IoT: Client Devices

AXFS

Background

Developed by Jared Hulbert

- Originally at Intel, now at Numonyx, released in 2008

Designed for XIP

- Execution-in-place, very handy for mobile/embedded
- Not integrated into Linux kernel well
- Clumsy patch for XIP in common use with CRAMFS

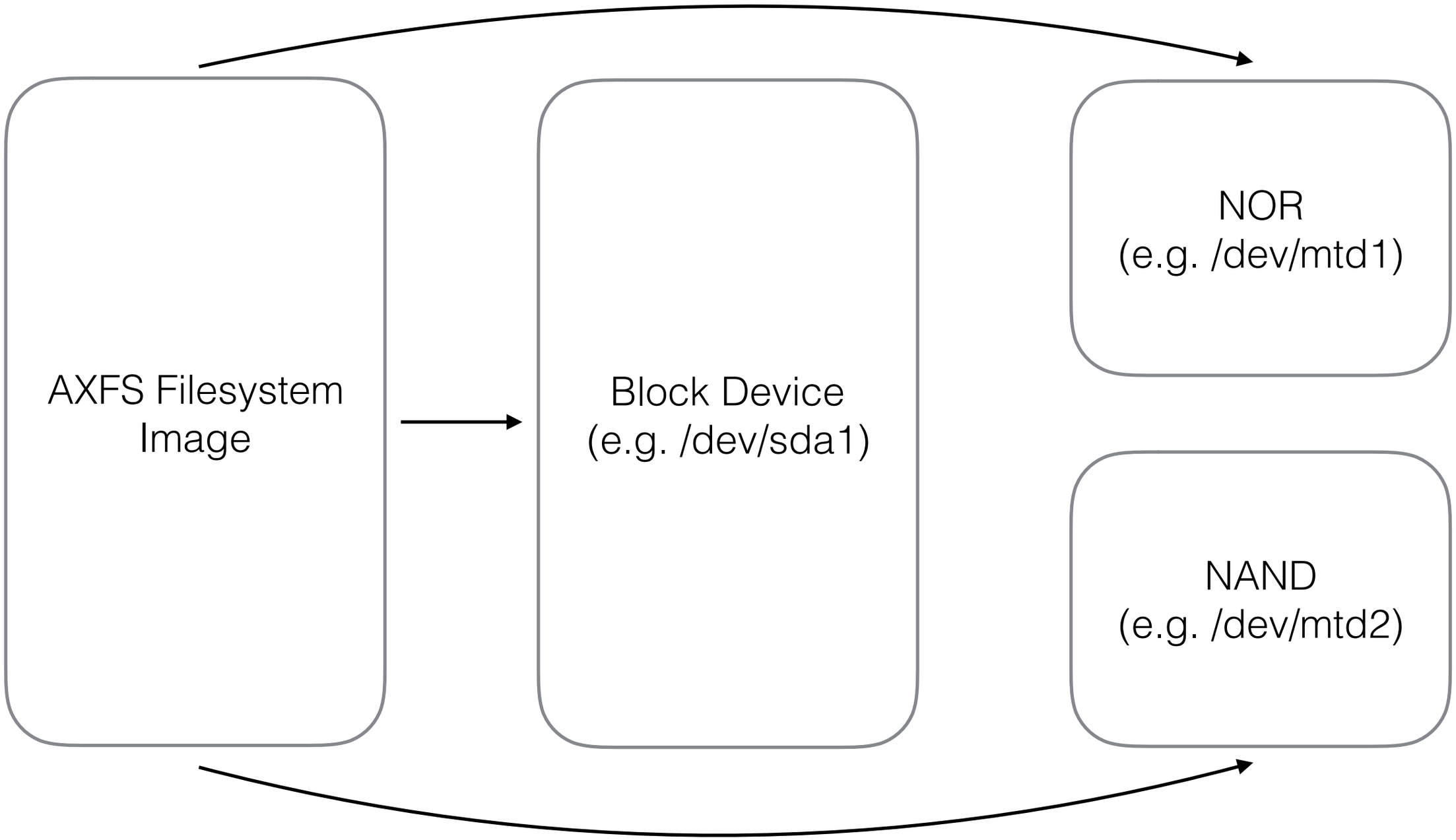
Flash and XIP

So why XIP?

- Mobile and embedded systems are not desktop
- Flash memory is fast, disk is slow
- Running programs directly from Flash is possible
- Saves space, speeds up loading

Obstacles

- Program loading is remarkably different
  - Shared libraries, code relocation, other dynamic loading



Design - Mounting

Split Mounting

NOR: XIP Programs **NAND**: Media Storage

Superblock
Volume information and offsets to region descriptors

1 ↓ 1..*

Region Descriptor
Contains an offset to a region, compression info, region size

1 ↓ 1..*

Region
ByteTable or data nodes (XIP, compressed, or byte aligned)

Design - Data

(See Hulbert's *Introducing the Advanced XIP File System* for more details)