

Solving Problems in Ways Never Before Possible, with FusionReactor 7

INTERGRAL
information solutions

 fusion
reactor™

Introductions



Charlie Arehart

Independent Consultant, CArehart.org

(Focused on server troubleshooting)

Agenda

- Foreword
- Major new FR 7 features/solutions
 - Heap analysis, JMX metrics, AWS CloudWatch monitoring
 - What problems can be solved by these new features
- Major new FR 7.1 features/solutions
 - CPU Sampler, Threads Visualizer
- FR 7 extensions to existing features
- FusionReactor Cloud (production release)
- Reminders of other significant FR features
- Questions & answers

Who does this talk apply to?

- Anyone interested in troubleshooting/tuning servers; solving coding issues
 - Admins, managers, developers, devops
- Whether using any CFML engine
 - ColdFusion, Lucee, Railo, BlueDragon
- Or any Java application or server
 - Tomcat, JBoss, Wildfly, Jetty, WebSphere etc.
 - Or java applications: Solr, Confluence, Redis, etc.
- FusionReactor is implemented simply as a javaagent
- And is a low-cost, low-impact, reliable tool
 - Trusted for over 10 years by thousands of companies (over 30K servers world-wide)

Foreword

- Audience: presumed to already be using FR
 - But perhaps not using it—and especially newest features—to fullest extent
 - And those with problems, unaware there was a tool offering solutions
- Concepts apply generally to any Java/CFML server that FR can monitor
- Most discussion is about FusionReactor 7 (new this year)
 - Also introducing FR 7.1 (about to be released)
- Strong focus is on enabling in FR features that otherwise require additional tools
 - And those other tools typically require modification of JVM arguments
 - And such mods and tools are typically not used in production
 - **FR requires no such external tools or jvm args, and IS designed for production!**
 - All new features are available via the FusionReactor web interface

Major New FR 7 Features/Solutions

Want to resolve JVM memory leaks?

- FR 7 adds a memory profiler, allowing you to explore the heap
 - Use New **Memory** button on left (in Ultimate, Trial, Developer editions)
 - Explore GC roots
 - Take and compare snapshots over time
- All in the FR UI
 - No need to modify JVM arguments (such as to expose RMI)
 - No need to implement, learn different JVM tools or IDE extensions
 - Intended of course for use in production
 - Very low overhead, like all of FusionReactor
- Clearly can help spot JVM memory leaks...or cases of unexpected heap use

Wish you could understand JMX metrics better?

- FR 7 adds built-in support to view, explore, and graph JMX metrics
 - See new ***Metrics>JMX Mbeans*** feature (3 related pages)
 - Can browse them, choose ones to graph, and more
- Can of course be used to measure ANY aspect of your application/application server which may expose metrics via JMX
 - Can view all, can change those that are modifiable settings
- Again all in the FR web UI, with no JVM changes required
- Consider for instance tracking the Tomcat web server connector used by CF, Lucee
 - See *Catalina>GlobalRequestProcessor* metric for desired AJP thread
 - Also *Catalina>ThreadPool*
- Notice option to choose among selected metrics in top right of *Graphs* page

Want to watch your server's performance via AWS CloudWatch?

- FR 7 lets you export over 150 metrics to AWS CloudWatch
 - See new ***Metrics>AWS CloudWatch Metrics*** feature
- Can track about any selected FR metric, and also any selected JMX metric
- Once there, you can do further analysis, alerting via CloudWatch

Major New FR 7.1 Features/Solutions

CPU Sampler and Threads Visualizer

- Many know that FR 6 Ultimate added powerful request profiling
 - To understand which underlying java methods within a request spent the most time
- FR 7.1 adds thread profiling (across any and all threads)
 - New **Profiler>CPU Sampler** and related **CPU Snapshots** feature
 - And separate but related **Resources>Threads Visualizer** feature
- Can be useful to spot CPU use (and waits and blocks) in other than request threads
 - Sampler present same info and features in different views
- Both offer option to profile a given thread
 - Result appears in **Profiler>Profile History**
- Why are these options to view details of non-request threads valuable?
- More to come in FR 7.1, but let's move on to changes of existing features in FR7

FR 7 Extensions to Existing Features

Improved capabilities

- New option to **pause** requests and threads
- Requests are **now profiled for first 60 seconds**, rather than entire request.
Configurable
 - Can also now **profile a request anytime during its life**
- Enhanced error tracking for requests and queries
 - See new *Requests>* and *JDBC>Error History*
- Support for **monitoring Kafka**
- ...

