



The Free Javaws Implementation in IcedTea

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Overview of the Talk

- Background about JNLP
- Netx's Architecture
- Recent developments in Netx
- Future



Background



What's the name again?

- Java Network Launching Protocol
- Java Web Start

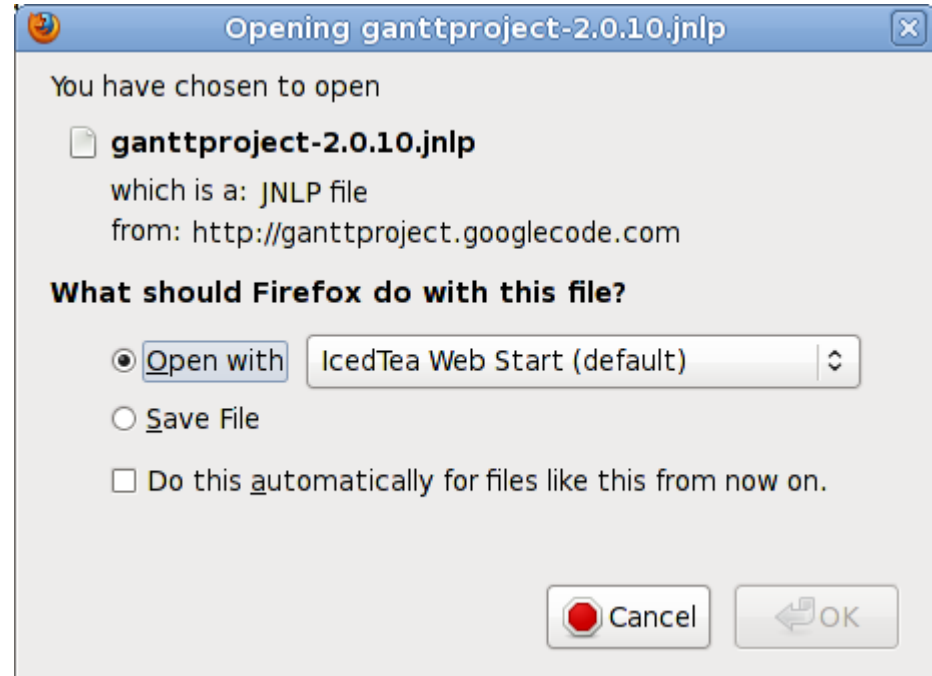
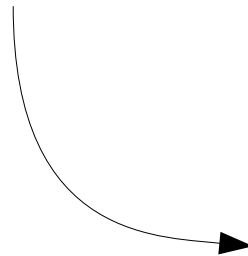


Overview of JNLP

A way to run Java applications
securely without installing them



Running JNLPs - Hyperlinks



Running JNLPs – Command Line

```
$ javaws ganttproject-2.0.10.jnlp
```



The Standard

License Agreement for JSR-000056 Java Network Launching Protocol and API 6.0.18

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Specification: JSR-000056 Java(tm) Network Launching Protocol and API ("Specification")

Version: 6.0.18

Status: Maintenance Release 3

Release: 25 January 2010

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Other Resources

- Java Deployment Documentation
 - http://download.oracle.com/javase/6/docs/technotes/guides/jweb/deployment_advice.html#deployingApplications
- Existing JNLP Applications



JNLP Application



XML File



Jars



JNLP File Example

```
<?xml version="1.0" encoding="utf-8"?>
<jnlp spec="1.0"
      codebase="."
      href="AddShutdownHook.jnlp">
  <information>
    <title>test adding shutdown hooks</title>
  </information>
  <resources>
    <jar href="AddShutdownHook.jar" main="true" download="eager"/>
  </resources>
  <application-desc main-class="AddShutdownHook"/>
</jnlp>
```



Demo

- Show JNLP File
- Show Code
- Run



Netx



- What Is It?
- Architecture
- Components in Depth
- Netx and the Plugin



Netx

Netx

- Originally at <http://jnlp.sourceforge.net/netx/>
 - Last updated in 2003
- Designed as a library
- About 18k lines of Java



Netx

- Imported into IcedTea in 2008

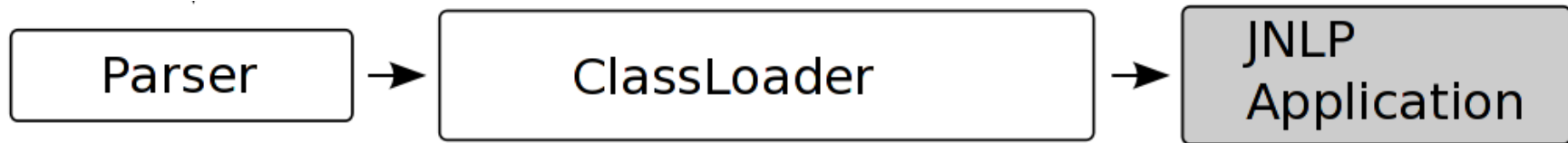
```
changeset: 437:bb4e2512ea29
user:      Joshua Sumali <jsumali@redhat.com>
date:      Wed Jan 09 14:22:14 2008 -0500
files:     ChangeLog Makefile.am Makefile.in README configure configure.ac patches/icedtea-j
description:
2008-01-09 Joshua Sumali <jsumali@redhat.com>
```

```
* Makefile.am: Added building of NetX as our drop-in replacement for
javaws. Since upstream NetX is dormant, we will be hosting and modifying
the NetX source in this repository, particularly in the new tools
directory. The old tools directory which was used in building the
bootstrap/jdk1.7.0 tools.jar during the build has been renamed to
hotspot-tools.
```

