



Tricks of the Trade

To be a
Apache Spark
Rock Star

Overview

- What does it mean to be a rock Star
- Tricks
 - Trick 1: Debug on Local
 - Trick 2: Unit Test
 - Trick 3: Confirmation and Trouble shooting at scale
 - Trick 3: Command B
 - Trick 4: Nested
 - Trick 5: Windowing
 - Trick 6: Big and Small
 - Trick 7: Skew
 - Trick 8: Map vs MapPartition
 - Trick 9: Multi Treading
 - Trick 10: Long live applications
 - Trick 11: SQL vs code
 - Trick 12: SQL optimizations

Definition: Rock Star

- Productive
- Efficient
- Flexible

Trick 1

Debugging

Debugging

- Local Demo

Trick 2

Unit Tests

Unit Tests

- Local Demo
- Spark Github pointers

Trick 3

Confirmation and Trouble shooting at scale

Confirmation and Trouble shooting at scale

- N Mod Logging
- Understand partition details
- Write batch level stats to external storage for reporting
- Stage Isolation

Trick 4

Command B

Command B

- Local Demo

Trick 4

Nested

Nested

- Nested
 - {
 - "group": "A",
 - "time": 5,
 - "value": 3,
 - "nested": [{
 - "col1": 0.1,
 - "col2": 0.2
 - },
 - {
 - "col1": 1.1,
 - "col2": 1.2
 - }
-]}

De-normalized

User_id	Age	St_dt	Catageory	Watch_id	Watch_st_dt	Watch_end_dt	Watch_movie_id
4201	42	12/12/12	Normal	101	12/13/12	12/13/12	201
4201	42	12/12/12	Normal	102	12/14/12	12/14/12	202
4201	42	12/12/12	Normal	103	12/15/12	12/15/12	203
4201	42	12/12/12	Normal	104	12/16/12	12/16/12	204
4202	64	12/1/15	Normal	105	12/13/16	12/13/12	201
4202	64	12/1/15	Normal	106	12/13/16	12/13/12	202

Nested

User_id	Age	St_dt	Catageory	Watch_id	Watch_st_dt	Watch_end_dt	Watch_movie_id
4201	42	12/12/12	Normal	101	12/13/12	12/13/12	201
				102	12/14/12	12/14/12	202
				103	12/15/12	12/15/12	203
				104	12/16/12	12/16/12	204
4202	64	12/1/15	Normal	105	12/13/16	12/13/12	201
				106	12/13/16	12/13/12	202

Nested

- Live Demo

Trick 5

Windowing

Windowing

- Think about pikes and valleys
- There is big windows and small windows

Windowing

- Small windowing
 - Group by key
 - Sort and process a window in memory in a task

Windowing

- Big windowing
 - We need to break up a window
 - Time range is the easiest
 - Sampling heuristic is second best.
 - Send edges twice
 - How to identify edges
 - Fix intervals is easy
 - Other wise
 - Guess
 - Or map side reduce by key will do

