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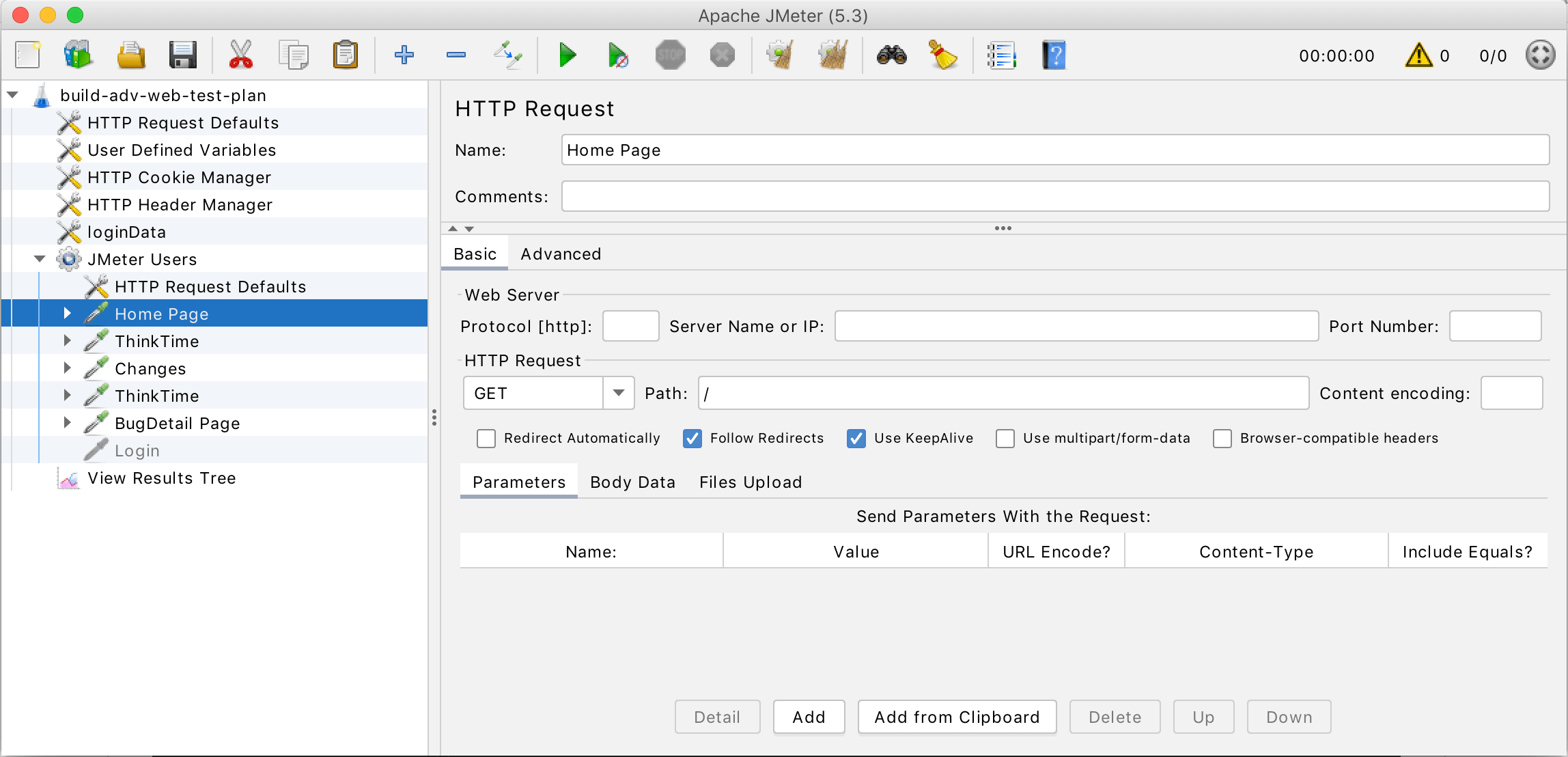
An Open Source Java application designed to measure performance and load test applications.

By The Apache Software Foundation

**What Is It?**

Apache JMeter can measure performance and load test static and dynamic web applications.

It can be used to simulate a heavy load on a server, group of servers, network or object to test its strength or to analyze overall performance under different load types.

[](https://raw.githubusercontent.com/apache/jmeter/master/xdocs/images/screenshots/jmeter_screen.png)

**Features**

Complete portability and 100% Java.