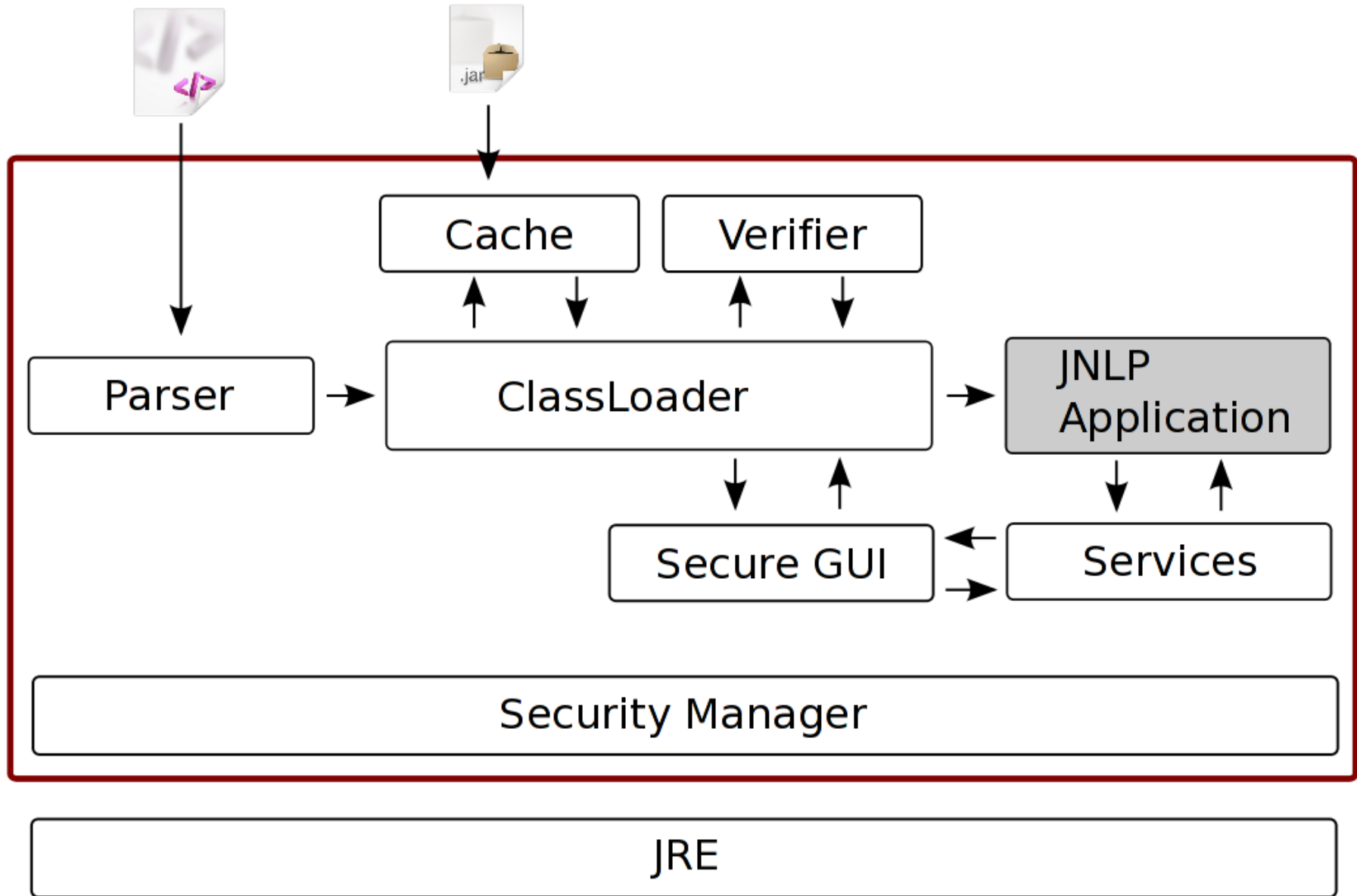
- The default javaws implementation in most distributions
- About 27k lines of code



