# JOURNAL CONFIG REFERENCE

Ceph OSDs use a journal for two reasons: speed and consistency.

- **Speed:** The journal enables the OSD to commit small writes quickly. Ceph writes small, random i/o to the journal sequentially, which tends to speed up bursty workloads by allowing the backing filesystem more time to coalesce writes. The OSD journal, however, can lead to spiky performance with short spurts of high-speed writes followed by periods without any write progress as the filesystem catches up to the journal.
- **Consistency:** Ceph OSDs require a filesystem interface that guarantees atomic compound operations. Ceph OSDs write a description of the operation to the journal and apply the operation to the filesystem. This enables atomic updates to an object (for example, placement group metadata). Every few seconds–between `filestore max sync interval` and `filestore min sync interval`–the OSD stops writes and synchronizes the journal with the filesystem, allowing OSDs to trim operations from the journal and reuse the space. On failure, OSDs replay the journal starting after the last synchronization operation.

Ceph OSDs support the following journal settings:

`journal dio`

| | |
|---|---|
| **Description:** | Enables direct i/o to the journal. Requires `journal block align` set to `true`. |
| **Type:** | Boolean |
| **Required:** | Yes when using aio. |
| **Default:** | `true` |

`journal aio`

| | |
|---|---|
| **Description:** | Enables using `libaio` for asynchronous writes to the journal. Requires `journal dio` set to `true`. |
| **Type:** | Boolean |
| **Required:** | No. |
| **Default:** | `false` |

`journal block align`

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|---|---|
| **Description:** | Block aligns writes. Required for `dio` and `aio`. |
| **Type:** | Boolean |
| **Required:** | Yes when using `dio` and `aio`. |
| **Default:** | `true` |

`journal max write bytes`

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|---|---|
| **Description:** | The maximum number of bytes the journal will write at any one time. |
| **Type:** | Integer |
| **Required:** | No |
| **Default:** | `10 << 20` |

`journal max write entries`

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|---|---|
| **Description:** | The maximum number of entries the journal will write at any one time. |
| **Type:** | Integer |
| **Required:** | No |
| **Default:** | `100` |

`journal queue max ops`

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|---|---|
| **Description:** | The maximum number of operations allowed in the queue at any one time. |
| **Type:** | Integer |
| **Required:** | No |
| **Default:** | `500` |

`journal queue max bytes`

| | |
|---|---|
| **Description:** | The maximum number of bytes allowed in the queue at any one time. |
| **Type:** | Integer |

**Required:** No
**Default:** 10 << 20

journal align min size

    **Description:** Align data payloads greater than the specified minimum.
    **Type:** Integer
    **Required:** No
    **Default:** 64 << 10

journal zero on create

    **Description:** Causes the file store to overwrite the entire journal with 0's during mkfs.
    **Type:** Boolean
    **Required:** No
    **Default:** false