Multi-threading allows concurrent sampling by many threads and simultaneous sampling of different functions by separate thread groups.

**Protocols**

Ability to load and performance test many applications/server/protocol types:

* Web - HTTP, HTTPS (Java, NodeJS, PHP, ASP.NET,...)
* SOAP / REST Webservices
* FTP
* Database via JDBC
* LDAP
* Message-oriented Middleware (MOM) via JMS
* Mail - SMTP(S), POP3(S) and IMAP(S)
* Native commands or shell scripts
* TCP
* Java Objects

**IDE**

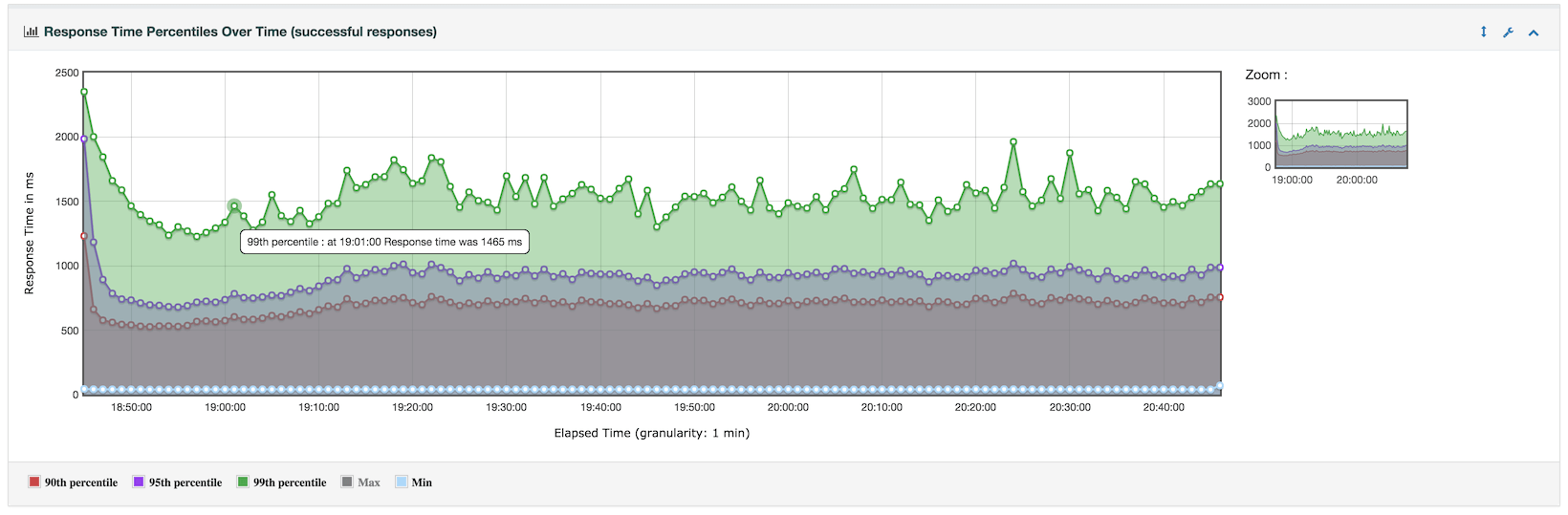
Fully featured Test IDE that allows fast Test Plan **recording** (from Browsers or native applications), **building** and **debugging**.

