

FusionReactor Webinar: Troubleshooting Database Performance Issues with FusionReactor

INTERGRAL
information solutions

 fusion
reactor™

Introductions



Charlie Arehart

Independent Consultant, CArehart.org

(Focused on server troubleshooting)

Agenda

- Foreword
- The many JDBC activities monitored by FR
- JDBC activity displayed in FR UI, as well as FR alerts, reports, logs, Cloud
- FR JDBC activity configurability
- Addressing DB performance problems found
- When other DB monitoring may be necessary
- Analyzing JDBC log data in Excel
- Resources for learning more
- Questions & answers

Foreword

- Audience: presumed to already be using FR
 - May not realize there's any such JDBC monitoring
 - Or may not realize how much is available
- Concepts apply generally to any Java/CFML server that FR can monitor
- Preso is being recorded, so you will be able to revisit details

The Many JDBC Activities Monitored by FR

- FR tracks any SQL you run, however you run it
 - Of course SELECT, INSERT, UPDATE, DELETE, etc.
 - Also stored procedures
 - Whether as CFSTOREDPROC or Call/Execute within CFQUERY (in CFML)
 - Or with executeQuery, execute, or executeUpdate (in Java)
 - And whether using prepared statements or not
 - CFQUERYPARAM (CFML)
 - PreparedStatement, CallableStatement (Java)
- And more than just “your own” SQL, but also generated SQL
 - ORM
 - Client variable processing (to database, in CFML)
 - Etc.
- Also MongoDB

JDBC Activity Displayed in FR UI

- *Requests* > (details on a given request)
 - "Main" tab: number of queries, total query time
 - "JDBC" tab: summary, row summary, details (sql, dsn, duration, rowcount, etc.)
 - Understanding "DB time" vs "Total time"
 - File and line number (where query occurred)
 - Query plan
- *JDBC* > *Activity/History/Slow/Longest/Graphs* pages
 - Identifying the request running the SQL shown (use "Relations" tab)
 - And newer "Error History", "Trans. By Mem" pages
 - Important "Databases" page
- Also:
 - *Metrics* > *CF Metrics* > *DB Pool Stats*
 - *Metrics* > *CF System Metrics* > *Cached Queries*

JDBC Activity Tracked in FR Alerts, Reports

- In FR CP alert emails (if enabled)
 - FR tracks any running SQL statements in any running requests
- In FR Daily Reports (if enabled)
 - Tracks "Avg JDBC" (query duration across all requests)
- , Weekly, Monthly Reports (which depend on FR edition, and if enabled)
 - Tracks "Avg JDBC" (query duration across all requests)
 - Monthly also tracks avg duration and count of JDBC activity, per day of week, over month

JDBC Activity Tracked in FR Logs

- JDBC logging: *jdbc.log*
 - Can track every request exceeding XX ms of total time (disabled by default)
- DB connection pooling logging: *dbpoolstats.log*
 - Tracks total, max, avg connections, per DSN, every 5 seconds

JDBC Activity Tracked in FR Cloud

- Among the various UI elements of FR Cloud are some specific to JDBC tracking:
 - *Transactions > Type > JDBC*
 - *Alerts ("Checks") > JDBC Activity | JDBC Time*

FR JDBC Activity Configurability

- *JDBC > Settings*
 - *"Logging / Metrics"* section
 - *"JDBC Logging"* (enabling, controlling when to track)
 - *"View Size"* (controls how much shown in *FR > Logs > JDBC Log* display)
 - *"Query Parameter Logging"* (controls showing prepared statement values)
 - *"SQL Text Limiting"* (controls number of chars of sql to display, log)
 - *"Stack Trace Settings"* section,
 - *"Query Location"* (enabling, controlling when to track)
 - Related *"JDBC > Stack Trace Filter"* (controls what part of stack trace to watch for JDBC)
 - *"Transaction Settings"* section
 - *"Obfuscate SQL Data"* (disables display of any "values" within SQL)
 - *"Transaction is Closed"* (controls when FR considers transaction closed)
 - *"History"* section
 - Controls aspects of JDBC activity shown in FR Request, JDBC pages
 - *"Query Plan Settings"* section (enabling, controlling when to track)

Other DSN-based FR JDBC Configurability

- There are several DSN-based configuration options to affect FR JDBC processing
- FR 7 and up track datasource name by default, but in previous releases:
 - `__fusionreactor_name=yourdbname;`
- FR5 and up tracks ALL JDBC activity, by default (no more need of wrapper)
 - But to disable JDBC tracking per DSN, if interested:
 - `__fusionreactor_exclude=yourdbname;`
- FR can log not only completed queries, but after so many rows, and after still more
 - `__fusionreactor_notifyAfter=1000`
 - `__fusionreactor_remindAfter=500`
 - A log message type field indicates if the log line is for a completed query or a notification/reminder
- ...

