



¿Qué son los Virtual Threads?

Son **hilos ligeros administrados por la JVM**, no por el sistema operativo. A diferencia de los hilos tradicionales (plataforma), los virtual threads:

- ★ No bloquean hilos físicos cuando esperan (como I/O o llamadas HTTP).
- ★ Se pueden crear en grandes cantidades (~millones) sin agotar recursos.
- ★ Son ideales para aplicaciones altamente concurrentes, como APIs REST.

Beneficios en Spring Boot

- ★ Mejor escalabilidad en aplicaciones Web.
- ★ Simplifica el desarrollo manteniendo el modelo **imperativo** (no reactivo).
- ★ Reduce la necesidad de usar frameworks complejos como WebFlux o complejidad con **CompletableFuture**.



Desarrollo de Codelab

The screenshot shows an IDE with a project structure on the left and code in the main editor. The project structure includes:

- virtualthreads-demo
 - .mvn
 - .vscode
 - src
 - main
 - java
 - com
 - example
 - virtualthreads_demo
 - controller
 - DemoController.java
 - VirtualthreadsDemoApplication.java
 - resources
 - static
 - templates
 - application.properties
- test
 - java
 - com
 - example
 - virtualthreads_demo
 - VirtualthreadsDemoApplicationTests.java

The main editor shows the following code:

```
1 spring.application.name=virtualthreads-demo
2
3 server.tomcat.virtual-threads-enabled=true
4 logging.level.com.example=INFO
```

The screenshot shows the 'Thread Group' configuration dialog. The 'Name' field is 'Thread Group'. The 'Comments' field is empty. The 'Action to be taken after a Sampler error' is 'Continue'. The 'Thread Properties' section shows:

- Number of Threads (users): 100
- Ramp-up period (seconds): 10
- Loop Count: ☐ Infinite ☒ 1
- ☒ Same user on each iteration
- ☐ Delay Thread creation until needed
- ☐ Specify Thread lifetime

The screenshot shows the 'HTTP Request' configuration dialog. The 'Name' field is 'Slow API Request'. The 'Comments' field is empty. The 'Basic' tab is selected. The 'Web Server' section shows:

- Protocol (Http):
- Server Name or IP:
- Port Number:
- HTTP Request:
- Path: http://localhost:8080/api/slow
- Content encoding:

The 'Parameters' tab is selected. The 'Send Parameters With the Request' section shows:

Name	Value	URL Encode?	Content-Type	Include Equals?

The screenshot shows the 'Test Plan' sidebar with the following items:

- Test Plan
- Thread Group
- Slow API Request
- View Results in Table
- Summary Report

application.properties 1 x VirtualthreadsDemoApplication.java DemoController.java

virtualthreads-demo > src > main > resources > application.properties

1 spring.application.name=virtualthreads-demo

2

3 server.tomcat.virtual-threads-enabled=false

4 logging.level.com.example=INFO

PROBLEMAS 1 CONSOLA DE DEPURACIÓN SALIDA TERMINAL PUERTOS

2025-06-14T22:08:21.562-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-13] c.e.v.controller.DemoController

2025-06-14T22:08:21.663-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-14] c.e.v.controller.DemoController

2025-06-14T22:08:21.762-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-15] c.e.v.controller.DemoController

2025-06-14T22:08:21.863-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-16] c.e.v.controller.DemoController

2025-06-14T22:08:21.964-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-17] c.e.v.controller.DemoController

2025-06-14T22:08:22.069-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-4] c.e.v.controller.DemoController

2025-06-14T22:08:22.163-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-19] c.e.v.controller.DemoController

2025-06-14T22:08:22.264-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-20] c.e.v.controller.DemoController

2025-06-14T22:08:22.364-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-21] c.e.v.controller.DemoController

2025-06-14T22:08:22.462-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-22] c.e.v.controller.DemoController

2025-06-14T22:08:22.563-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-23] c.e.v.controller.DemoController

2025-06-14T22:08:22.662-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-24] c.e.v.controller.DemoController

2025-06-14T22:08:22.764-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-6] c.e.v.controller.DemoController

2025-06-14T22:08:22.862-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-2] c.e.v.controller.DemoController

2025-06-14T22:08:22.964-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-5] c.e.v.controller.DemoController

2025-06-14T22:08:23.063-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-1] c.e.v.controller.DemoController

2025-06-14T22:08:23.163-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-3] c.e.v.controller.DemoController

2025-06-14T22:08:23.263-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-8] c.e.v.controller.DemoController

2025-06-14T22:08:23.364-05:00 INFO 2376 --- [virtualthreads-demo] [nio-8080-exec-9] c.e.v.controller.DemoController

2025-06-14T22:08:23.463-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-10] c.e.v.controller.DemoController

2025-06-14T22:08:23.562-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-11] c.e.v.controller.DemoController

2025-06-14T22:08:23.661-05:00 INFO 2376 --- [virtualthreads-demo] [io-8080-exec-12] c.e.v.controller.DemoController

2025-06-14T22:09:20.364-05:00 INFO 2376 --- [virtualthreads-demo] [ioShutdownHook] o.s.b.w.e.tomcat.GracefulShutdown

2025-06-14T22:09:20.388-05:00 INFO 2376 --- [virtualthreads-demo] [tomcat-shutdown] o.s.b.w.e.tomcat.GracefulShutdown

[INFO] -----

[INFO] BUILD SUCCESS

[INFO] -----

[INFO] Total time: 08:12 min

[INFO] Finished at: 2025-06-14T22:09:20-05:00

[INFO] -----

¿Desea terminar el trabajo por lotes (S/N)? s