

ORACLE

Oracle Automatic Storage Management (ASM)

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ASM History 101

Simple idea for addressing the complexity of storage management for the Oracle Database

Manages storage as a
global cluster of shared
Disk Groups

Stripe and mirror files
across disks in ASM Disk
groups

Automatic rebalances
after storage
configuration changes

Built on reliable Oracle
instance architecture

I/O operations DO not go
through the ASM instance

Provide an integrated
Cluster Volume manager

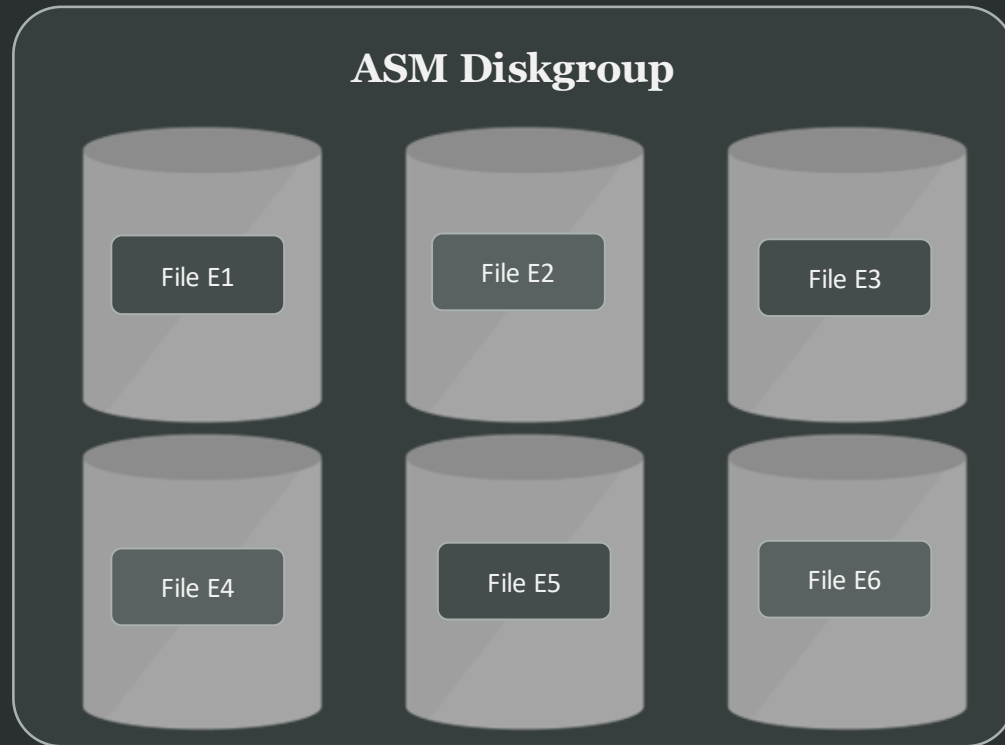
ACFS extends the ASM
management for non-
database data

