

Dirty Hacks With Java Reflection (includes one or two useful hints)

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Javaspecialists.eu
java training

Short Introduction to Speaker

- **Heinz Kabutz**

- Born in Cape Town, South Africa, now live on Crete
- PhD Computer Science from University of Cape Town
 - University famous for world's first successful heart transplant

- **Created The Java Specialists' Newsletter**

- Monthly advanced newsletter for Java professionals
- <http://www.javaspecialists.eu>

- **One of the first Java Champions**

- <https://java-champions.dev.java.net/>





Reflection is like Opium

- **A bit too strong for every day use**
 - But can relieve serious pain
- **Please do not become a reflection addict!**

Modifying/Reading Private/Final Fields

- **We can access private fields by making it accessible**
 - Requires security manager support
- **Note: value field is final and private!**

```
import java.lang.reflect.*;
```

```
public class PrivateFinalFieldTest {  
    public static void main(String... args)  
        throws NoSuchFieldException, IllegalAccessException {  
        Field value = String.class.getDeclaredField("value");  
        value.setAccessible(true);  
        value.set("hello!", "cheers".toCharArray());  
        System.out.println("hello!");  
    }  
}
```

cheers

Optimization methodology

- 1. Load test to identify bottlenecks**
 - Identify the easiest to fix
 - 2. Derive a hypothesis for the cause of the bottleneck**
 - Create a test to isolate the factor identified by the hypothesis
 - This is important, we have often been fooled by profilers!
 - 3. Alter the application or configuration**
 - 4. Test that the change improves the situation**
 - Also make sure the system still works correctly
- Repeat process until targets are met

Big Gains Quickly

- **Amdahl's law applies**

- **Consider an 4 layered application**

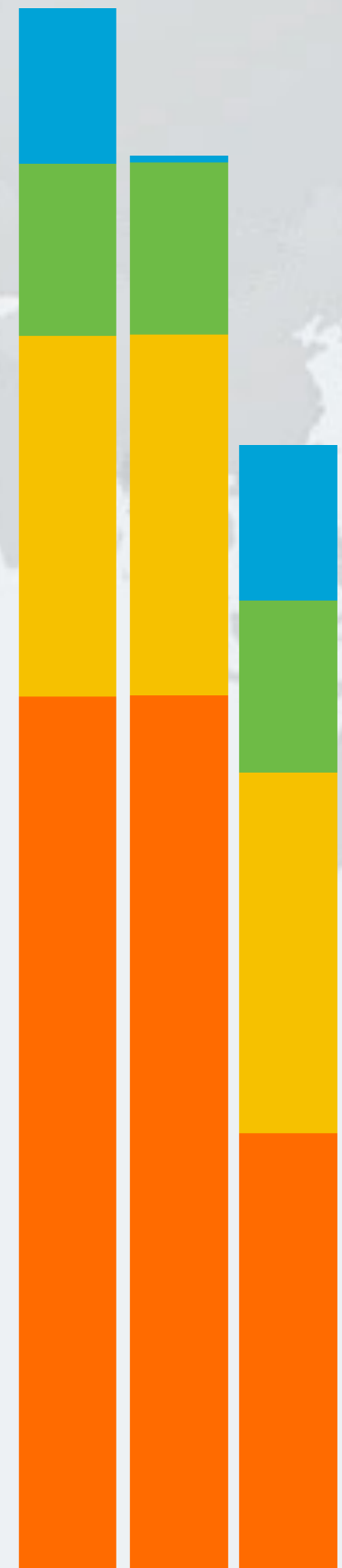
- **Servlet takes 10%**
- **Business component takes 11%**
- **EJB takes 23%**
- **SQL takes 56%**

- **Scenario 1, tuning Servlet gives 20x improvement**

- **"Google" says that servlets are slow**
- **$0.10/20 + 0.11/1 + 0.23/1 + 0.56 /1 = 0.905$**

- **Scenario 2, tuning SQL give 2x improvement**

- **We *measure* and discover SQL is the bottleneck**
- **$0.10/1 + 0.11/1 + 0.23/1 + 0.56/2 = 0.72$**



System Overview - The Box

People

Usage Patterns,
Rates

Application

Lock Contention

JVM

Garbage Collector,
Number of Threads

Hardware

CPU, Memory,
Disk, Network



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