

Java Thread Pools (TPS) and Thread-Safety Miscellaneous (TSM)

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Use thread pools to enable graceful degradation of service during traffic bursts

- ✗ Creating too many threads may cause a denial-of-service (DoS)
- ✓ Bound the number of threads, possibly discarding user requests
- ✓ Use `ExecutorService` to create a thread pool

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https://www.securecoding.cert.org/confluence/display/java/TPS00-J.+Use+thread+pools+to+enable+graceful+degradation+of+service+during+traffic+bursts
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Do not execute interdependent tasks in a bounded thread pool

- ✗ May result in thread-starvation deadlock
- ✓ Threads in a thread pool should be independent

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https://www.securecoding.cert.org/confluence/  
display/java/TPS01-J.+Do+not+execute+  
interdependent+tasks+in+a+bounded+thread+pool
```

Ensure that tasks submitted to a thread pool are interruptible

- ✗ Don't let those threads occupy the pool forever!
- ✓ Only add interruptible tasks to the pool

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https://www.securecoding.cert.org/confluence/  
display/java/TPS02-J.+Ensure+that+tasks+submitted+  
to+a+thread+pool+are+interruptible
```

Do not override thread-safe methods with methods that are not thread-safe

- ✗ Overriding synchronized methods is tricky
- ✓ Synchronize the overriding method

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https://www.securecoding.cert.org/confluence/  
display/java/TSM00-J.+Do+not+override+thread-safe+  
methods+with+methods+that+are+not+thread-safe
```

Do not use background threads during class initialization

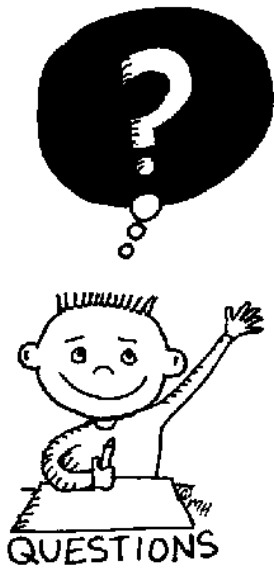
- ✗ May result into initialization cycles and deadlock
- ✓ Perform all initialization steps in the main thread

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https://www.securecoding.cert.org/confluence/  
display/java/TSM02-J.+Do+not+use+background+  
threads+during+class+initialization
```

Do not publish partially initialized objects

- ✗ May happen if fields are initialized out of the constructor
- ✓ Synchronize the initialization method
- ✓ Just permit two worlds: fully initialized, or not initialized at all

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https://www.securecoding.cert.org/confluence/  
display/java/TSM03-J.+Do+not+publish+partially+  
initialized+objects
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