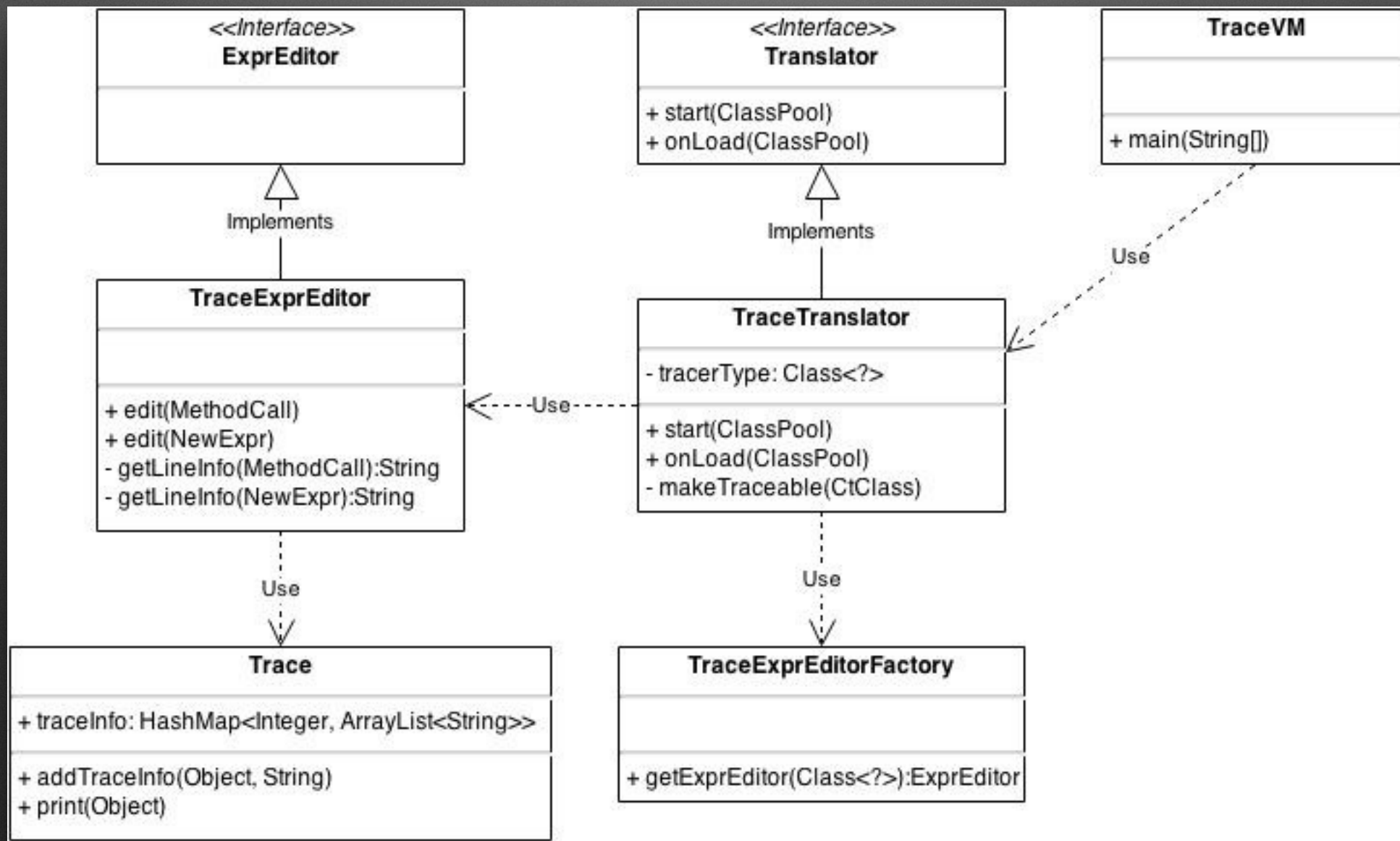


# Tracer for Java

Miguel Abreu Belo  
Bruno Filipe Ferreira  
Afonso Falardo Garcia



# Tracer for Java





# Tracing Method Calls



- Tracer doesn't trace calls inside *ist.meic.pa.Trace*
- Arguments: code inserted before calling the method
- Return object: code inserted before calling the method



# Tracing Method Calls



TÉCNICO  
LISBOA

```
public static void main(String[] args) {  
    String[] t = new String[2];  
    t[0] = "Ola";  
  
    String s = getString(t, 0);  
  
    Trace.print(t);  
    Trace.print(s);  
}  
  
public static String getString(String[] val, int pos) {  
    return val[pos];  
}
```

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVM Test3  
Tracing for [Ljava.lang.String;@712c20d9  
-> Test3.getString(java.lang.String[],int) on Test3.java:9  
-> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:11  
Tracing for Ola  
<- Test3.getString(java.lang.String[],int) on Test3.java:9  
-> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:12  
Daenerys:Trace agfrg$
```



# Tracing New Expr.

- Tracer doesn't trace new expressions inside *ist.meic.pa.Trace*
- Arguments: code inserted before calling the constructor
- Return object: code inserted after calling the constructor



# Tracing New Expr.

