



# Review report of a final thesis

**Student:** Bc. Matej Matula  
**Reviewer:** Ing. Tomáš Zahradnický, Ph.D.  
**Thesis title:** SFTP Proxy for AWS S3  
**Branch of the study:** Web and Software Engineering

**Date:** 23. 8. 2020

*Evaluation criterion:*

*The evaluation scale: 1 to 4.*

## 1. Fulfilment of the assignment

**1 = assignment fulfilled,**  
**2 = assignment fulfilled with minor objections,**  
**3 = assignment fulfilled with major objections,**  
**4 = assignment not fulfilled**

*Criteria description:*

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

*Comments:*

The thesis fulfills requirements for a diploma thesis. I find its objective met.

*Evaluation criterion:*

*The evaluation scale: 0 to 100 points (grade A to F).*

## 2. Main written part

65 (D)

*Criteria description:*

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies? Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 26/2017, Art. 3. Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

*Comments:*

Structure of the thesis. The thesis could have been structured better. Introduction made of 1 paragraph spanning through 2 pages is hard readable. A similar lack of paragraph splitting intertwines throughout the thesis. Next, there are 2 chapters which would be better suited for an appendix rather. The real thesis starts on page 15.

Images. Images in the thesis have inconsistent styles. Some sequence diagrams are colored and have very different styles from monochrome sequence diagrams. This makes me think they are somewhat different.

Security. The thesis does not contain a part where it would discuss the key life cycle management, nor it apparently operates with the Java Key Store. Private keys are expected to be stored in files at a java classpath location. This is a practice I do not agree with. I prefer to store private keys at secured locations from which they are not easily extracted. What happens to the private key in the JVM heap when it is no longer necessary? (See question #2 below).

Tests. The student tries to test his implementation by comparing transfer speed using a benchmark and by using unit tests. I would appreciate had the student described more precisely how he measured time along with standard deviation of each measured result. Transferring a 5 MiB file for 115 s is not only unbearably slow but also suspicious. The reasoning on pages 48 and 49 is in my opinion insufficient.

Typography and Language. I find typography of the thesis below an average. I see words running out from the page mirror (pg. 8, 35, 37, and 58), misspellings such as overheat vs overhead (cf. table 6.6 on pg. 61 or subsection 6.4.5 name) or the authorized\_keys file name (pg. 6). Units are written very inconsistently across the thesis; once with a space after the quantity once without it, once with a capital letter once not. Gigabits (?gb) are thus confused with gibibytes (GiB) (pg. 56), or milibits (mb) with megabytes (MiB) (pg. 57). I miss articles such as here: "generates >>an<< MD5 hash". Content is quoted using a wrong set of quotes, with a pair of upper 99 quotes, instead of an opening quote (upper 66) and a closing one (upper 99).

Bibliography. The bibliography is inconsistent. Some authors are missing, some authors' names are written in capital letters.

<i>Evaluation criterion:</i>	<i>The evaluation scale: 0 to 100 points (grade A to F).</i>
<b>3. Non-written part, attachments</b>	<b>85 (B)</b>
<i>Criteria description:</i> Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.	
<i>Comments:</i> I do not find any comments in the source code, or file headers. It is difficult to tell which file is a student's work and which not.	
<i>Evaluation criterion:</i>	<i>The evaluation scale: 0 to 100 points (grade A to F).</i>
<b>4. Evaluation of results, publication outputs and awards</b>	<b>75 (C)</b>
<i>Criteria description:</i> Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.	
<i>Comments:</i> Though it may be useful to use the proxy, I am worried a little about security. I have not find a note about how keys are destroyed in the JVM heap after being used. Also I would expect the proxy to be compatible with the Java Key Store and with ssh key store and configuration files in /.ssh.	
<i>Evaluation criterion:</i>	<i>No evaluation scale.</i>
<b>5. Questions for the defence</b>	
<i>Criteria description:</i> Formulate questions that the student should answer during the Presentation and defence of the FT in front of the SFE Committee (use a bullet list).	
<i>Questions:</i> 1. Does the proxy support loading private keys from a secured location such as the Java Key Store? 2. How do you wipe private keys from the JVM heap after being used in the proxy? 3. The file transfer benchmark only tests up to 200 files being transferred in a total size of 2 GiB. What is the reasoning beyond choosing up to 200 files? (A software project might have easily 10000s of files). 4. One of the results describes a file transfer of a 5 MiB file taking over 115 s. Have you used a profiler or similar performance monitoring tool to discover where the bottleneck resides?	
<i>Evaluation criterion:</i>	<i>The evaluation scale: 0 to 100 points (grade A to F).</i>
<b>6. The overall evaluation</b>	<b>70 (C)</b>
<i>Criteria description:</i> Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.	
<i>Comments:</i> I do recommend the diploma thesis of Mr. Matula for defense and grade it with C (good).	

Signature of the reviewer: