

Liferay Boot Camp 2021 Digital Edition

A way to monitoring, profiling and troubleshooting your DXP installation



Giovanni Zuliani
System Architect



Summary



Java Development Tools



Overview JMC



JMX Console



Java Flight Recorder



JCMD Command



Demo



Java Development Tools

APM (Monitoring – Profiling – Troubleshooting)

Jprofiler (Profiling)

VisualVM (Monitoring)

Java Mission Control (Monitoring – Profiling – Troubleshooting)

OVERVIEW JMC





Overview JMC

Monitoring, profiling, and troubleshooting

Connect to Local and Remote JVM

Data analysis

JMX Console

Java Flight Recording



Overview JMC

Local JVM automatically detected

Remote JVM needs JMX parameters to allow connection

- Dcom.sun.management.jmxremote
- Dcom.sun.management.jmxremote.port=<PORT>
- Dcom.sun.management.jmxremote.authenticate=false
- Dcom.sun.management.jmxremote.ssl=false



Overview JMC

Lowest possible impact on the running system

Suitable for use in production environments

Provide accurate data for your application

Oracle JDK releases from 7 to 10 contain JMC

Now available as a separate download

JMC has been recently open sourced

JMX Console





JMX Console – Overview

Overview Tab

Mbeans Browser Tab

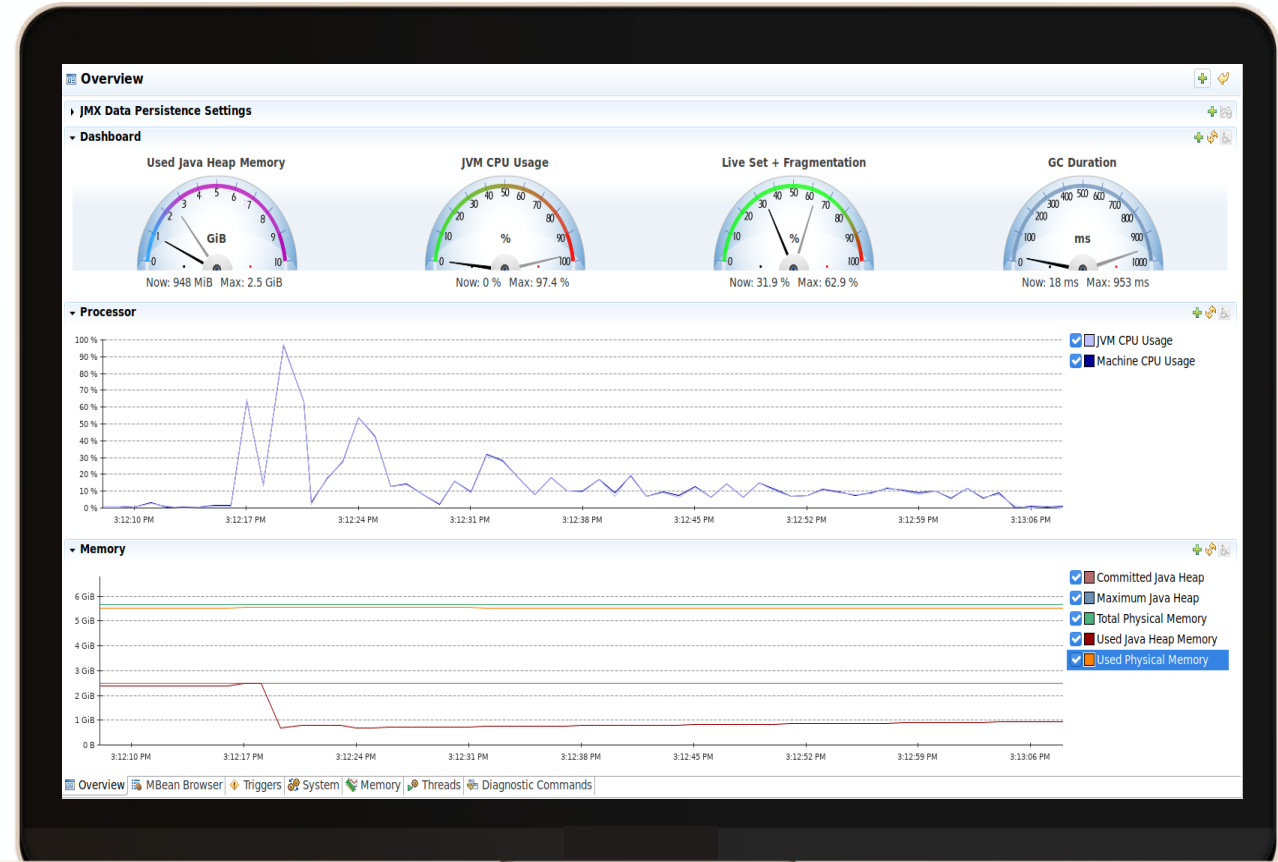
Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab





JMX Console – Mbean Browser

Overview Tab

Mbeans Browser Tab

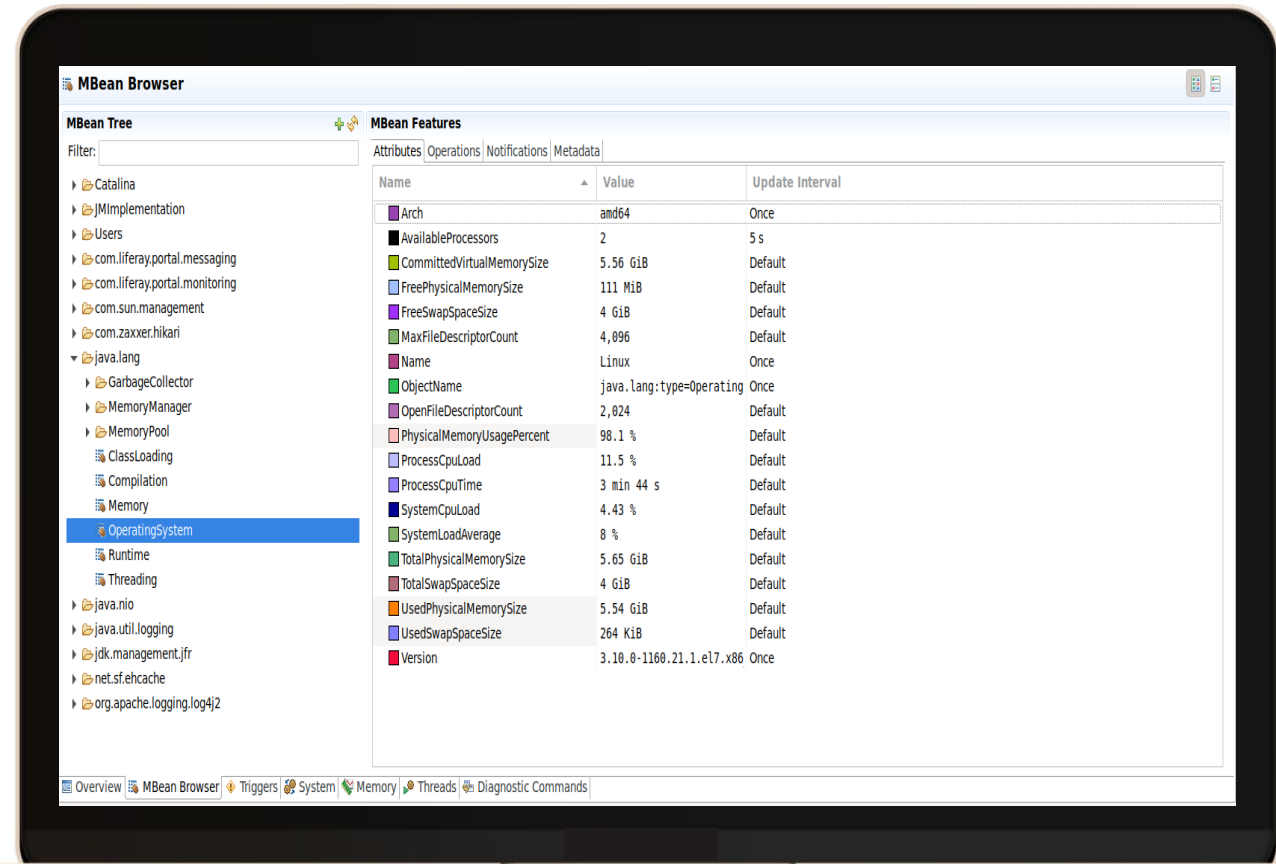
Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab



JMX Console – Triggers

Overview Tab

Mbeans Browser Tab

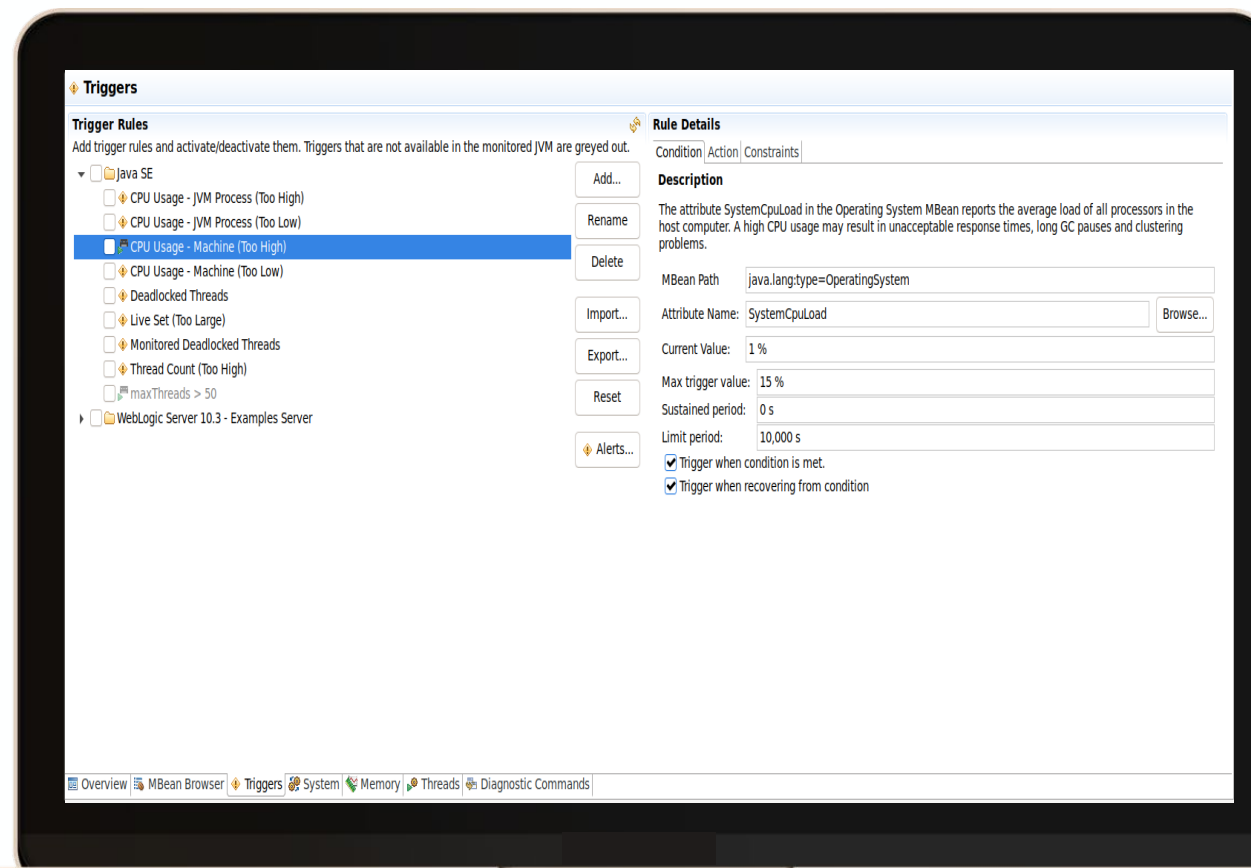
Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab





JMX Console – System

Overview Tab

Mbeans Browser Tab

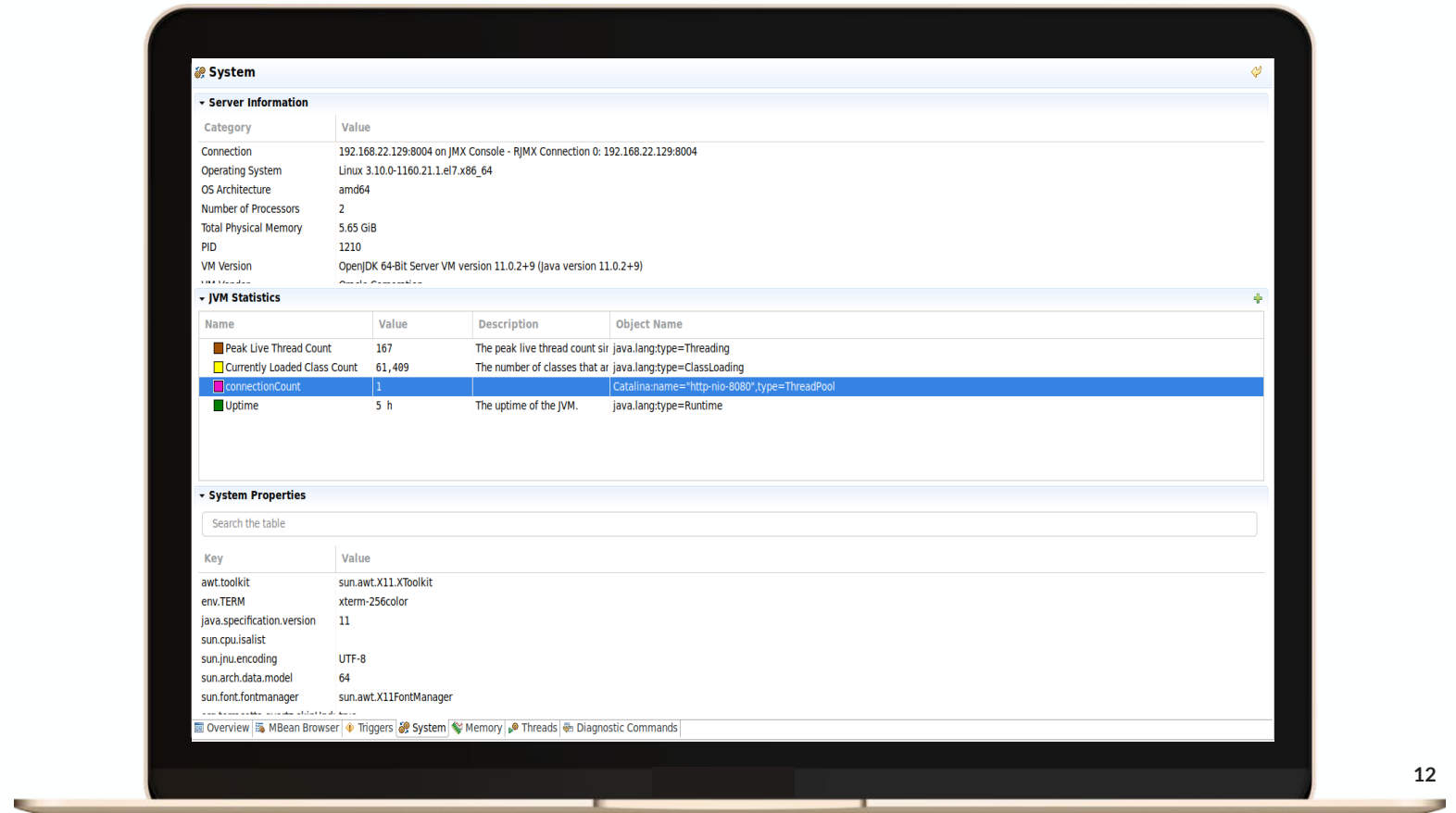
Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab





JMX Console – Memory

Overview Tab

Mbeans Browser Tab

Triggers Tab

System Tab

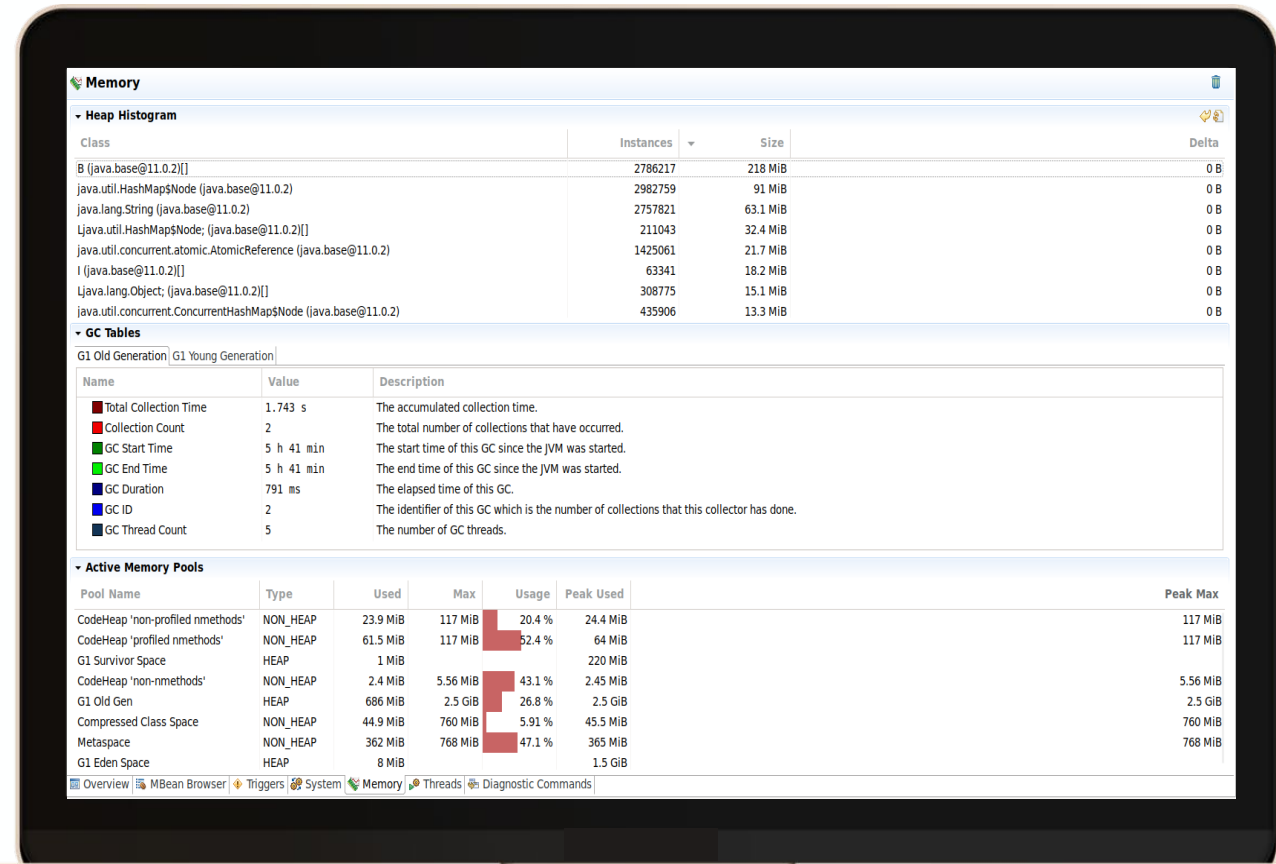
Memory Tab

Thread Tab

Diagnostic Command Tab

#LRBC2021

@gzu1066





JMX Console – Threads

Overview Tab

Mbeans Browser Tab

Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab

The screenshot displays the JMX Console's 'Threads' tab. At the top, there's a 'Live Thread Graph' section. Below it, the 'Live Threads' section shows a search bar and checkboxes for 'CPU Profiling', 'Deadlock Detection', and 'Allocation'. The main part of the screen is a table with columns: Thread Name, Thread State, Blocked Count, Total CPU Usage, Deadlocked, and Allocated Memory. The table lists several threads, including 'liferay/scheduler_dispatch-3' through 'liferay/scheduler_dispatch-6' (all in TIMED_WAITING state), 'com.liferay.portal.workflow.metrics.interna' (WAITING), 'Catalina-utility-1' (WAITING), 'Catalina-utility-2' (TIMED_WAITING), and a group of 'http-nio-8080-exec' threads (all in WAITING state). The 'http-nio-8080-exec-1' thread is highlighted. Below the table, the 'Stack Traces for Selected Threads' section shows the stack trace for 'http-nio-8080-exec-1 [169] (WAITING)', listing various Java and Tomcat classes and methods. At the bottom, there's a navigation bar with tabs for Overview, MBean Browser, Triggers, System, Memory, Threads (selected), and Diagnostic Commands.

Thread Name	Thread State	Blocked Count	Total CPU Usage	Deadlocked	Allocated Memory
liferay/scheduler_dispatch-3	TIMED_WAITING	93	Not Enabled	Not Enabled	Not Enabled