Overall Architecture



Overall Architecture

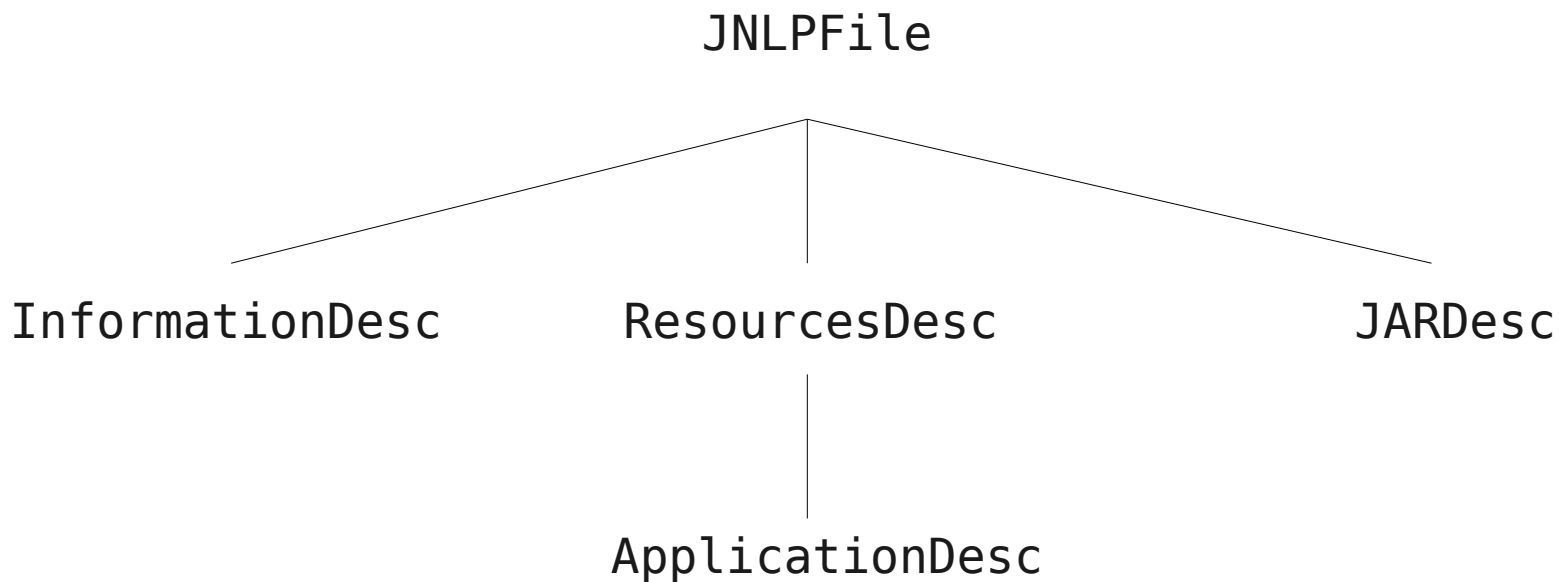


Parser

Parses a JNLP (an XML file) and converts it into a set of java objects



```
<?xml version="1.0" encoding="utf-8"?>
<jnlp spec="1.0"
  codebase="."
  href="AddShutdownHook.jnlp">
  <information>
    <title>test adding shutdown hooks</title>
  </information>
  <resources>
    <jar href="AddShutdownHook.jar" main="true" download="eager"/>
  </resources>
  <application-desc main-class="AddShutdownHook"/>
</jnlp>
```



Parser

- The main class is `net.sourceforge.jnlp.Parser`
- Most of the code is under `net.sourceforge.jnlp`
- Elements are named `<element>Desc`



