

Distributed Systems – Assignment 3

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ABSTRACT

Concisely state (i) which Android device you used, (ii) which tasks you completed and which are working correctly or limited, and (iii) what your specific enhancements are.

1. INTRODUCTION

Use the introduction for background information on the assignment.

- Please give an overview of the usage of the Lamport times and of the Vector Clocks.
- Also write about your architecture to handle the UDP communication.

Use references such as books [2], papers and theses [4], or specifications [3] whenever available. Web sites for documentation [1], tutorials, etc. are a special case. In a thesis, you would put them as footnotes. At this stage, however, you will only have a few “real references,” so we put the Web sites into the bibliography. Cite every source you used throughout the assignment.

2. LAMPORT TIMESTAMPS

- Describe shortly, how you designed your application to implement this task. Include 1-2 screenshots of your app.
- Highlight the backbone of your implementation (methods) and add a state transition diagram to describe the logic behind the handling of communication with the server. Especially, describe how you designed the `isDeliverable(...)` method.
- Describe the main problem encountered in this task and give an overview of your solution.

3. VECTOR CLOCKS

- Did you reuse elements from Task 2? Highlight the main differences to Task 2.
- Describe how you designed the `isDeliverable(...)` method.
- Describe the main problem encountered in this task and give an overview of your solution.

4. DISCUSSION

Please reply to the following questions.

- What are the main advantages of using Vector Clocks over Lamport Timestamps?
- When exactly are two Vector Clocks causally dependent?

- We decided in the exercise that we would not let our applications trigger a tick when receiving a message. What would be the implications of ticking on receive?
- Does a clock tick happen before or after the sending of a message. What are the implications of changing this?
- Read and assess the paper Tobias Landes - Dynamic Vector Clocks for Consistent Ordering of Events in Dynamic Distributed Applications³ that gives a good overview on the discussed methods. In particular, which problem of vector clocks is solved in the paper?

5. CONCLUSION

Give an overall conclusion that summarizes the main challenges you encountered, your lessons learned and how you divided the work load in your team.

6. REFERENCES

- [1] Services: Sending Notifications to the User. <http://developer.android.com/guide/components/services.html#Notifications>. Accessed on 29 Aug 2013.
- [2] E. Burnette. *Hello, Android: introducing Google's mobile development platform*. Pragmatic Bookshelf, 3 edition, 2010.
- [3] R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, and T. Berners-Lee. Hypertext Transfer Protocol – HTTP/1.1. RFC 2616, 1999.
- [4] R. T. Fielding. *Architectural Styles and the Design of Network-based Software Architectures*. Phd thesis, UC Irvine, 2000.