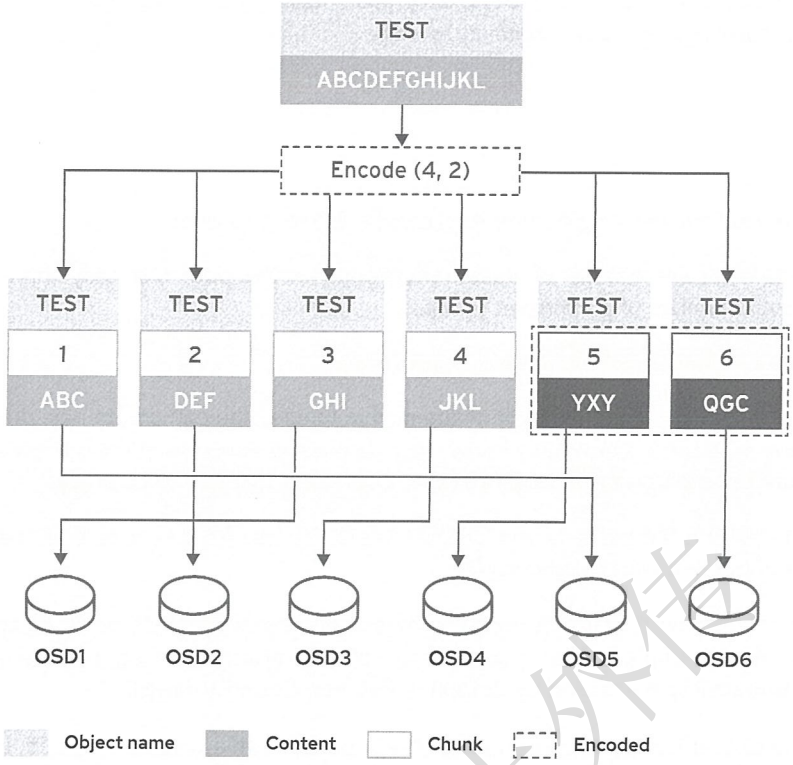

Figure 4.4: Erasure coded pools

Erasure coding uses storage capacity more efficiently than replication. Replicated pools maintain n copies of an object, whereas erasure coding maintains only k + m chunks. For example, replicated pools with 3 copies use 3 times the storage space. Erasure coded pools with k=4 and m=2 use only 1.5 times the storage space.

Note

Red Hat supports the following k+m values which result in the corresponding usable-to-raw ratio:

- **4+2** (1:1.5 ratio)
- **8+3** (1:1.375 ratio)
- **8+4** (1:1.5 ratio)

The formula for calculating the erasure code overhead is `nOSD * k / (k+m) * OSD Size`. For example, if you have 64 OSDs of 4 TB each (256 TB total), with k=8 and m=4, then the formula is 64 * 8 / (8+4) * 4 = 170.67. Then divide the raw storage capacity by the overhead to get the ratio. 256 TB/170.67 TB equals a ratio of 1.5.

Erasure coded pools require less storage than replicated pools to obtain a similar level of data protection, which can reduce the cost and size of the storage cluster. However, calculating coding chunks adds CPU processing and memory overhead for erasure coded pools, reducing overall performance.

Use the following command to create an erasure coded pool.