

A group of people in a dimly lit office are looking at a computer monitor. The monitor displays a dashboard with various charts and data. The scene is illuminated by desk lamps, creating a focused and professional atmosphere.

Solving problems in ways never before possible
with FusionReactor 7 and FR CLOUD

INTERGRAL
information solutions

 fusion
reactor™

Introductions



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Agenda

- What is FusionReactor & what can it do for you ?
- What's New in FusionReactor 7
- Solving Problems in new ways with fully integrated "Error and Analysis" tools
 - Code Debugger, Code/Memory/CPU Profiler, Thread Vizualizer
- FusionReactor CLOUD (production release)
- Questions & answers

Who does this talk apply to?

- Anyone interested in troubleshooting/tuning servers; solving coding or quality issues
 - Admins, managers, developers, DEVOPS
- FusionReactor supports ColdFusion and much more:
 - All CFML engines - ColdFusion, Lucee, Railo, BlueDragon
 - All Java servers - Tomcat, JBoss, Wildfly, Jetty, WebSphere, GlassFish etc.
 - Any Java applications – Apache Solr, Redis, Kafka, Confluence, etc.
 - Most DB's (SQL/No-SQL) - Oracle, SQL Server, MYSQL, Hibernate, Cassandra, MongoDB etc.
- FusionReactor is implemented simply as a java agent
- And is a low-cost, low-impact, reliable tool
 - Trusted for over 12 years by thousands of companies (with over 5K customers and over 25K servers running FusionReactor in production)

What is FusionReactor & what can it do for you?

- Watch what is going on, what has gone on, where the issues are
 - **High-level metrics** page reporting current state of instance processing
 - Requests, JDBC/NoSQL activity , Memory, CPU
 - **Request activity, history**, including recent, longest, and recently slow
 - Details on each request, including queries run within each request, relations, and more
 - **JDBC activity, history** (recent/longest/recently slow) across all requests
 - Many **CF-specific metrics** exposed (counts of sessions, query cache, more)
 - **Memory usage** within JVM (heap and more), and **garbage collection**
 - **All this is logged**, kept for 30 days by default (~400 mb per month)
 - Logs are great for post-crash analysis
 - See available webinar on this, and still more on using logs, processing with Excel, etc
 - And still more ...

What is FusionReactor & what can it do for you? (cont.)

- **System Monitor** – see details of underlying system – not just the server instance
- **User Experience Monitoring** – see end to end performance
- **Code Profiler** and **Production Debugger** – more on these later
- **Crash Protection** – increase resilience and receive alerts when conditions arise
- **Obfuscation** – to protect privacy data in logs, alerts, cloud
- **Enterprise Dashboard** – watch multiple servers from single screen
- **CFML line execution metrics** (for CF and Lucee)
- Again, these are just the things FR has had for a while!

What's new in FusionReactor 7

20 completely new core features

100 major improvements and bug fixes

Still more metrics – first, full support for JMX

- JMX = Java Management Extensions – manage & monitor apps, system objects, devices
- 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

Even more metrics: new framework support

- FR can now auto-detect , distinguish requests for popular CF Frameworks
 - **ColdBox** (and ProfileBox is an available implementation of FR within ColdBox!)
 - **Framework One (FW/1)**
 - **Fusebox**
 - Using your own Framework? No problem – just define the syntax in FR
- Has long supported also **Spring, Struts, Play** java frameworks
 - Now supports Eclipse vert.x 3, polyglot event-driven application framework
- NoSQL – NO PROBLEM
 - Additional metrics - queryplan/explain information for **MongoDB**
 - Instrumentation metrics for MongoDB 3.0 Async driver
 - Support for Apache **Cassandra**
 - Support for **Redis** is an open source, in-memory data structure store
- Added consumer metrics for **Kafka** distributed streaming pub/sub platform

See 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

Sometimes it's the little things: other recent changes

- FR now **auto-detects datasource names** for display with queries
 - No longer need to use DSN connectionstring arg to identify each datasource name
- Enhanced tracking of calls to external resources
 - See new *Transactions>External Resources*
- Enhanced error tracking for requests and queries
 - See new *Requests>* and *JDBC>Error History*
- New option to **pause** requests and threads
- Can now **profile a request anytime during its life** (not just from start)
- Can now **"watch" specific variables/expressions** while stepping
- But many of you have never seen the profiling and debugging features
 - Let's bring on David to discuss these and other powerful/new features!