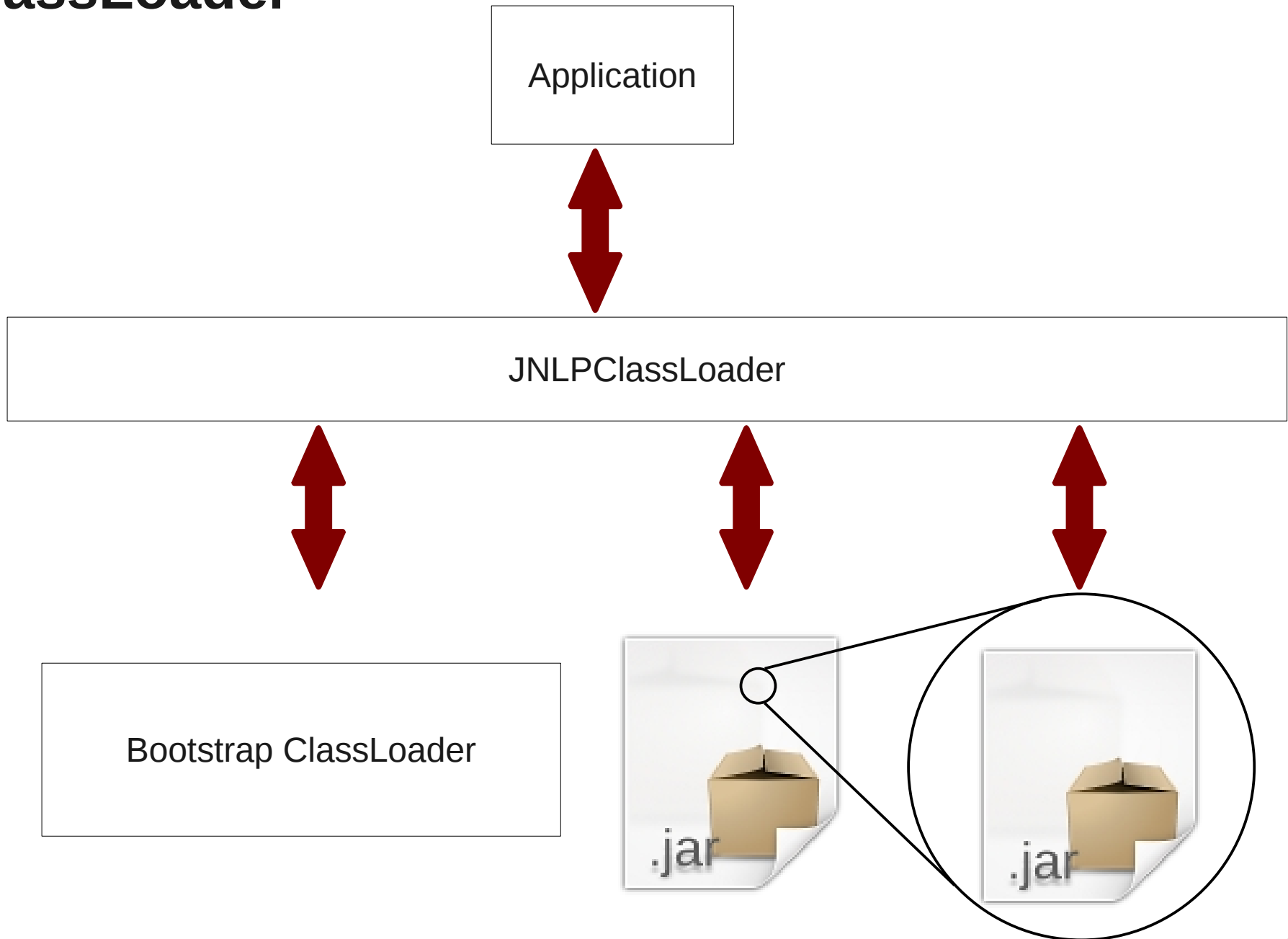
Parser

Uses (in-tree) NanoXML to parse

... and lives with the consequences



ClassLoader



ClassLoaders - Lazy

Download Jars only when needed



ClassLoader - Security

Along with loading classes, associates permissions with them



Cache

- Recall that applications are not installed
- File are cached in `~/.icedtea/cache/`

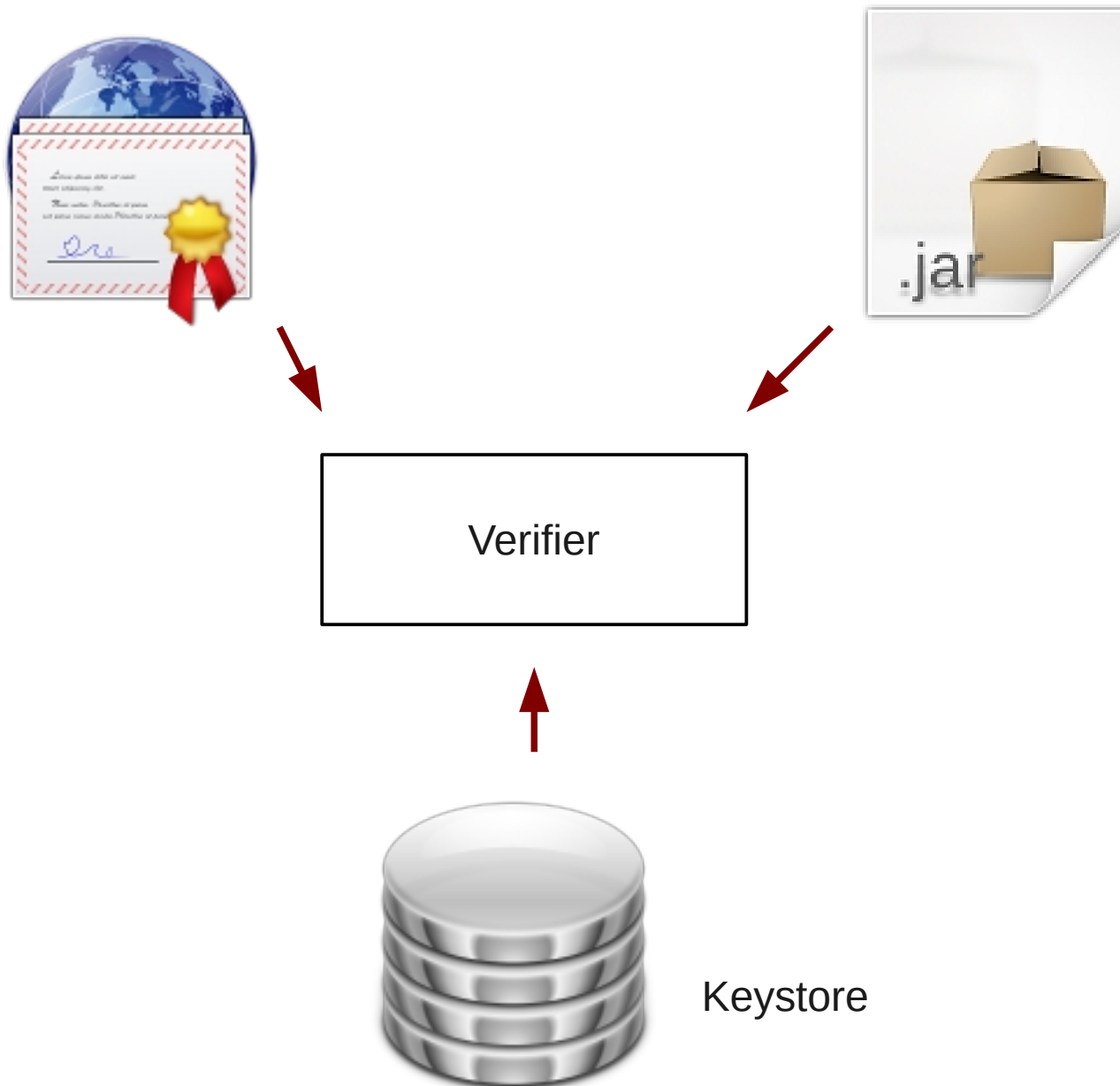


Cache - Downloading

- Multiple threads spawned
- Each file goes through multiple states to arrive at
 - Error
 - Or Downloaded



