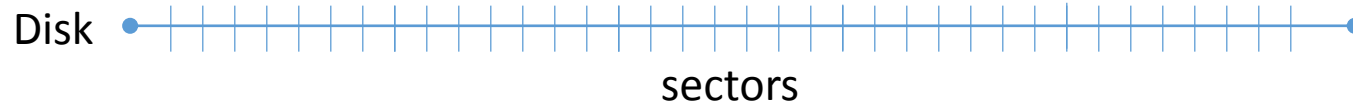
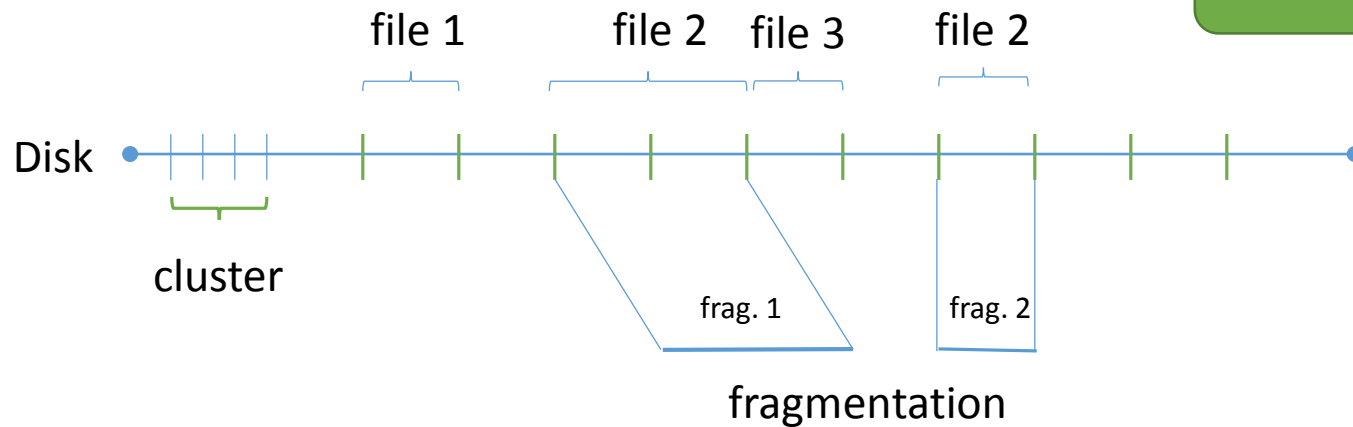


File Storage Basics

sector – minimum unit for a disk



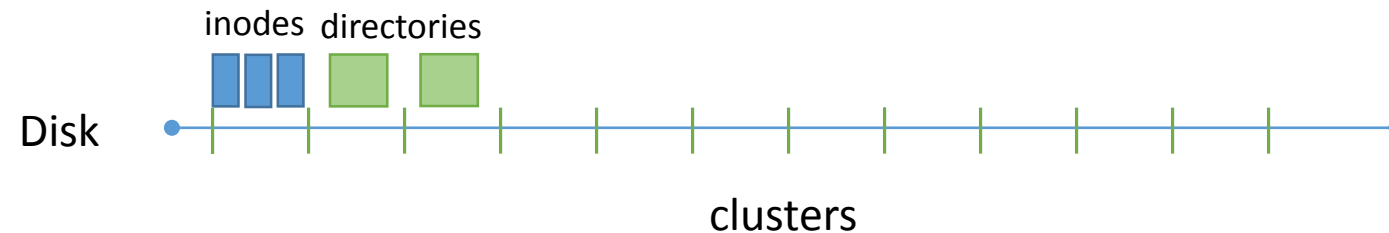
cluster – minimum unit for a filesystem



File Storage Basics

File metadata:

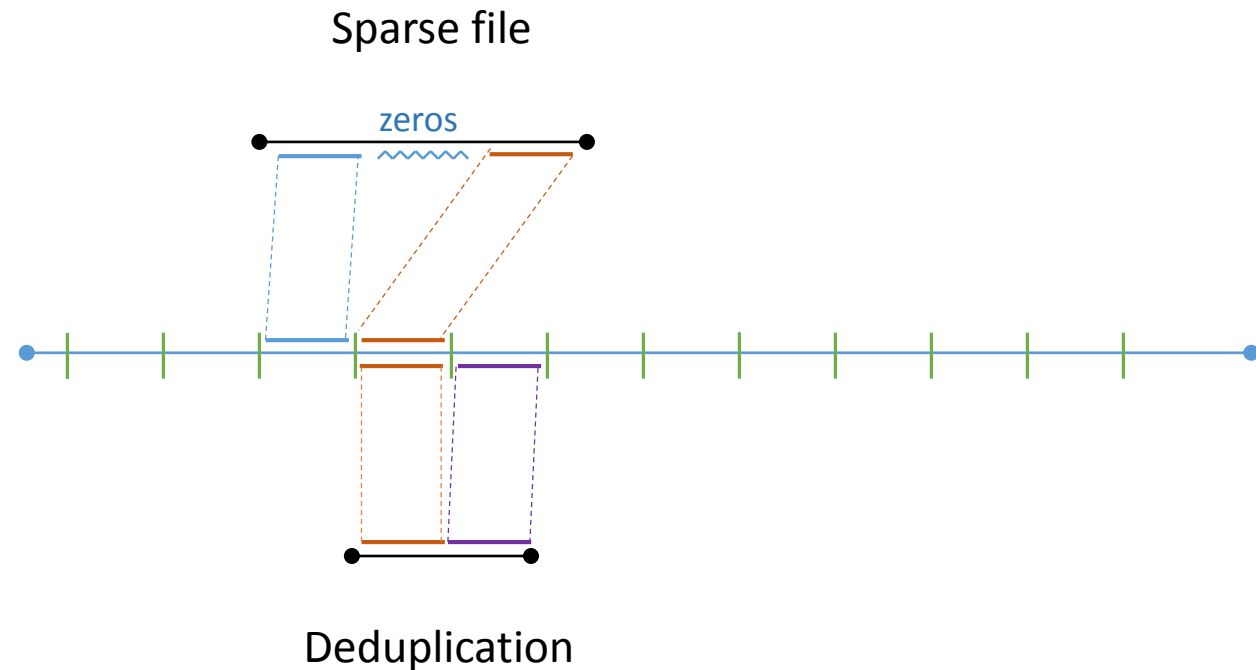
- file size
 - content location
 - date and time of creation
 - access rights
 - ...
 - file name
- } often stored in inode
- } often stored in directory



File Storage Basics

Filesystem features:

- Sparse files
- Built-in compression
- Built-in deduplication
- Journaling
(intention logging)
- Copy-on-write (CoW)
- Checksums



Fragmentation, sparse storage, compression, and deduplication make carving impossible

Journaling and copy-on-write provide additional data for recovery