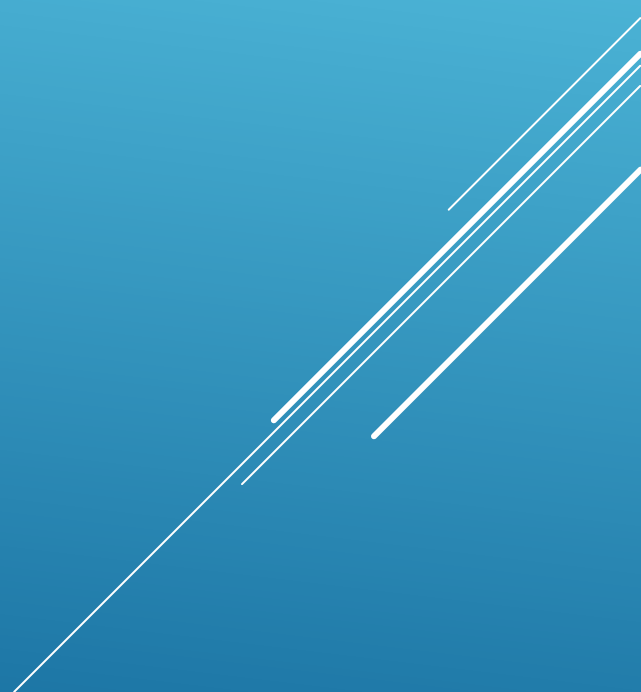
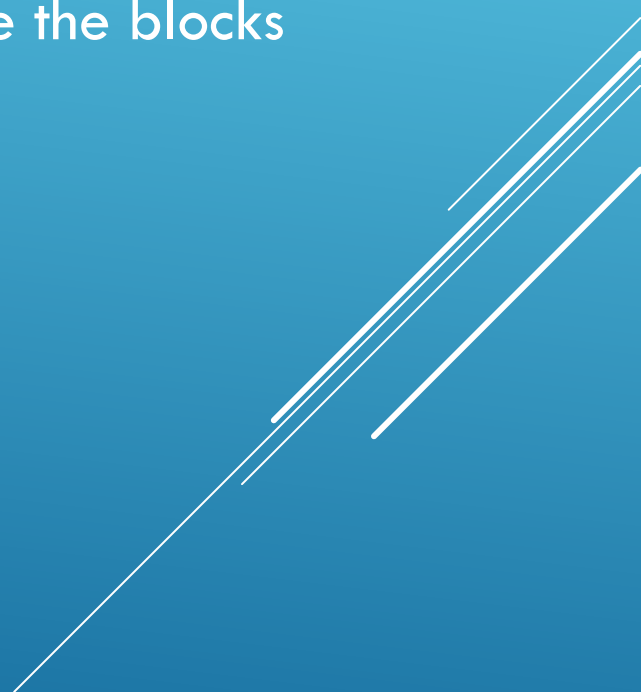


# FILESYSTEM SHRINK

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# WHAT IS FILE SYSTEM SHRINK?

- Shrink reduces physical space of the file system on disk.
  - Requires a potentially intensive reconstruction of how and where the blocks are allocated.
  - Requires significant developer effort to implement
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# SHRINK IN XFS AND EXT4

- Shrink is currently unsupported in XFS.
  - Ext4 has offline shrink, and a proposed lazy online shrink.
  - Both efforts still in development.
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# XFS SHRINK WORKAROUND

- Current workaround is to create a new, smaller file system, copy the data, and remove the larger one.
  - Requires enough space for both file systems.
  - Could add a feature to mkfs to simplify this process.
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# FSTRIM ON THIN PROVISIONED VOLUMES

- Fstrim releases unallocated space within the file system
  - Does not move or shrink existing allocations.
  - Requires thin provisioning to reclaim unused blocks
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.


# PROTOFILE, ANOTHER WORKAROUND

- Proto files are used to auto generate a root file system.
  - This can be used to generate a small root fs, and avoid needing to shrink.
  - Maybe useful for the case of root fs creations.
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# HOW MUCH SPACE IS NEEDED


- How much do users need to shrink a file system?
  - If we need to shrink a lot, might need more complex features
    - rmap
    - parent pointers
- 

# ERROR REPORTING AND STATFS

- Shrink can disk usage reporting issues with statfs.
  - Need to limit new user block allocations while shrink in progress
  - Operations may “fail” as though the disk were full
- 



# OTHER FEATURES FOR SHRINK

- Other features could facilitate shrink:
    - Reflink
    - reverse mapping
    - parent pointers.
  - Could reduce time/operations/dev effort needed
  - Some of the features are still under development.
- 

# QUESTIONS TO THINK ABOUT

- What are your use cases for shrink with XFS/EXT4?
  - Clone util for mkfs?
  - Thin provisioning with fstrim an option?
  - Proto files for root fs creation?
  - By how much do you need to shrink?
  - Care about statfs issues during shrink?
- 