Verifier



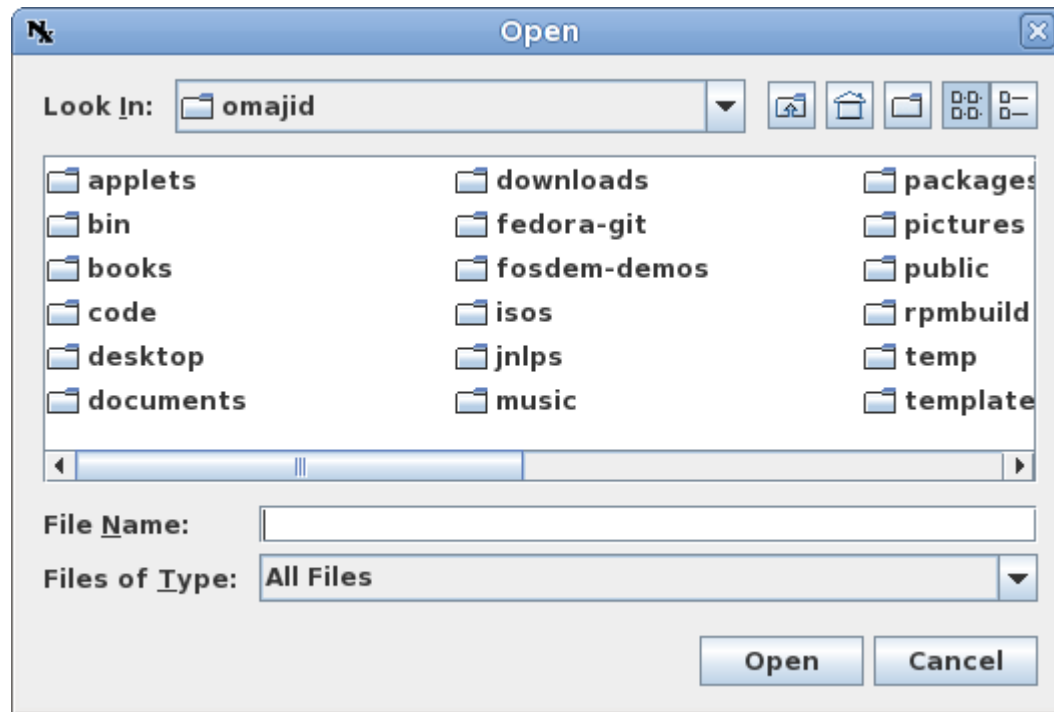
Services

Allow unsigned applications to break the sandbox (securely)



