

Initial Report

16 Onions

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1 General

We are the team “16 Onions” consisting of Josef Stark and Charlie Groh, and our goal is to develop a prototype implementation of the Onion module.

2 Programming Language and Operating System

Since the anonymity of a person using the VoIP application depends on the number of other users, it is important that it is as simple as possible to port the software to nearly every environment. Therefore we decided to use Java 7 as programming language and Linux as operating system. Although we think that the module should be able to run on every operating system, though we will not test it on other systems than Linux. Another advantage of Java are the built in safety mechanisms preventing common memory corruption vulnerabilities.

3 Build System

As development environment we will use Eclipse on a Debian GNU/Linux system. For writing the reports, LaTeX will be utilized. The exact versions will vary among the different workstations of the team members. Eclipse does a good job at handling dependencies and incremental builds for reduced build times, so most of the time we will just rely on the IDE to do the compiling. But in order to also be able to build the project from the command line (e.g. building on a server with no graphical interface available), we will regularly save an ant build file. This can be done easily in eclipse by right clicking on the project and then

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selecting “Export” - “General” - “Ant buildfiles”. This file, which will reside in the project root folder, can then be interpreted by the command line tool ant independently of Eclipse.

We think that the Unit-Test-Framework of Java will do a good job in testing single modules for API- and protocol-conformance. For testing the API conformance we will use <https://gitlab.lrz.de/voidphone/testing>, which is provided by the course instructors. For testing the behaviour of many instances of the module the network virtualizer Mininet will be used.

<http://halyph.blogspot.de/2011/08/java-code-quality-tools-overview.html>

4 Libraries

Java 7 already ships a pretty big standard library, which will probably provide most of the functionality required for implementing the Onion module. For advanced functionality we might have to use 3rd party libraries, but whenever possible it would be preferable to avoid this as it reduces portability and ease of use. The following functional requirements have been identified so far, along with libraries providing it:

- TCP communication: `java.net.Socket` (integrated)
- UDP communication: `java.net.DatagramSocket` (integrated)
- INI config file handling: May be possible with `java.util.Properties` (integrated), if not, we could use <http://ini4j.sourceforge.net/> (3rd party) or implement it ourselves.
- Transferring data/objects: `java.io.Serializable` (integrated), <https://x-stream.github.io/> (3rd party but human-readable and more compact), <https://github.com/google/gson> (same with JSON) or implementing our own protocol (more effort but probably more efficient)
- Cryptography: `java.security`, `javax.crypto` (integrated) or <https://www.bouncycastle.org/> (3rd party, more functionality)

5 License

Our programming work will be released under the GNU Public License, because we believe it is necessary to release privacy/anonymity related applications as open source software. Firstly it should be simple for external researchers to audit the software in order to find possible security holes. Secondly users should be able to verify that there are no backdoors or information leakages. Thirdly we hope that our development can help others with their own projects, and therefore we decided to use the widespread GPL license.

Due to the same reasons we will place every documentation and report under the GNU Free Documentation License Version 1 or Creative Commons

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6 Previous Programming Experience

Both team members learned Java as their first programming language at school and used it in several bigger projects. Therefore we are familiar in using internal and external libraries, sending and receiving data in various protocols by using sockets and testing using unit tests.

7 Work Sharing Strategies

We will share the programming work by dividing it in smaller pieces and weighting it with the expected workload. Then the pieces will be assigned to the team members ensuring that every member gets a similiar workload. Additionally we will meet at least two times per week to discuss implementation and integration problems and wrongly weighted pieces.

The reports will be written in the same manner as the programming is done. We will try to assign every report piece to that team member who programmed the respective software piece.

8 Issues and Complains

Until now we did not discover any issues or complains concerning the project and hope this will last.