ASM along with ACFS
define the Oracle storage
stack

Oracle ASM versus host-based alternatives

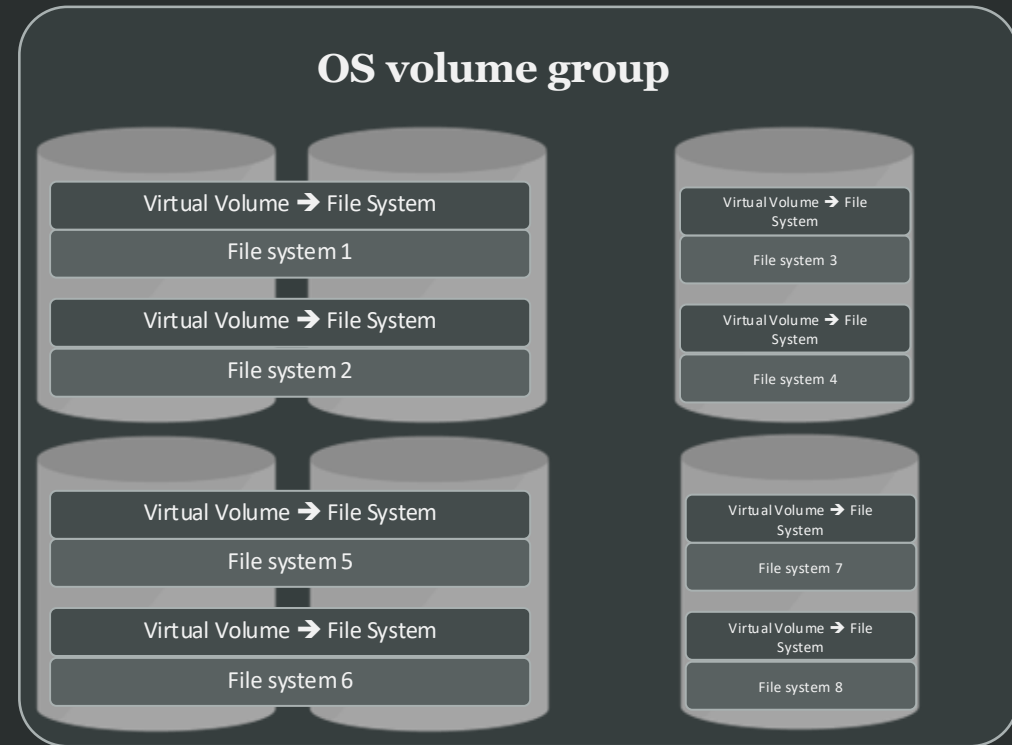
One shared storage view versus many per-database mount points

ASM



All Database files are striped and mirrored automatically across all ASM disks.

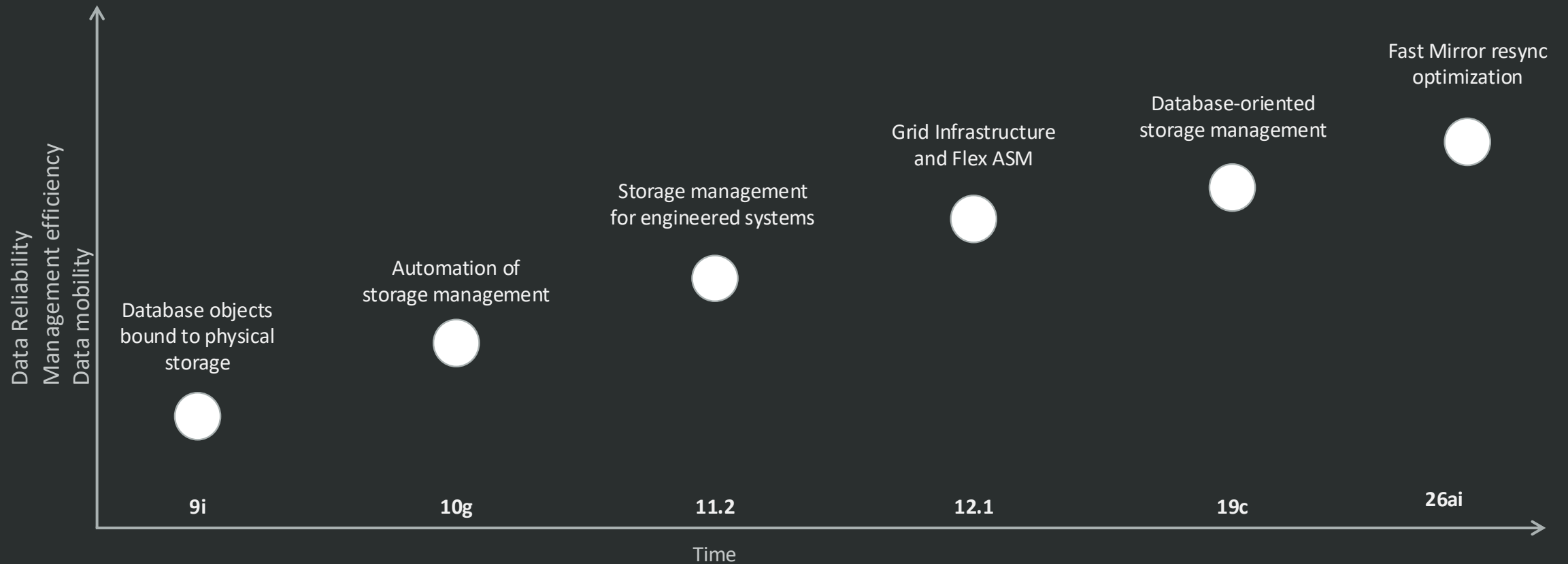
Host-based LVM /File System



Individual file mounts are created for each database, Organizations may manage hundreds or thousands of file systems and virtual volumes to manage

