Towards a Big Data Debugger in Apache Spark

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Tuning Spark Applications

• Commonly through visualization tools
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• Commonly through visualization tools
  – Timeline view of Spark events

Taken from https://databricks.com/blog/2015/06/22/understanding-your-spark-application-through-visualization.html
Tuning Spark Applications

• Commonly through visualization tools
  – Execution DAG

Taken from https://databricks.com/blog/2015/06/22/understanding-your-spark-application-through-visualization.html
Tuning Spark Applications

• Commonly through visualization tools
  – Visualization of Spark Streaming statistics

Taken from https://databricks.com/blog/2015/06/22/understanding-your-spark-application-through-visualization.html
“I would like to understand the flow of control through the Spark source code on the worker nodes when I submit my application ... I am assuming I should setup Spark on Eclipse ... to enable stepping through Spark source code on the worker nodes.”
After 5 months, still no good answers!

Add the relevant spark jars to the eclipse project. And then set the master in the code. And now you can run and debug the code for your application.

Have you tried passing remote debug parameters to worker JVM? I think it's something like `spark-submit --master <master> --driver-class-path <path> --conf spark.jre.memory.max=512M --conf spark.jre.heap.size=128M` and then you should be able to connect to remote worker JVM.

You could run the Spark application in local mode if you just need to debug the logic of your transformations. This can be run in your IDE and you'll be able to debug like any other application:

When you run a spark application on yarn, there is an option like this:

```
YARN_OPTS="-agentlib:jdwp=transport=dt_socket,server=y,suspend=n,address=5455 $YARN_OPTS"
```

You can add it to `yarn-env.sh` and remote debugging will be available via port 5455.

If you use Spark in standalone mode, I believe this can help:

```
export SPARK_JAVA_OPTS="-agentlib:jdwp=transport=dt_socket,server=y,suspend=n,address=5005"
```

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Cleb  1,510  2  12  24  user3504158  1
Towards Interactive Debugging for Apache Spark

**Goal:** Develop “debugging toolkits” on Apache Spark where features operate at scale and impose minimal overheads on (normal) program execution

- Data provenance similar to databases but without going to offline
- Traditional debugging features: Breakpoints; Watchpoints; Stepping
- Record-level error/exception handling: Crash culprit; Outlier identification
- Execution replay: On input or intermediate data; Leading to a given result e.g., outlier, crash culprit

**Titian Library:** Provides capture and interactive analysis of data provenance

- Data Provenance supported by enabling record-level tracing in Spark’s dataflow
  - Provenance recorded as data records are pipelined through transformations
  - Provenance exposed to the programmer as Resilient Distributed Datasets (RDDs) for analysis
- Following on work: Breakpoints, Watchpoints and Stepping is under submission to ICSE 2016.

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