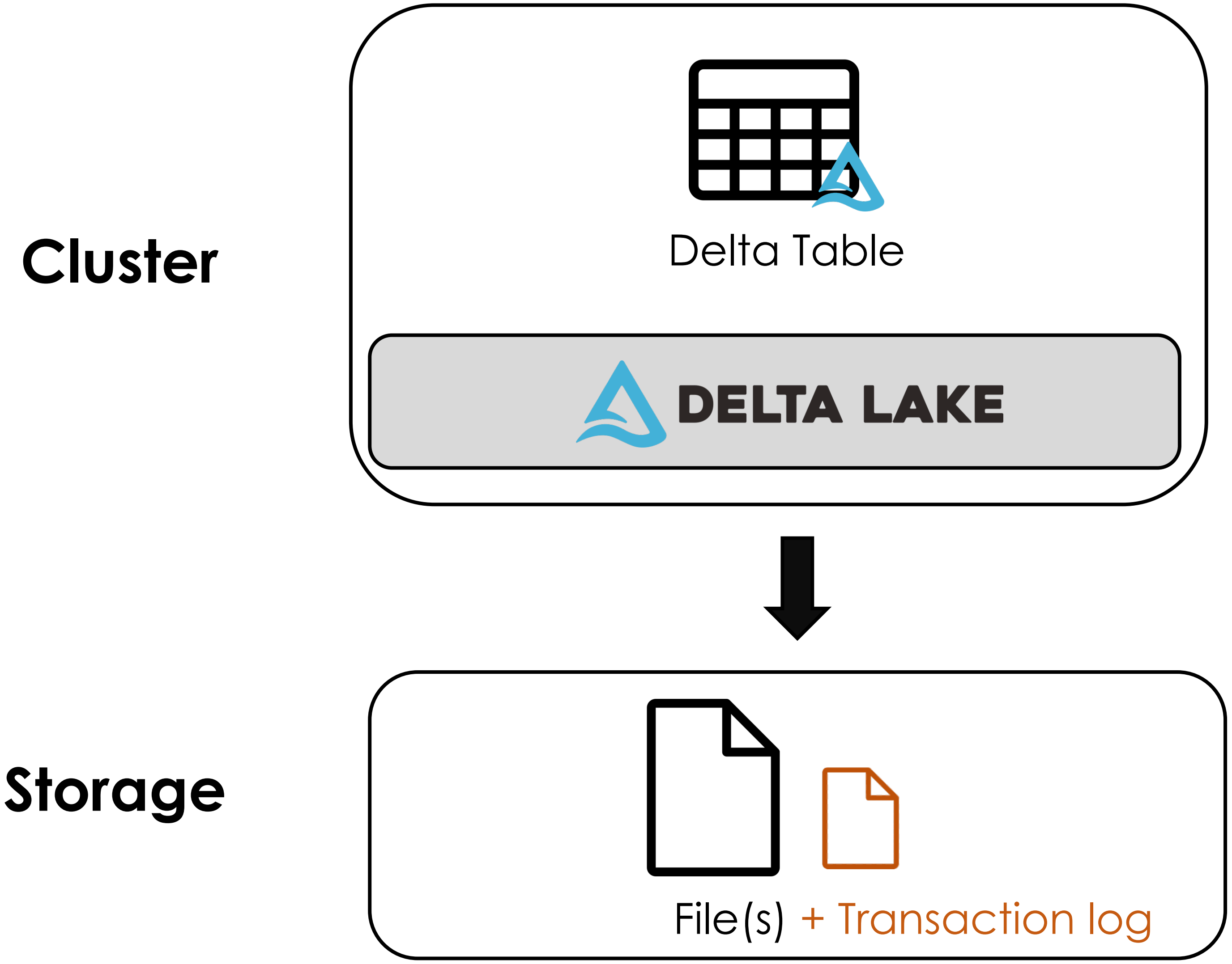
Delta Lake

Delta Lake

- Open-source storage framework that brings reliability to data lakes

Delta Lake is/is not

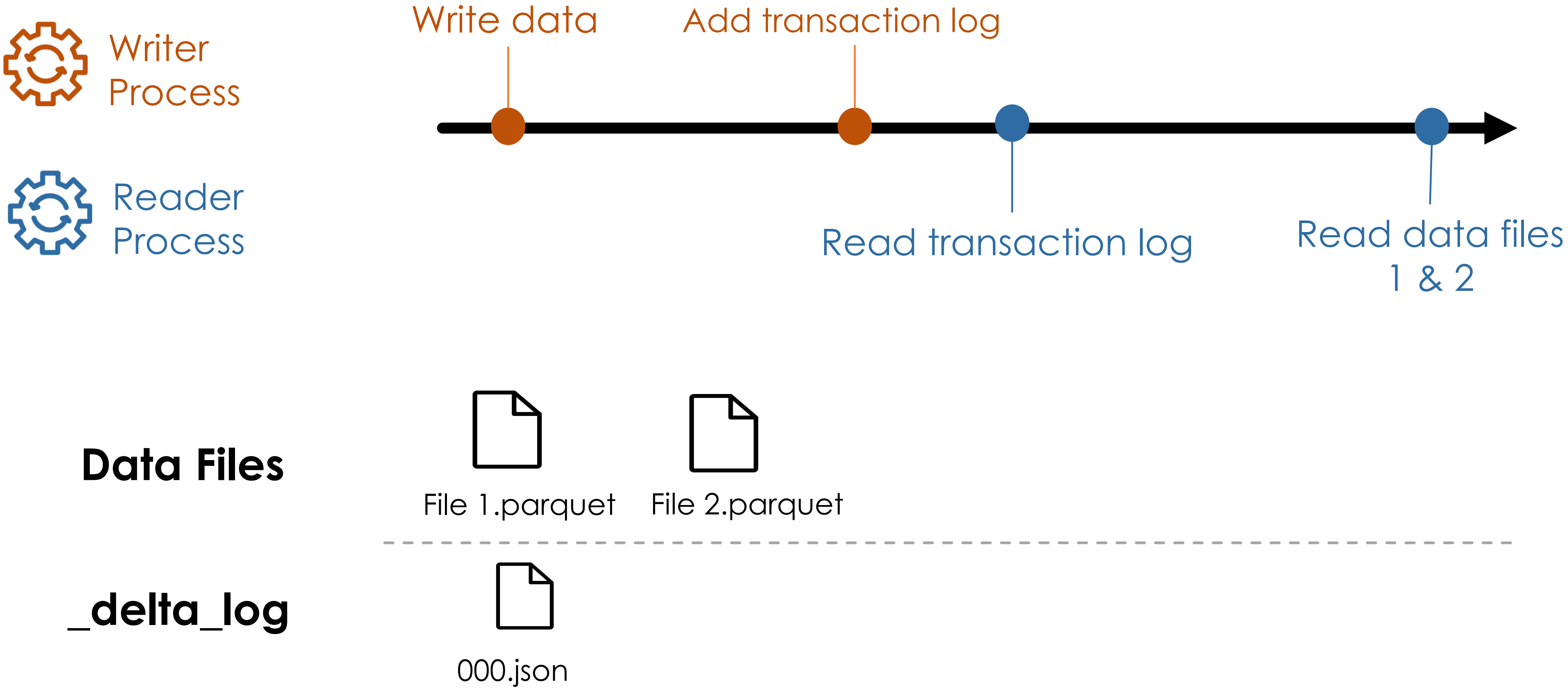
Is	Is Not
Open-source technology	Proprietary technology
Storage framework/layer	Storage format/medium
Enabling building Lakehouse	Data warehouse/Database service


Cluster
Delta Table
DELTA LAKE
Storage
File(s)
+ Transaction log

Transaction log (Delta log)

- Ordered records of every transaction performed on the table
- Single Source of Truth
- JSON file contains commit information:
    - Operation performed + Predicates used
    - data files affected (added/removed)