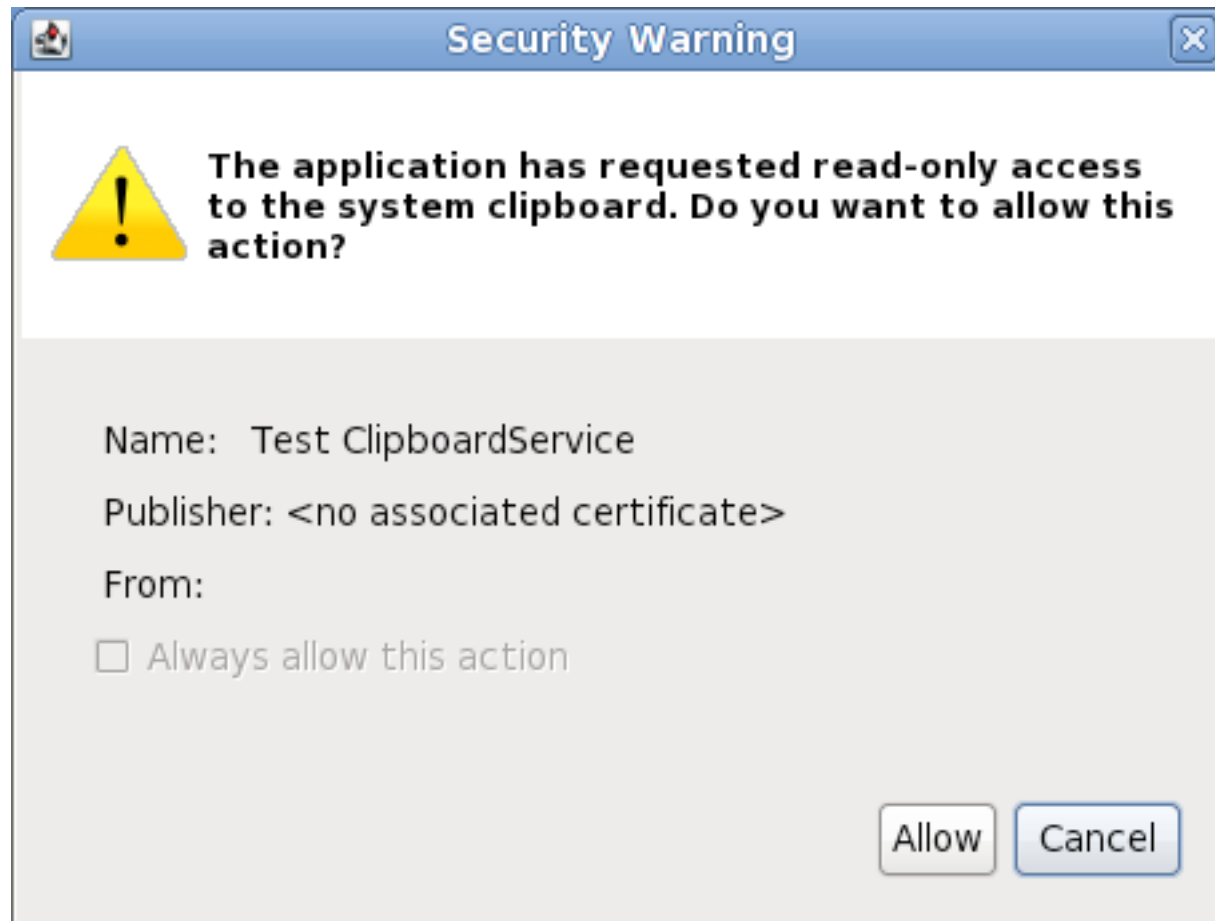
Services

Access to Files

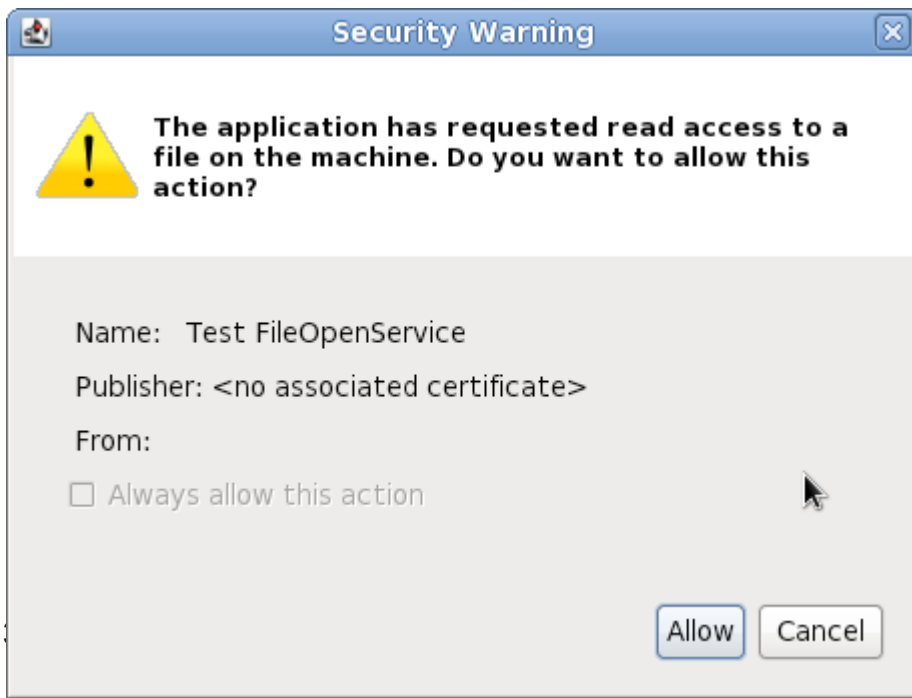
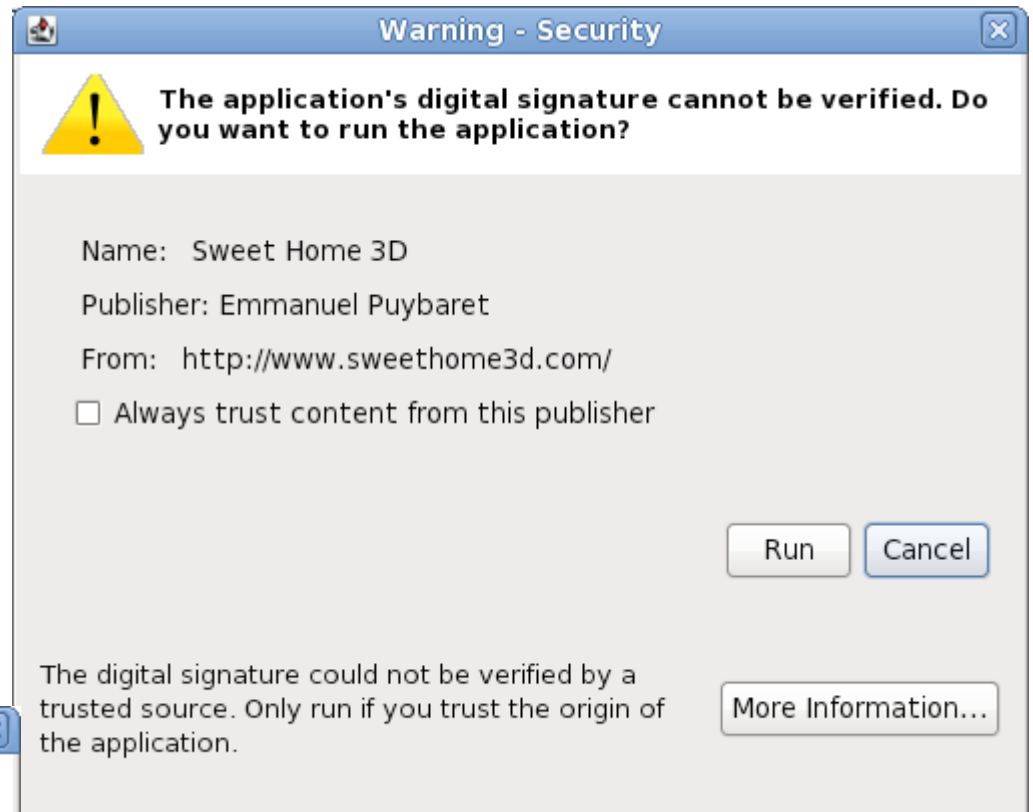


Services - Integration





Secure GUI



Security Manager



- Custom security manager
- Allows some permissions
- Custom policy can be defined