Solving Problems in new ways:

Fully integrated, low overhead

“Error and Analysis” tools

FusionReactor 7 - Solving Problems in new ways....

- FR is NOT only about capturing metrics and logging/alerting !
- FusionReactor is all about **SHORTENING** time needed to **IDENTIFY DEFECTS** and **PERFORMANCE ISSUES** with our integrated, low overhead, production safe - '**Error & Analysis Tools**' –
 - FusionReactor Ultimate – contains - **Code Debugger, Code Performance Profiler, Memory Analyzer and Thread Profiler**
 - Compare with developer tools like Eclipse, FusionDebug, JProfiler, JVisualVM – but FusionReactor is **LOW OVERHEAD** and can be used **SAFELY** in **PRODUCTION** !

Want to isolate JVM memory leaks?

- FR 7 adds a memory profiler, allowing you to explore the heap in “REAL TIME”
 - 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 (LESS THAN 1 %), like all of FusionReactor
- Clearly can help spot JVM memory leaks...or cases of unexpected heap use

Understand and see what a threads are “really” doing

- FR 7 adds thread profiling (across any and all threads) + thread Visualizer
 - 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
 - See how much “real CPU time” has been spent processing a thread
- Both offer option to profile a given thread
 - Result appears in **Profiler>Profile History**
- Thread Visualizer will also let you stacktrace a given thread – then DECOMPILE
- Why are these options to view details of non-request threads valuable?

Want to identify code performance bottlenecks?

- Code profiler identifies how much time is being spent in specific methods
 - Shows real time in ms and percentage of time spent
 - ***Profiler>Active Profiling and Profiler>Profile History***
- Profiler is really a “catch all” for performance issues
- On by default for all requests/transactions which run longer than 3 seconds
- Profiles are created by aggregating stack-trace snapshots (~ 1 millisecond)
- Why are these options to view details of non-request threads valuable?

Production Debugger – easily detect production errors

- Integrated “IDE Style” debug capability
- Set a breakpoint (TRIGGER) –
 - On exception | On Method Entry | Source File / Line # | On variable value / set
- Control this breakpoint
 - By time – fire and hold the breakpoint for X seconds
 - By IP address – only fire if I call you
 - By call frequency – e.g. only trigger a breakpoint one time – SINGLE THREAD
- Initiate various actions when a TRIGGER occurs
 - Open a fully integrated step debugger (no bother of setting up an IDE)
 - Send an Email – Includes Stack Trace + Variable Scope (forget CFDUMP)

Announcing FusionReactor CLOUD

FusionReactor CLOUD – additional features/benefits

- Extends the current on-premise JVM FR deployment - **SAME java agent !**
- Not about YOU running in the cloud. FR is running in the cloud!
- FR **pushing metrics**, profiles and “Interesting Transactions” to the cloud (**each minute**)
- **Data packs** sent to the cloud **are tiny !** Data is fully compressed
- Licensing – Server/Host **Reservations** + **On-Demand** (great for container usage)
- FR CLOUD is available as Enterprise (30 days) and Ultimate (90 days)
- A cloud license **INCLUDES** the on-premise license
- FR Cloud is **available** as **Enterprise** (\$99 month) or **Ultimate Edition** (\$149 month)

Key Features

- View **historical** information **up to 90 days on ULT – 30 days ENT**
- **Save transactions, profiles, JDBC data** to review with peers
- **See what's going on from an Application Perspective**
 - Combine data coming from multiple instances into a single Application view
- Fully featured **Alerting Engine**
 - Alert based on group/instance/application metrics
 - Define – how you're alerted – seamless integration with PagerDuty, Slack, Hipchat, email etc.
- On-Demand licensing makes it easy to support dynamic (containerized) environments
 - **See Brad Wood's video – (google) Deploying FusionReactor with Docker Swarm –**
- Expect more and more features to be added to cloud over time
- FR Cloud is available as Enterprise (\$99 month) or Ultimate Edition (\$149 month)

Conclusion

- Phew, FR does a lot!
- And still more in latest versions
- FR 7 especially introduces more powerful deep analysis
 - Heap profiling
 - Request profiling
 - 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, YouTube Channel and much more
- **Email: sales@fusion-reactor.com, support@fusion-reactor.com**
- **Phone: (978) 496-9990 (sales)**
- **Consulting assistance: cfconsultant.com**



Questions & Answers