Writes/Reads



Writer Process

Reader Process

Write data

Add transaction log

Read transaction log

Read data files 1 & 2

Data Files

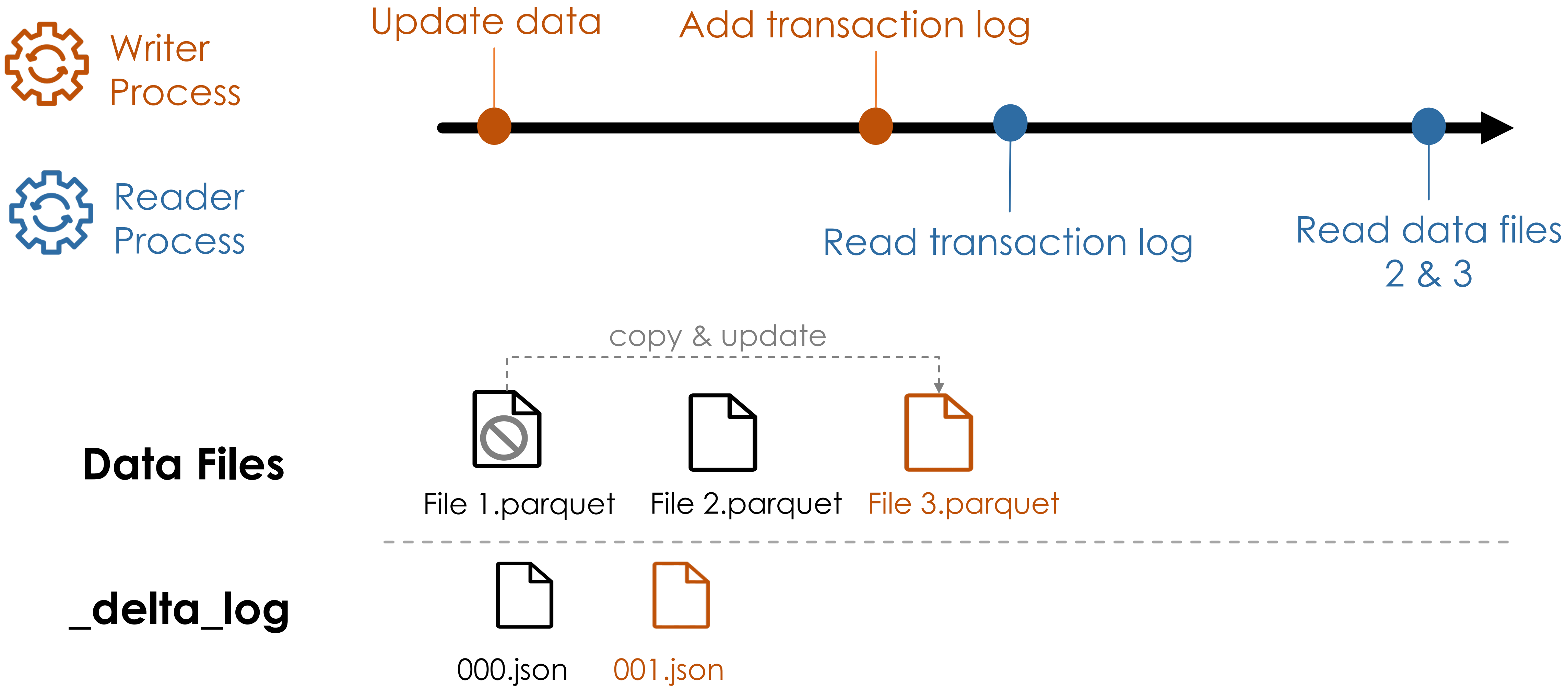
File 1.parquet

File 2.parquet

_delta_log

000.json

Updates



Writer Process

Reader Process

Update data

Add transaction log

Read transaction log

Read data files 2 & 3

copy & update

Data Files

File 1.parquet

File 2.parquet