Security/ClassLoader/Verifier Demo



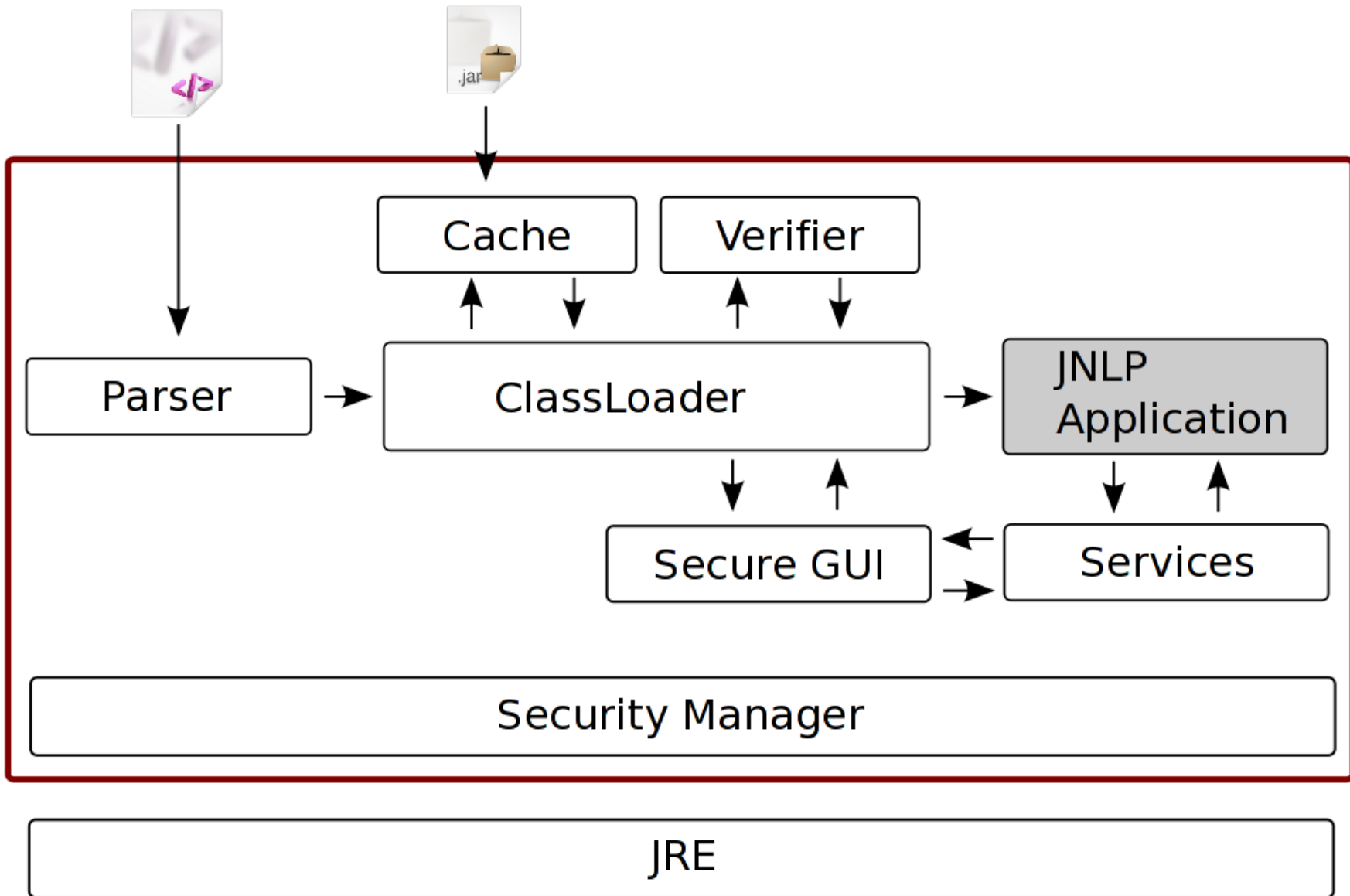
Service Demo



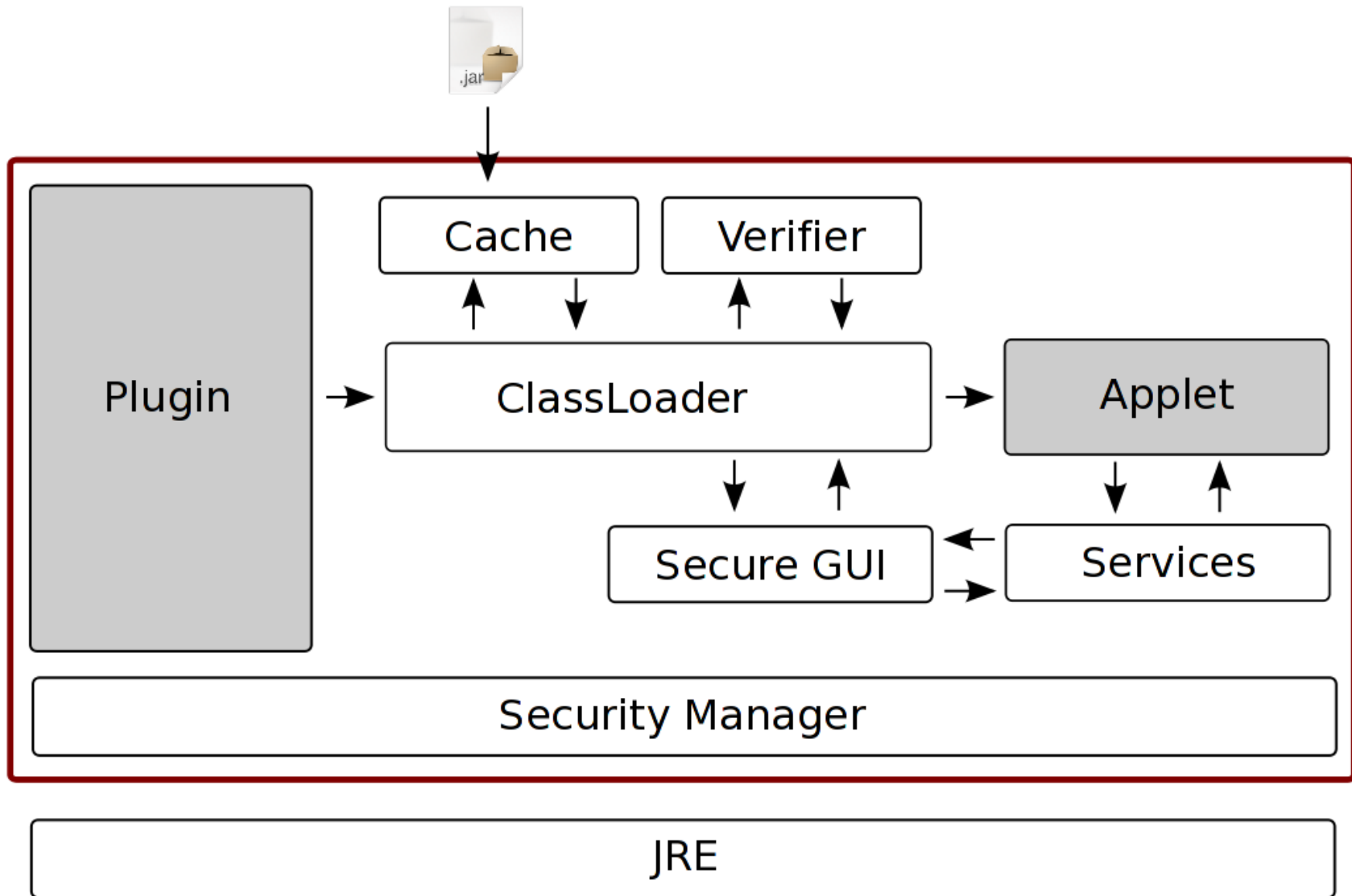
Netx and the Plugin

The plugin relies on Netx for most of its non browser functionality





Plugin in the component framework



Recent Developments in Netx



Versioned/Packed Jars – Sever Side

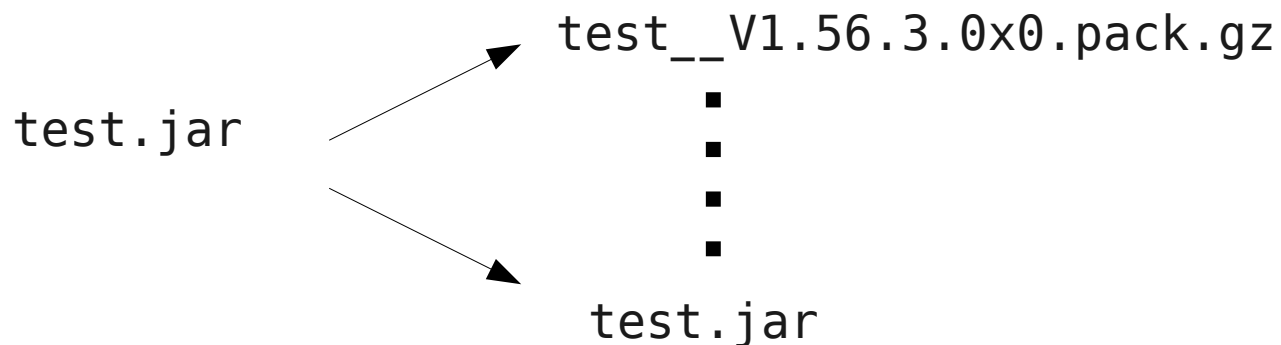
- Server-side
 - content-encoding
 - version-id



Versioned/Packed Jars – Client Side

```
<?xml version="1.0"?>
<jnlp spec="1.0+" codebase="https://server/">
  <information>
    <title>test</title>
  </information>

  <resources>
    <jar href="test.jar" download="eager" main="true" version="1.56.3.0x0"/>
    <property name="jnlp.packEnabled" value="true"/>
    <property name="jnlp.versionEnabled" value="true"/>
  </resources>
</jnlp>
```



Support for deployment.properties

- Allows configuring almost every part of netx
- Described at
 - <http://download.oracle.com/javase/6/docs/technotes/guides/deployment/deployment-guide/contents.html>



Deployment.properties

- Located at `~/.icedtea/deployment.properties`
- Key-value pairs in the standard properties file format



Proxy Support

- Read proxy settings from deployment.properties
- Or Firefox's preferences



Custom Policies

- Possible to sandbox trusted applications
- Possible to grant untrusted applications some permissions



TagSoup-based Parser

- Instead of a XML parser, use a html parser

```
<resources>  
  <jar href="test.jar" download="eager"  
</resources>
```



The Future



- Better compatibility
- Implement missing JNLP API services
- Use libproxy
- Better system integration
- Stuff Deepak mentioned...



Questions