liferay/scheduler_dispatch-4	TIMED_WAITING	138	Not Enabled	Not Enabled	Not Enabled
liferay/scheduler_dispatch-5	TIMED_WAITING	139	Not Enabled	Not Enabled	Not Enabled
liferay/scheduler_dispatch-6	TIMED_WAITING	137	Not Enabled	Not Enabled	Not Enabled
com.liferay.portal.workflow.metrics.interna	WAITING	14	Not Enabled	Not Enabled	Not Enabled
Catalina-utility-1	WAITING	1	Not Enabled	Not Enabled	Not Enabled
Catalina-utility-2	TIMED_WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-1	WAITING	5	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-2	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-3	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-4	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-5	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-6	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-7	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-8	WAITING	0	Not Enabled	Not Enabled	Not Enabled
http-nio-8080-exec-9	WAITING	0	Not Enabled	Not Enabled	Not Enabled

Stack Traces for Selected Threads
Stack traces for selected threads 2:58:17 PM
http-nio-8080-exec-1 [169] (WAITING)
jdk.internal.misc.Unsafe.park line: not available [native method]
java.util.concurrent.locks.LockSupport.park line: 194
java.util.concurrent.locks.AbstractQueuedSynchronizer\$ConditionObject.await line: 2081
java.util.concurrent.LinkedBlockingQueue.take line: 433
org.apache.tomcat.util.threads.TaskQueue.take line: 107
org.apache.tomcat.util.threads.TaskQueue.take line: 33
java.util.concurrent.ThreadPoolExecutor.getTask line: 1054
java.util.concurrent.ThreadPoolExecutor.runWorker line: 1114