Evolution of the Oracle storage stack

Efficient storage management for mission-critical databases



Flex ASM

Since Oracle 12c, Eliminates the requirement for an ASM instance on every server



- Database instances connect to any ASM instance in the cluster
- Database instances can failover to a secondary ASM instance
- Administrators specify the cardinality of ASM instances (default is 3)
- Clusterware ensures ASM cardinality is maintained

ASM Storage Pool

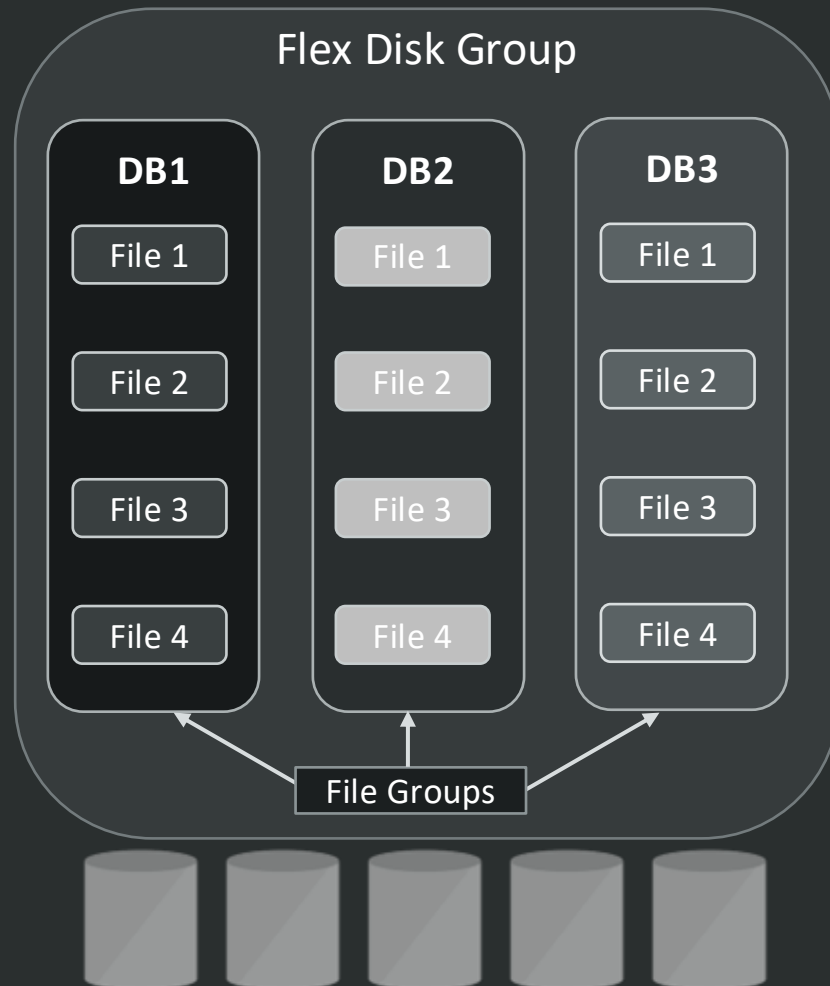
Disk group A

Disk group B



Database-oriented Storage Management

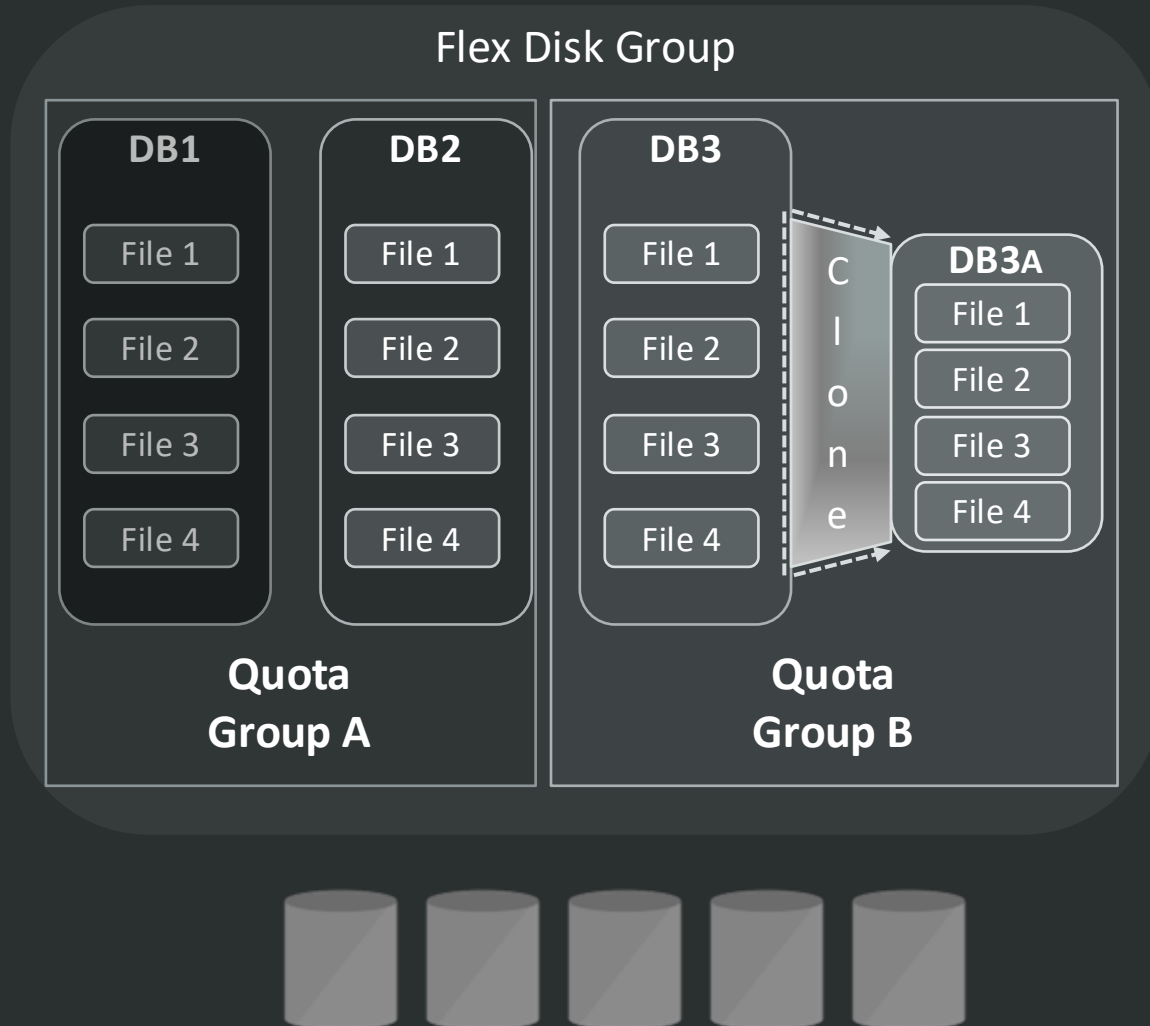
Flex Diskgroup



- New Flex Diskgroups provide File Groups
- A file group is the collection of files belonging to individual databases or PDBs
- A file groups name defaults to the database name or PDB name