```
public static void main(String[] args) {  
    String s = new String("Ola");  
  
    Trace.print(s);  
}
```

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVM Test3  
Tracing for Ola  
  <- java.lang.String(java.lang.String) on Test3.java:6  
  -> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:8  
Daenerys:Trace agfrg$
```



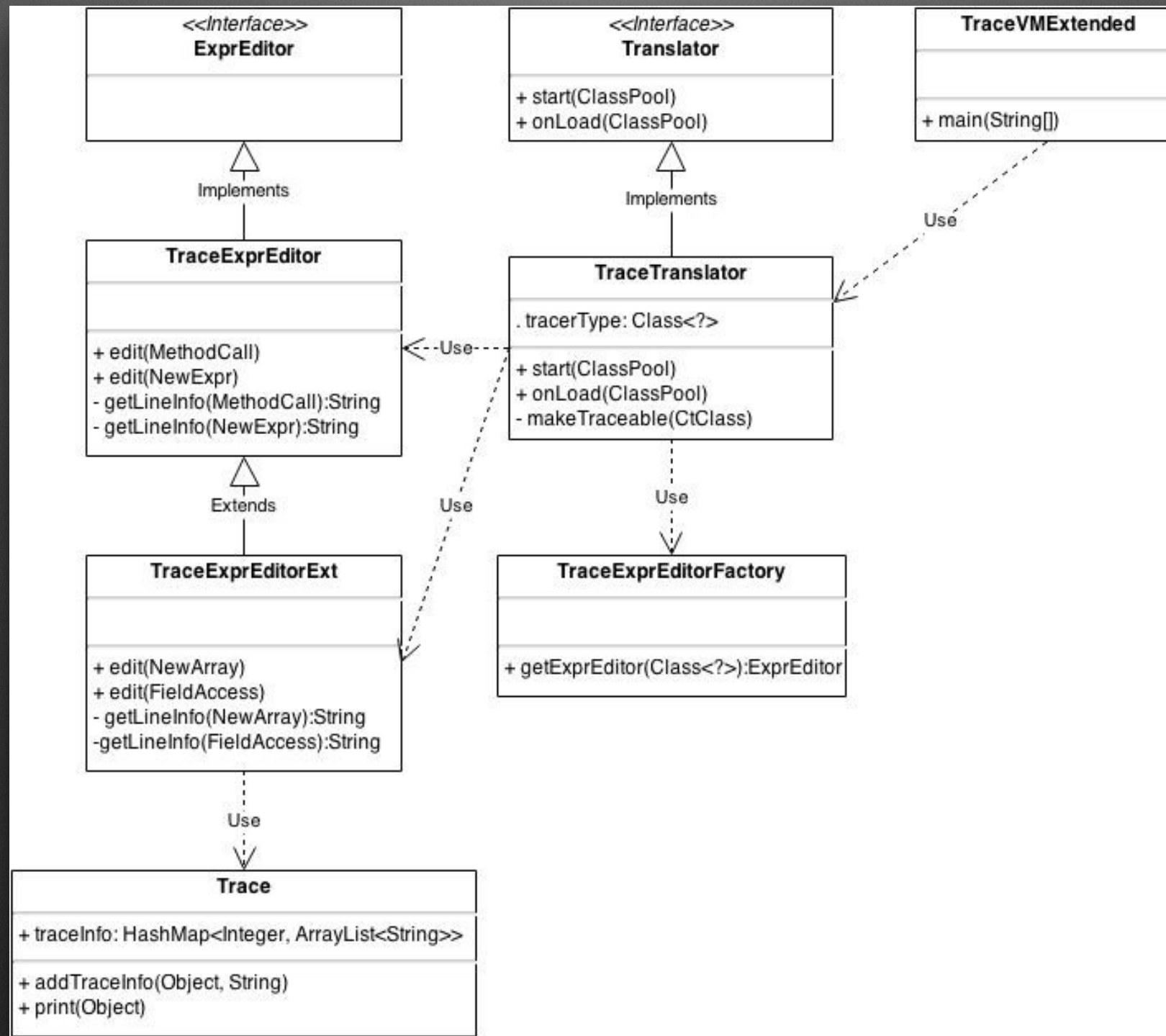
# Other Details

- Traced objects: native arrays and Objects
- Traces everywhere inside a class
- Arrays are printed with the default toString() method

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVM Test3
Tracing for [Ljava.lang.String;@45d63c55
  -> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:27
Daenerys:Trace agfrg$ █
```



# Extended Tracer





# Array Print

- Displays the content of the array in the format `[ o ... ]`
- Iterates over the array in order to convert it to a string

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVMExtended Test3
Tracing for [ Ola null ]
  <- java.lang.String[] on Test3.java:25
  -> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:27
Daenerys:Trace agfrg$ █
```



# Tracing New Arrays

- Tracer doesn't trace new expressions inside *ist.meic.pa.Trace*
- Code after calling the array constructor



# Tracing New Arrays

```
public static void main(String[] args) {  
    String[] t = new String[2];  
    t[0] = "Ola";  
    Trace.print(t);  
}
```

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVMExtended Test3  
Tracing for [ Ola null ]  
  <- java.lang.String[] on Test3.java:6  
  -> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:8  
Daenerys:Trace agfrg$ █
```



# Tracing Field Access

- Tracer doesn't trace calls inside *ist.meic.pa.Trace*
- Reading: code is inserted after the call
- Writing: code is inserted before the call



# Tracing Field Access

```
class T {  
    String a;  
  
    public T(String a) {  
        this.a = a;  
    }  
}  
  
public class Test3 {  
  
    public static void main(String[] args) {  
        T t = new T("Ola");  
        Trace.print(t);  
    }  
}
```

```
Daenerys:Trace agfrg$ java -cp tracer.jar ist.meic.pa.TraceVMExtended Test3  
Tracing for T@178374c9  
-> a on Test3.java:7  
<- T(java.lang.String) on Test3.java:14  
-> ist.meic.pa.Trace.print(java.lang.Object) on Test3.java:15  
Daenerys:Trace agfrg$
```



# Tracer for Java

Questions?