Trick 6

Big and Small

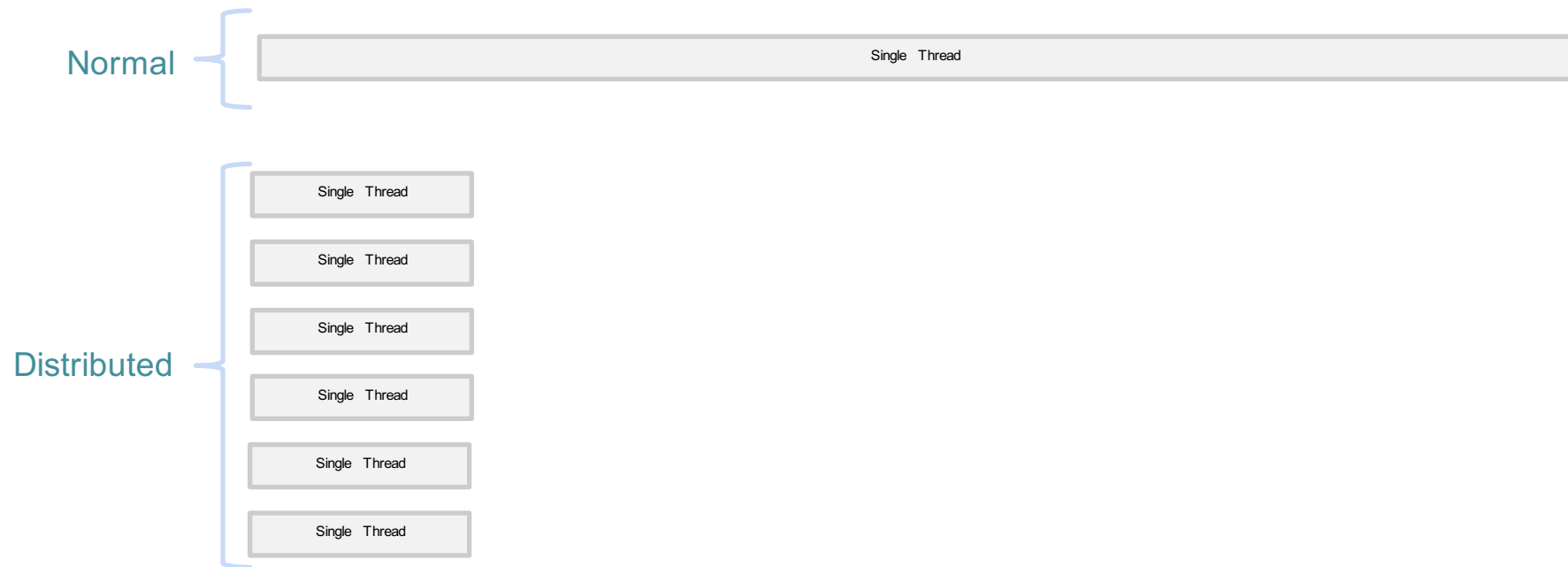
Big and Small

- SQL and Spark Code are thinking about the big
- Break up the problem

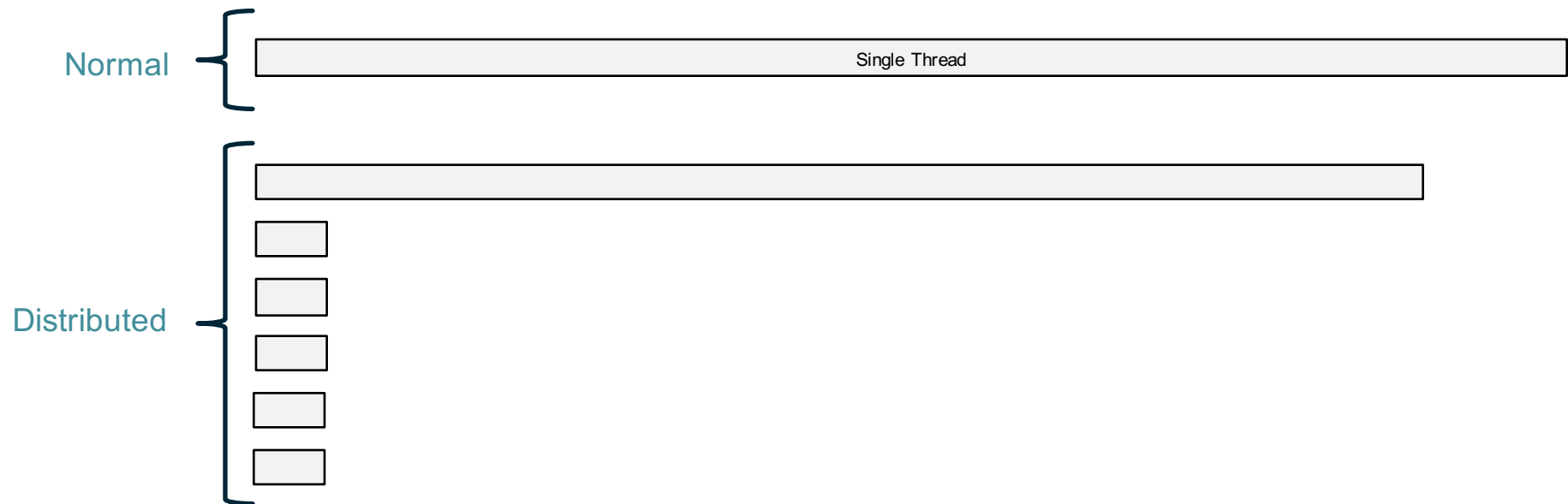
Trick 7

Skew

Skew is Bad



Skew is Bad



Skew is Bad

- Reduce by key
- Salting
 - Think about a skewed join
 - Double send the smaller larger tables
 - And fork the larger table
 - What is a salt
 - Key: Bob
 - Key: Bob001
- Add more keys to the join

Trick 8

Map vs MapPartition

Map vs MapPartition

- One iterators and one gives an iterator
- What can you do with a
 - DoBefore
 - DoAfter

Trick 9

Multi Threading

Multi Threading

- When you hit a action things happen
- Solutions
 - Overload a DAG
 - Add more threads in the driver
- Careful
 - Don't write to the same locations

Trick 10

Long Lived Applications

Long Lived Applications

- Spark Streaming is one example
- Think about a Compactions Service
- Think about a service that releases work loads
- Possible to increase over all multi concurrency

Trick 11

SQL vs Code

SQL vs Code

- In general SQL will be faster than hand written code
- However
 - Debugability
 - Complexity
 - 5 minutes rule of thumb
 - The big and small

Trick 12

SQL optimization

SQL Optimization

- SQL explain plan
 - EXPLAIN EXTENDED
 - .explain
- Know your joins
 - Shuffle Joins
 - Broadcast Joins
 - Bucketed Sorted Merge Joins
- Know you SQL configs
 - spark.sql.files.maxPartitionBytes
 - spark.sql.broadcastTimeout
 - spark.sql.autoBroadcastJoinThreshold
 - spark.sql.shuffle.partitions



Thank You.

Contact information or call to action goes here.