

故障排除工具集

Troubleshooting Tools on Solaris OS and Linux for Java SE 7

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Monitoring Tools 监视工具

Java VisualVM 可视化虚拟机（多线程的监控分析工具）

监视和分析工具

Java™ VisualVM is a monitoring and profiling tool for troubleshooting Java applications. It incorporates various technologies, including jvstat and JMX, as well as CPU and memory profiling, to provide one easy-to-use integrated visualization tool. Developers can rapidly create their own extensions using a public API, and may share them with the community on a central repository.

- Display local and remote Java applications.
- Display application configuration and runtime environment.
- Monitor application memory consumption and runtime behavior. 监视应用内存消耗和运行时行为
- Monitor application threads. 监视应用线程
- Profile application performance or analyze memory allocation. (Local applications only.)
- Create and display thread dumps. 线程转储
- Create and browse heap dumps. 堆转储
- Analyze core dumps.
- Analyze applications offline. 离线分析应用
- Get additional plugins contributed by the community.
- Write and share your own plugins.

JConsole

监视和管理Java应用和虚拟机

Launch a GUI to monitor and manage Java applications and Java VMs on a local or remote machine.

- Connection to Java process, host, or JMX agent.
- Graphical overview of CPU usage, heap memory, threads, classes. CPU使用、堆内存、线程和类的图形概述
- Summary of key data, for example, uptime, compilation time, objects pending finalization, and more.
- Memory statistics, including garbage collection. 内存统计（包括垃圾收集）
- Request garbage collection.
- Thread statistics. 线程统计
- Deadlock detection. 死锁检测
- Class statistics.
- Tree structure of all platform and application MBeans. 所有平台和应用MBeans的树结构
- Set the value of an MBean attribute. 设置MBean属性的值
- Invoke operation on an MBean, for example, perform a heap dump.
- Subscribe to notification for an MBean.
- Information about the virtual machine, the compiler, the operating system.
- Pass flags to VM on which JConsole is running.

jps

jps -l、jps -lv

List instrumented Java virtual machines. 罗列虚拟机进程

[jstat](#)

展示一个虚拟机的性能统计数据

Display **performance statistics** for an instrumented **Java VM**:

- Behavior of the **class loader**
- Behavior of the **HotSpot Just-in-Time compiler**, **totals and by method**
- Behavior of the **GC heap** GC 堆: `jstat -gcutil vmID 1s`
- Behavior and **sizes** of the **generation areas** 各个代区的大小

[jstatd](#)

- Monitor for creation and termination of instrumented HotSpot Java VMs.
- Provide an interface for remote monitoring tools to attach to Java VMs.

Debugging Tools 调试工具

HPROF profiler

HPROF: Heap and CPU Profiling Agent (JVMTI Demonstration Code)

Writes class profiling information to a file or a socket, in ASCII or binary.

- **Heap allocation** profiling.
- Heap dump.
- **CPU usage** - for threads, methods.
- Monitor contention profiling.

To invoke the HPROF tool: `java -agentlib:hprof ToBeProfiledClass`

To print the complete list of options: `java -agentlib:hprof=help`

[jdb](#)

Launch a simple interactive command-line debugger.

- Display Java objects and primitive values.
- List currently running threads.
- Dump the current thread stack.
- Set breakpoints.
- Step through execution.
- Examine exceptions.

[jhat](#)

Parse a binary heap dump, launch a web browser, and present standard queries.

- Execute standard queries, for example, classes, objects, class instances, reference chains from object rootset, reachable objects, and more.
- Turn on or off object allocation tracking.
- Turn on or off object reference tracking.
- Specify objects to exclude from "reachable objects" query.
- Pass flags to the Java VM on which `jhat` is running.
- Develop custom queries with built-in Object Query Language.
- Compare objects in two dumps.

[jinfo](#)

- Print command line flags and system properties for a running process, from a core file, or for a remote debug server.
- Dynamically set, unset, or change the value of certain Java VM flags for a process.

jmap

- Print shared object mappings for a process, a core file, or a remote debug server.
- Dump the Java heap (all objects or only live objects) of a process, a core file, or a remote debug server in binary format to a file.
- Force the Java heap dump of a process if the process does not respond.
- Print a heap summary for a process, a core file, or a remote debug server.
- Print a histogram (all objects or only live objects) of a process, a core file, or a remote debug server.
- Print information on objects awaiting finalization.
- Print class loader statistics of the permanent generation.
- Pass flags to the VM.

jsadebugd

Serviceability Agent Debug Daemon, which acts as debug server.

- Attach to a Java process or a core file.
- Remote clients can attach to the server using RMI.

jstack

- Print stack traces of threads for a process, core file, or remote debug server
- Print information about concurrent locks for a process, core file, or remote debug server
- Force the stack dump for a process if the process does not respond

Scripting Tools

jrunscript

- Command-line script shell: Evaluate or execute a script in interactive or batch mode.
 - Pass flag to the VM.
 - Set Java system properties.
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