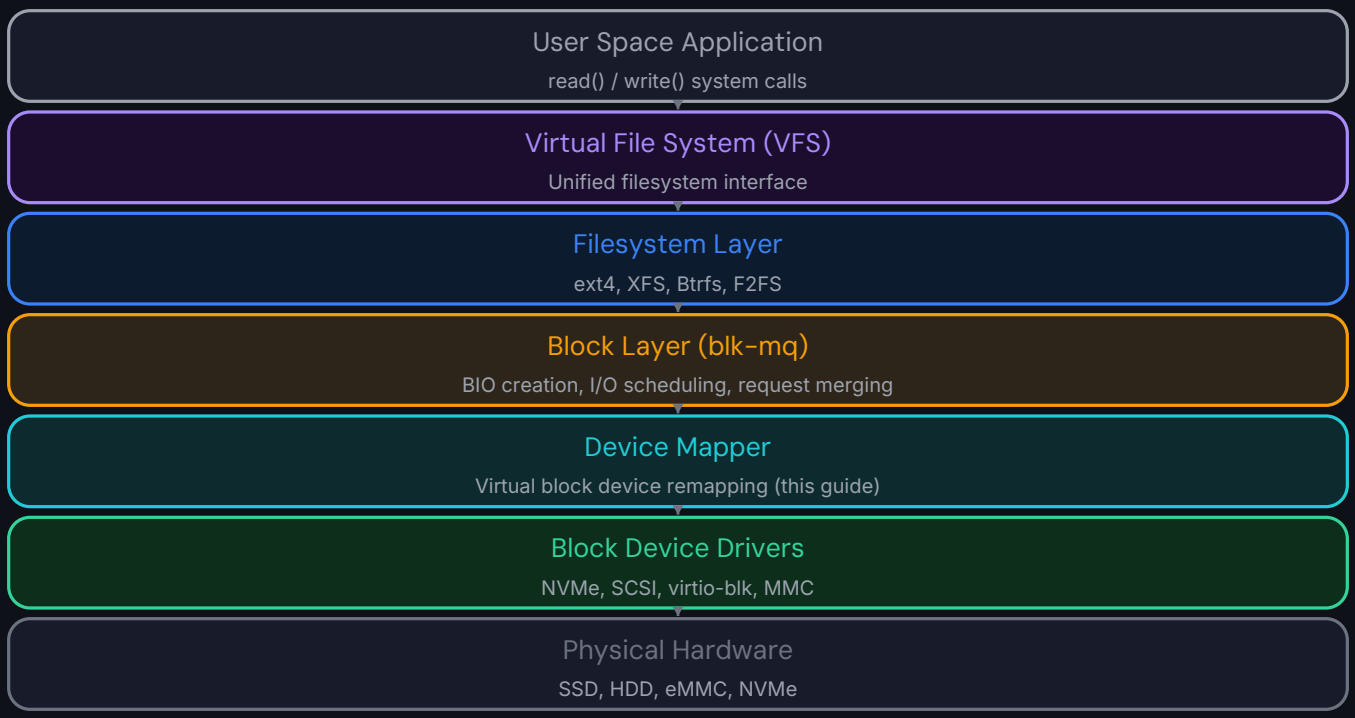
01 Prerequisites & I/O Stack

What you need to know before diving in

Before exploring Device Mapper, you should be familiar with:

* Block devices (/dev/sda, /dev/nvme0n1) and partitions
* Linux kernel modules and kernel vs. user space
* Filesystem basics (ext4, XFS, read/write operations)
* Basic cryptography (hashing, symmetric encryption)

Linux I/O Stack



Key Concept

> Device Mapper sits between the block layer and device drivers
> It intercepts BIOs (Block I/O) and remaps them to different devices
> All DM operations are transparent to filesystems above