**Command Line**

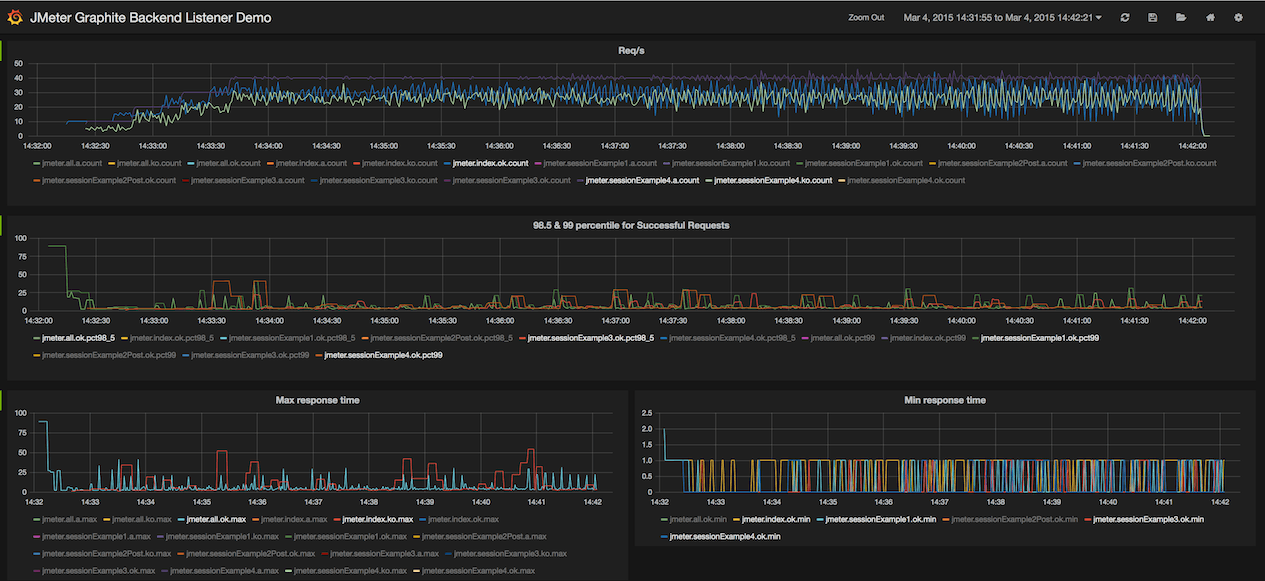
[Command-line mode (Non GUI / headless mode)](https://jmeter.apache.org/usermanual/get-started.html#non_gui) to load test from any Java compatible OS (Linux, Windows, Mac OSX, ...)

**Reporting**

A complete and ready to present [dynamic HTML report](https://jmeter.apache.org/usermanual/generating-dashboard.html)

[](https://raw.githubusercontent.com/apache/jmeter/master/xdocs/images/screenshots/dashboard/response_time_percentiles_over_time.png)

[Live reporting](https://jmeter.apache.org/usermanual/realtime-results.html) into 3rd party databases like InfluxDB or Graphite

[](https://raw.githubusercontent.com/apache/jmeter/master/xdocs/images/screenshots/grafana_dashboard.png)

**Correlation**

Easy correlation through ability to extract data from most popular response formats, [HTML](https://jmeter.apache.org/usermanual/component_reference.html#CSS/JQuery_Extractor), [JSON](https://jmeter.apache.org/usermanual/component_reference.html#JSON_Extractor), [XML](https://jmeter.apache.org/usermanual/component_reference.html#XPath_Extractor) or [any textual format](https://jmeter.apache.org/usermanual/component_reference.html#Regular_Expression_Extractor)

**Highly Extensible Core**

* Pluggable Samplers allow unlimited testing capabilities.
* **Scriptable Samplers** (JSR223-compatible languages like Groovy).
* Several load statistics can be chosen with **pluggable tiers**.
* Data analysis and **visualization plugins** allow great extensibility and personalization.
* Functions can be used to provide dynamic input to a test or provide data manipulation.
* Easy Continuous Integration via 3rd party Open Source libraries for Maven, Gradle and Jenkins.

**The Latest Version**

Details of the latest version can be found on the [JMeter Apache Project web site](https://jmeter.apache.org/)

**Requirements**

The following requirements exist for running Apache JMeter:

* Java Interpreter:

A fully compliant Java 17 Runtime Environment is required for Apache JMeter to execute. A JDK with keytool utility is better suited for Recording HTTPS websites.

* Optional jars:

Some jars are not included with JMeter. If required, these should be downloaded and placed in the lib directory

* + JDBC - available from the database supplier
  + JMS - available from the JMS provider
  + [Bouncy Castle](https://www.bouncycastle.org/) - only needed for SMIME Assertion
* Java Compiler (*OPTIONAL*):

A Java compiler is not needed since the distribution includes a precompiled Java binary archive.

**Note** that a compiler is required to build plugins for Apache JMeter.

**Installation Instructions**

**Note** that spaces in directory names can cause problems.

* Release builds

Unpack the binary archive into a suitable directory structure.

**Running JMeter**

1. Change to the bin directory
2. Run the jmeter (Un\*x) or jmeter.bat (Windows) file.

**Windows**

For Windows, there are also some other scripts which you can drag-and-drop a JMX file onto:

* jmeter-n.cmd - runs the file as a non-GUI test
* jmeter-n-r.cmd - runs the file as a non-GUI remote (client-server) test
* jmeter-t.cmd - loads the file ready to run it as a GUI test

**Documentation**

The documentation available as of the date of this release is also included, in HTML format, in the [printable\_docs](https://github.com/apache/jmeter/blob/master/printable_docs) directory, and it may be browsed starting from the file called [index.html](https://github.com/apache/jmeter/blob/master/printable_docs/index.html).