JMX Console – Diagnostic Commands

Overview Tab

Mbeans Browser Tab

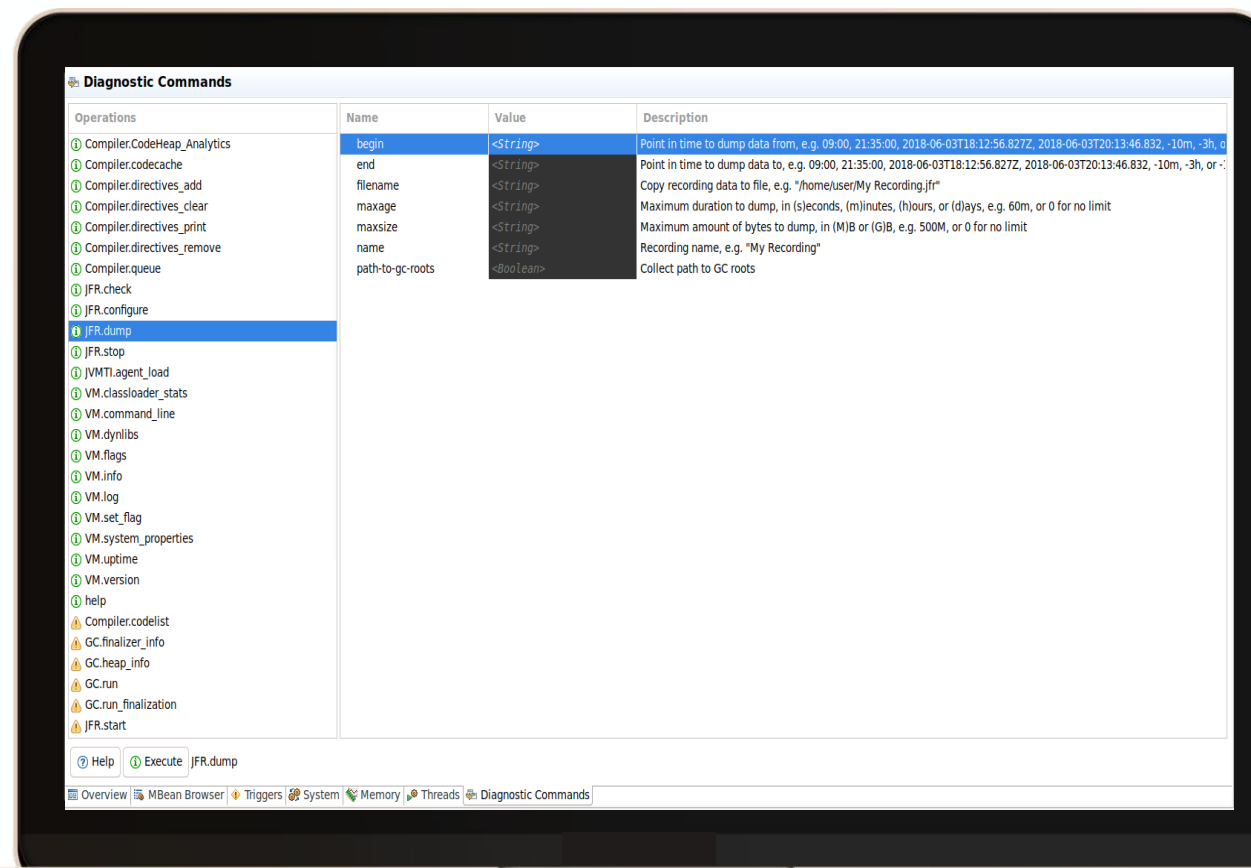
Triggers Tab

System Tab

Memory Tab

Thread Tab

Diagnostic Command Tab



Java Flight Recorder





Java Flight Recorder

Java Flight Recorder is a profiling and event collection framework built into JDK.

Provides a way to collect events from a Java application from the OS layer, the JVM, and all the way up to the Java application.

The collected events include thread latency events such as sleep, wait, lock contention, I/O, GC, and method profiling.

JFR has low performance impact, less than 2% for typical Java applications

`-XX:+UnlockCommercialFeatures -XX:+FlightRecorder`

JCMD Command



JCMD Command

JCMD send diagnostic command requests to a running Java Virtual Machine (JVM)

It must be used on the same machine on which the JVM is running

Each diagnostic command has its own set of arguments.

JCMD Command

jcmm -l : List of Java running on server

To start a JFR recording of 1 minute with output to file:

```
-jcmm <PID> JFR.start duration=1m name=Record-jcmm  
filename=$HOME/JFR-Record-Jcmm.jfr
```

<PID>

Started recording 3. The result will be written to:

/home/gzuliani/JFR-Record-Jcmm.jfr

Demo JFR



Demo Trigger



Demo JCMD



Q&A



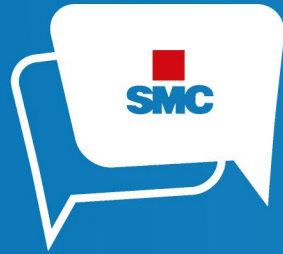
Contacts

GIOVANNI ZULIANI

giovanni.zuliani@smc.it

GitHub @giovanni-zuliani

Twitter @gzu1066



Liferay Boot Camp 2021 Digital Edition

Thank you 😊