Apache ORC is the smallest, fastest columnar storage for Hadoop workloads.

• Includes support for ACID transactions and snapshot isolation.

• Built-in Indexes including minimum, maximum, and bloom filters for each column.

• Supports all of Hive's complex types including the compound types: structs, lists, maps, and unions.

ORC is a self-describing type-aware columnar file format designed for Hadoop workloads. It is optimized for large streaming reads, but with integrated support for finding required rows quickly. Storing data in a columnar format lets the reader read, decompress, and process only the values that are required for the current query. Because ORC files are type-aware, the writer chooses the most appropriate encoding for the type and builds an internal index as the file is written.

Predicate pushdown uses those indexes to determine which stripes in a file need to be read for a particular query and the row indexes can narrow the search to a particular set of 10,000 rows. ORC supports the complete set of types in Hive, including the complex types: structs, lists, maps, and unions.

Many large Hadoop users have adopted ORC. For instance, Facebook uses ORC to save tens of petabytes in their data warehouse and demonstrated that ORC is significantly faster than RC File or Parquet. Yahoo uses ORC to store their production data and has released some of their benchmark results.

ORC files are divided in to *stripes* that are roughly 64MB by default. The stripes in a file are independent of each other and form the natural unit of distributed work. Within each stripe, the columns are separated from each other so the reader can read just the columns that are required.

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