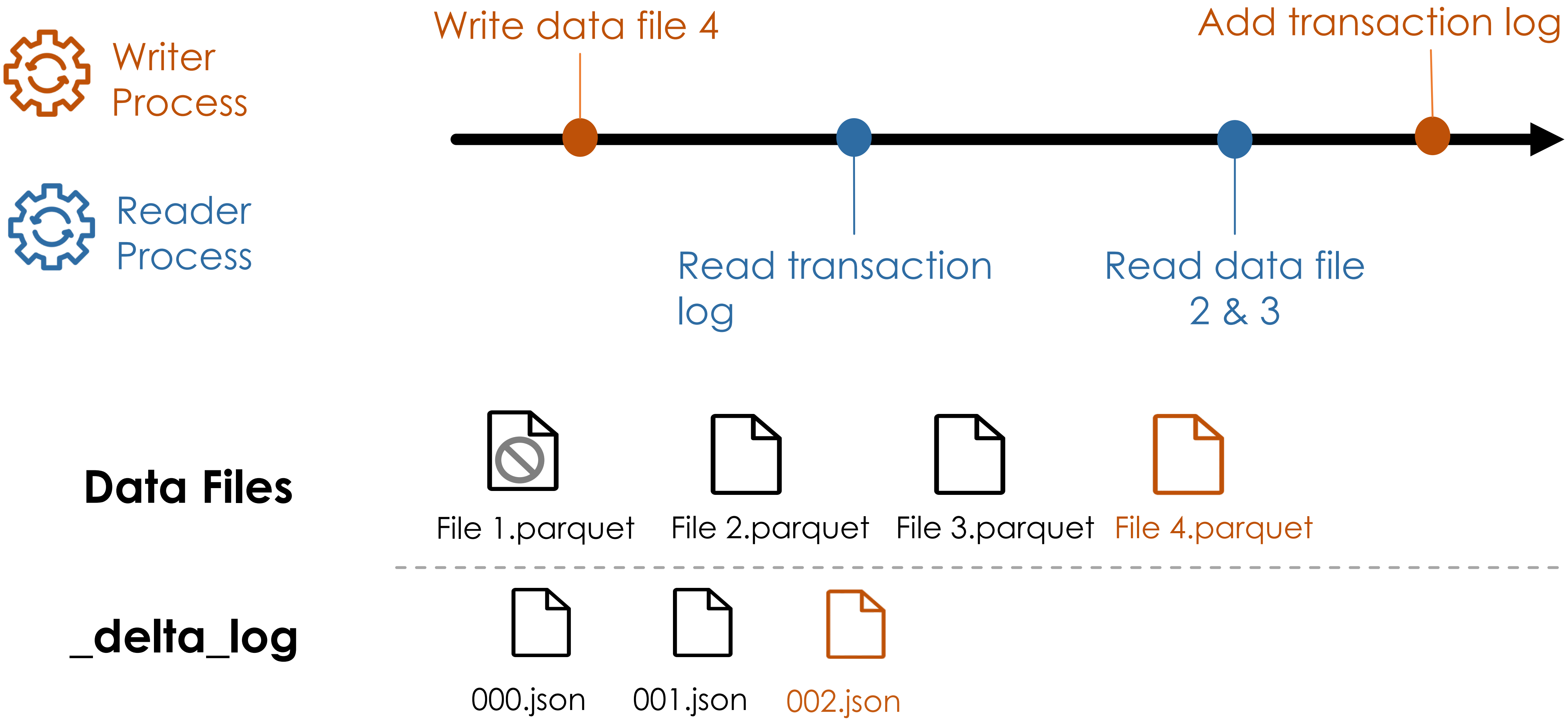
File 3.parquet

_delta_log

000.json

001.json

Simultaneous Writes/Reads



Writer Process

Reader Process

Write data file 4

Read transaction log

Read data file 2 & 3

Add transaction log

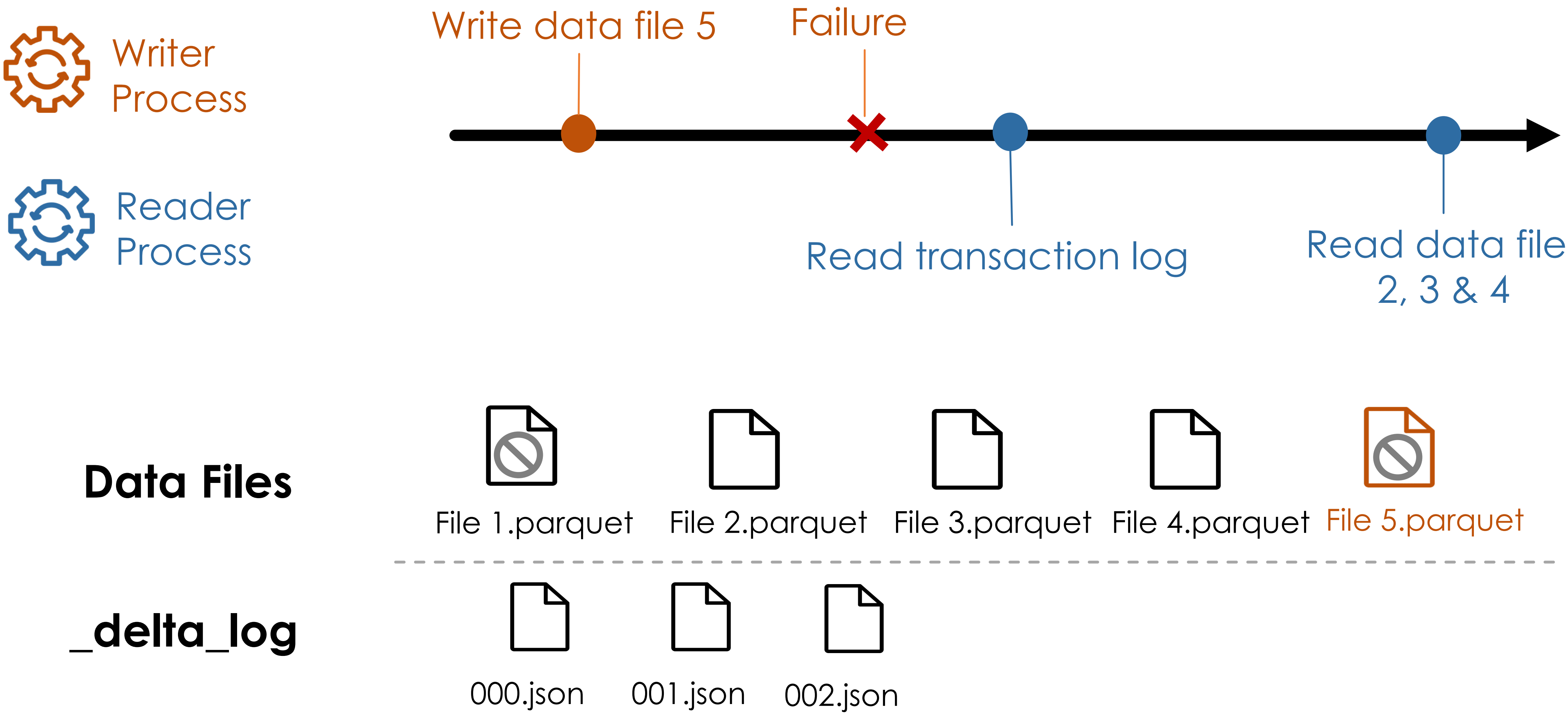
Data Files

File 1.parquet File 2.parquet File 3.parquet File 4.parquet

_delta_log

000.json 001.json 002.json

Failed Writes



Writer Process

Reader Process

Write data file 5

Failure

Read transaction log

Read data files 2, 3 & 4

Data Files

File 1.parquet

File 2.parquet

File 3.parquet

File 4.parquet

File 5.parquet

_delta_log

000.json

001.json

002.json

Delta Lake Advantages

- Brings ACID transactions to object storage
- Handle scalable metadata
- Full audit trail of all changes
- Builds upon standard data formats: Parquet + Json