ASM File Groups Flexibility and Availability

Flex Diskgroup quota management

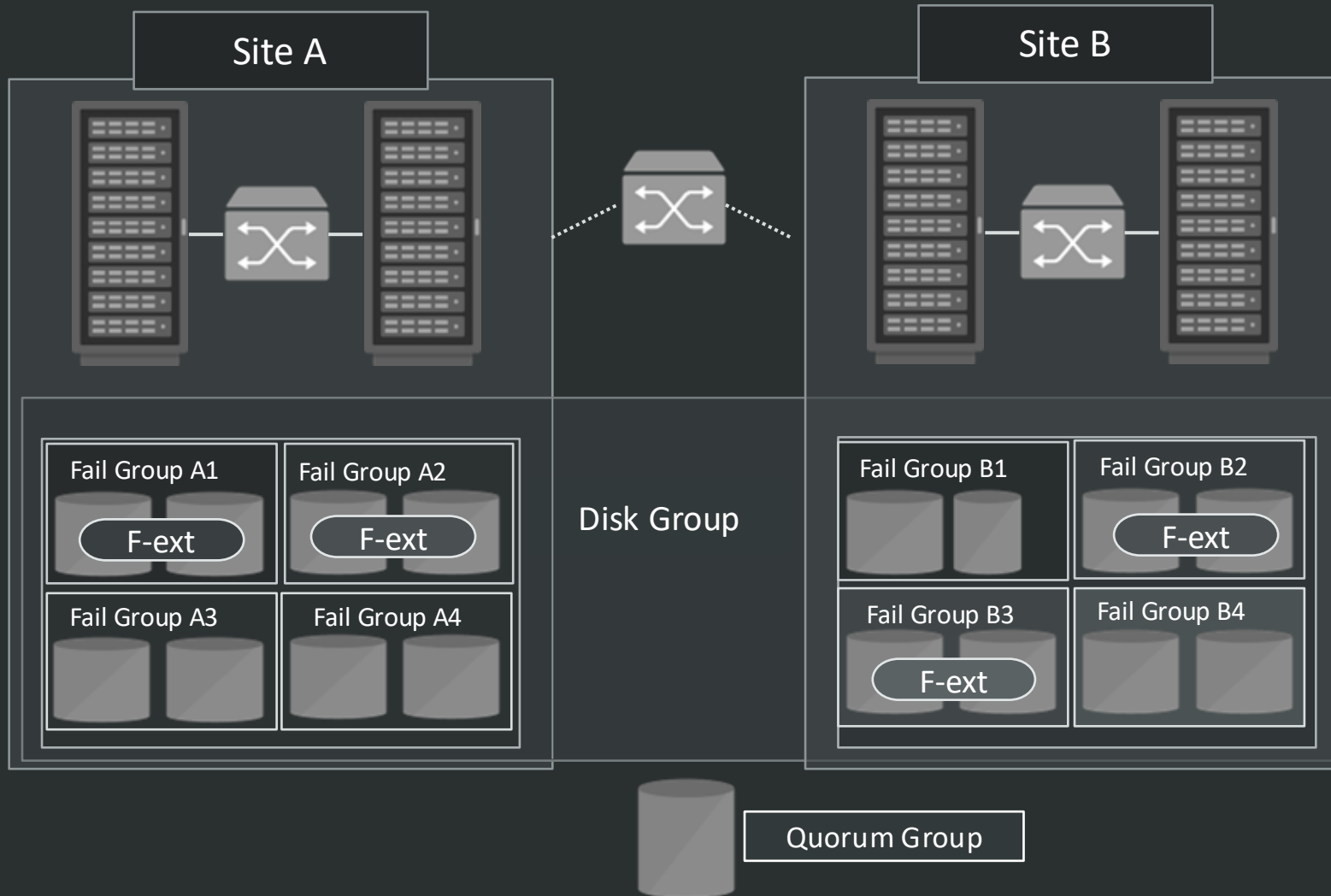


Flex Diskgroups enable

- Quota Management - limit the space databases can allocate in a diskgroup and thereby improve the customers' ability to consolidate databases into fewer DGs
- Redundancy Change – utilize lower redundancy for less critical databases
- ASM Database Clones to easily and dynamically create database clones for test/dev or production databases

Oracle RAC on Extended Clusters

Extreme Availability



- New Diskgroup type: Extended Diskgroup
 - Multiple FGs per site
 - Support for 3 Sites
 - Survive loss of Failure Group
 - Survive loss of site
 - Supports Exadata
- Built on Flex ASM
 - Flex Diskgroups

Key Benefits of Oracle ASM

1

Simplifies Oracle Database Storage Management

2

Implements Stripe and Mirror Everything

3

Available on all platforms, optimized for Engineered Systems

4

Scrubbing capabilities by diskgroup, file or extent