Sometimes it's the little things...

- Enhanced tracking of calls to external resources
 - See new *Transactions>External Resources*
- FR now **auto-detects datasource names** for display with queries
 - No longer need to use DSN connectionstring arg to identify each datasource name
- **Production Debugger UI improvements:**
 - **More easily view current variables** at a breakpoint
 - View variable values **at different states per selected stack frame**
 - Now able to **"watch" specific variables/expressions** while stepping
- And more
- But let's move on to FR Cloud

FusionReactor Cloud (production release)

Major new way to use, look at FusionReactor

- Extends the current on-premise/in-JVM FR deployment (java agent)
 - To now additionally send nearly all FR metrics (and profiles and more) to the cloud
- Not about YOU running in the cloud. FR is running in the cloud!
 - You then use a new FR Cloud UI for viewing information about servers, metrics
 - FR manages the cloud deployment details (database import, volume mgt)
- The new FR Cloud UI offers features not previously available in FR
 - Since it runs in cloud, with db backing, new features don't add cost to JVM
- Consider for instance ...

Major new way to use, look at FusionReactor

- Can now view information across **up to 90 days** (not just since last restart)
 - Powerful **time selector** (let's look)
- Also **much more powerful notifications features**
 - Can **alert on any of several metrics**
 - Can **notify any of many platforms**: PagerDuty, Slack, HipChat, email, and more
- Powerful **Applications view** (let's look)
- Expect more and more features to be added to cloud over time
 - Don't miss **change log icon** in top right corner
- FR Cloud is a separately purchased feature

Reminders of Other Significant FR features

Some other recent additions in FR 6

- The **request profiling** and **production debugger** mentioned previously
- Ability to view metrics by application (**application drop down** on many pages)
- Also new **Requests>Applications** page in FR 6, tracking activity per Application
 - And then per URL within the app, since startup!
- Enhanced **Relations** tab (in request details)
- **Monitoring of NOSQL databases**
- **System Resources** page
 - With details about total system resources (CPU, memory, disk) on box
- **Obfuscation** features (to protect privacy data in logs, cloud, alerts)
- **CFML line execution metrics** (for CF and Lucee)
- And more

All this is on top of what FR has long offered

- **High-level metrics** page reporting current state of instance processing
 - Requests, JDBC, Memory, CPU
- **Request activity, history**, including recent, longest, and recently slow
 - Details on each request, including queries run within each request, and more
- Also **JDBC activity, history** (recent/longest/recently slow) across all requests
- Various **CF-specific metrics** exposed (counts of sessions, query cache, more)
- **Crash protection** (emails to notify you when alert conditions arise)
 - Including details that make solving problems so much easier!
- **Logs** that track all this, for up to 30 days by default
- **Enterprise Dashboard**, to watch multiple servers from single screen
- Support for your deployment of monitored instances in cloud, docker, and more

Conclusion

- Phew, FR does a lot!
- And still more in latest versions
- FR 7 especially introduces more powerful deep analysis
 - Heap profiling
 - Request profiling
 - And in 7.1 thread CPU sampling and visualization
- FR7 also extends many long-existing features
- FR Cloud changes the game for FR monitoring capabilities
- All this on top of what FR has always done
- Simply no better solution for FR monitoring, troubleshooting, debugging
 - And again all meant for live production use, in even the most advanced deployments

Other FR resources

- **FR web site: fusion-reactor.com**
 - Downloads
 - Docs, webinars, 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