## **Streaming Queries**

1. output sink: Output format, location
2. output mode: Specify what gets written to the output sink.
3. trigger interval
4. checkpoint location: For some output sinks where the end-to-end fault-tolerance can be guaranteed, specify the location where the system will write all the checkpoint information. This should be a directory in an HDFS-compatible fault-tolerant file system. The semantics of checkpointing is discussed in more detail in the next section.
5. *Query name*

#### ***Output Modes***

* ***Append mode (default)*** *- This is the default mode, where only the new rows added to the Result Table since the last trigger will be outputted to the sink. This is supported for only those queries where rows added to the Result Table is never going to change. Hence, this mode guarantees that each row will be output only once (assuming fault-tolerant sink). For example, queries with only select, where, map, flatMap, filter, join, etc. will support Append mode.*
* ***Complete mode*** *- The whole Result Table will be outputted to the sink after every trigger. This is supported for aggregation queries.*
* ***Update mode*** *- (Available since Spark 2.1.1) Only the rows in the Result Table that were updated since the last trigger will be outputted to the sink. More information to be added in future releases.*

#### ***Output Sinks***

* ***File sink*** *- Stores the output to a directory.*
* ***Kafka sink*** *- Stores the output to one or more topics in Kafka.*
* ***Foreach sink*** *- Runs arbitrary computation on the records in the output. See later in the section for more details.*
* ***Console sink (for debugging)*** *- Prints the output to the console/stdout every time there is a trigger. Both, Append and Complete output modes, are supported. This should be used for debugging purposes on low data volumes as the entire output is collected and stored in the driver’s memory after every trigger.*
* ***Memory sink (for debugging)*** *- The output is stored in memory as an in-memory table. Both, Append and Complete output modes, are supported. This should be used for debugging purposes on low data volumes as the entire output is collected and stored in the driver’s memory. Hence, use it with caution.*