Other DSN-based FR JDBC Configurability (cont.)

- FR can even limit how many rows returned to your application, if ever needed
 - `__fusionreactor_rowLimit=10000;`
 - jdbc log tracks whether limiter was applied
- FR can be told to NOT reformat SQL for condensed display
 - Preserve spaces, linend, empty lines, etc.:
 - `__fusionreactor_inhibitReformat=true;`
- For more on these and other options:
 - <https://docs.fusion-reactor.com/display/FR71/JDBC+Monitoring+Options>
- One last topic, about going beyond FR JDBC monitoring
 - ...

Addressing DB Performance Problems Found

- Keep in mind DB Time vs Total Time
- Dealing with slow queries that really are slow
 - Warn about temptation to copy SQL and run it “directly” in a DB tool
 - If slow in both that tool and your app server, could be useful to observe
 - If “not slow” in tool but slow in your app server, could have other explanations:
 - Your SQL in tool may not be running as same user as your app server
 - Your SQL, copied from FR, is by default formatted to be condensed, not same as that sent from app server
 - Other SQL running at same time as slow request (but not now, when you are testing directly)
- ...

Addressing DB Performance Problems Found (cont.)

- Beware also “death of a thousand cuts/queries”
 - Single request running perhaps thousands of queries, though not any “slow”
- Keep in mind that “slow queries” could be due to issues affecting:
 - Entire app server (may not be just queries that are slow, such as memory or CPU problems)
 - Entire app server box (such as memory, CPU, disk problems affecting all apps)
 - Or perhaps entire DB or entire DB server box
 - Network between app server and DB box
- Really points to need to have as well some monitoring of DB server...

When Other DB Monitoring May be Necessary

- When FR says queries are slow, per “DB time”
 - You need help to know if the DB really is slow to process that query
 - And if so, why?
- Could be due to problems with your SQL, config of DB, table, indexes, statistics
- Could be due to other queries running on DBMS, not from your app/app server
- Could be due to DBMS configuration/misconfiguration issues
- Would be helpful to be able to see query processing, performance over time
 - Such as hours/days ago when FR showed that your app server was hung up due to queries
- Some DB monitoring tools
 - See my <http://www.cf411.com/dbmon> list of DB monitoring tools
 - Some free, some commercial
 - Some specific to a DBMS, some generic
 - Some only focus on real time, others also track historically

Bonus: Analyzing JDBC Log Data in Excel

- If we have time...
 - Reminder of opening FR JDBC log in Excel
 - Obtaining JDBC log headers
 - Creating a pivot table
 - Double-clicking aggregates to see how to show other column values
 - Refreshing sheet, pivot table with new data

Resources

- FR JDBC docs
 - <https://docs.fusion-reactor.com/display/FR71/JDBC>
 - <https://docs.fusion-reactor.com/display/FR71/JDBC+Monitoring+Options>
 - <https://docs.fusion-reactor.com/display/FR71/JDBC+Monitoring>
 - <https://docs.fusion-reactor.com/display/FR71/MongoDB+Monitoring>
- JDBC log details
 - jdbc.log : <https://docs.fusion-reactor.com/pages/viewpage.action?pageId=4548747>
 - dbpoolstats.log : <https://docs.fusion-reactor.com/pages/viewpage.action?pageId=4548857>
- FR Log file headers project
 - <https://github.com/JCSuthe/Fusion-Reactor-Coldfusion-Log-Tools>
- Past webinars on FR logs, FR configuration, Excel processing, etc.
 - <https://www.fusion-reactor.com/webinars>

Conclusion

- JDBC activity monitoring is a vital aspect of FR, as many issues are DB-related
- There's more to JDBC activity than just your SQL (also SP's, ORM, client vars, etc.)
- FR tracks JDBC activity in its UI, alerts, reports, and logs. Each has value
- Various aspects of JDBC mon are configurable: to track more info, more details
- Can stop FR tracking a DSN, can even limit rows returned for a DSN, more
- Sometimes points to need of other DB monitoring, for still more detail WITHIN DBMS
- But clearly FR JDBC monitoring itself adds incredible depth to troubleshooting, tuning

Other webinars

- www.fusion-reactor.com/webinars
 - Register for any newly added ones
 - Watch recordings of past ones

Other FR resources

- **FR web site: fusion-reactor.com**
 - Downloads
 - Docs, videos, technotes, forums, and much more
- **Email: sales@fusion-reactor.com, support@fusion-reactor.com**
- **Phone: (978) 496-9990 (sales)**
- **Consulting assistance: cfconsultant.com**
- We welcome your feedback on these or the other webinars, or any you would like to see

Questions & Answers