**Reporting a bug/enhancement**

See [Issue Tracking](https://jmeter.apache.org/issues.html).

**Build instructions**

**Release builds**

Unpack the source archive into a suitable directory structure. Most of the 3rd party library files can be extracted from the binary archive by unpacking it into the same directory structure.

Any optional jars (see above) should be placed in lib/opt and/or lib.

Jars in lib/opt will be used for building JMeter and running the unit tests, but won't be used at run-time.

*This is useful for testing what happens if the optional jars are not downloaded by other JMeter users.*

If you are behind a proxy, you can set a few build properties in ~/.gradle/gradle.properties for Gradle to use the proxy:

systemProp.http.proxyHost=proxy.example.invalid

systemProp.http.proxyPort=8080

systemProp.http.proxyUser=your\_user\_name

systemProp.http.proxyPassword=your\_password

systemProp.https.proxyHost=proxy.example.invalid

systemProp.https.proxyPort=8080

systemProp.https.proxyUser=your\_user\_name

systemProp.https.proxyPassword=your\_password

**Test builds**

JMeter is built using Gradle, and it uses [Gradle's Toolchains for JVM projects](https://docs.gradle.org/current/userguide/toolchains.html) for provisioning JDKs. It means the code would search for the needed JDKs locally, or download them if they are not found.

By default, the code would use JDK 17 for build purposes, however it would set the target release to 8, so the resulting artifacts would be compatible with Java 8.

The following command builds and tests JMeter:

./gradlew build

If you want to use a custom JDK for building you can set -PjdkBuildVersion=11, and you can select -PjdkTestVersion=21 if you want to use a different JDK for testing.

You can list the available build parameters by executing

./gradlew parameters

If the system does not have a GUI display then:

./gradlew build -Djava.awt.headless=true

The output artifacts (jars, reports) are placed in the build folder. For instance, binary artifacts can be found under src/dist/build/distributions.

The following command would compile the application and enable you to run jmeter from the bin directory.

**Note** that it completely refreshes lib/ contents, so it would remove custom plugins should you have them installed to lib/. However, it would keep lib/ext/ plugins intact.

./gradlew createDist

Alternatively, you could get Gradle to start the GUI:

./gradlew runGui

**Developer Information**

Building and contributing is explained in details at [building JMeter](https://jmeter.apache.org/building.html) and [CONTRIBUTING.md](https://github.com/apache/jmeter/blob/master/CONTRIBUTING.md). More information on the tasks available for building JMeter with Gradle is available in [gradle.md](https://github.com/apache/jmeter/blob/master/gradle.md).

The code can be obtained from:

* <https://github.com/apache/jmeter>
* <https://gitbox.apache.org/repos/asf/jmeter.git>

**Licensing and Legal Information**

For legal and licensing information, please see the following files:

* [LICENSE](https://github.com/apache/jmeter/blob/master/LICENSE)
* [NOTICE](https://github.com/apache/jmeter/blob/master/NOTICE)

**Cryptographic Software Notice**

This distribution may include software that has been designed for use with cryptographic software. The country in which you currently reside may have restrictions on the import, possession, use, and/or re-export to another country, of encryption software. BEFORE using any encryption software, please check your country's laws, regulations and policies concerning the import, possession, or use, and re-export of encryption software, to see if this is permitted. See <https://www.wassenaar.org/> for more information.

The U.S. Government Department of Commerce, Bureau of Industry and Security (BIS), has classified this software as Export Commodity Control Number (ECCN) 5D002.C.1, which includes information security software using or performing cryptographic functions with asymmetric algorithms. The form and manner of this Apache Software Foundation distribution makes it eligible for export under the License Exception ENC Technology Software Unrestricted (TSU) exception (see the BIS Export Administration Regulations, Section 740.13) for both object code and source code.

The following provides more details on the included software that may be subject to export controls on cryptographic software:

Apache JMeter interfaces with the Java Secure Socket Extension (JSSE) API to provide

* HTTPS support

Apache JMeter interfaces (via Apache HttpClient4) with the Java Cryptography Extension (JCE) API to provide

* NTLM authentication

Apache JMeter does not include any implementation of JSSE or JCE.