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A complete system integration of stream-based IP flow-record querier

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Masters Thesis

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ABSTRACT

Short summary of the contents in English...

*We have seen that computer programming is an art,
because it applies accumulated knowledge to the world,
because it requires skill and ingenuity, and especially
because it produces objects of beauty.*

— ? [?]

ACKNOWLEDGMENTS

Put your acknowledgments here.

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Part I

INTRODUCTION

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TRAFFIC MEASUREMENT APPROACHES

1.1 CAPTURING PACKETS

1.2 CAPTURING FLOWS

1.3 REMOTE MONITORING

1.4 REMOTE METERING

FLOW EXPORT PROTOCOLS

2.1 NETFLOW

2.2 IPFIX

2.3 SFLOW

LANGUAGES AND TOOLS

3.1 NFDUMP

3.2 FLOW-TOOLS

3.3 GIGASCOPE

LEGAL CONSIDERATION

Part II

MOTIVATION

Part III

STATE OF THE ART

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FLOWY

5.1 PROCESSING PIPELINE

5.1.1 *Splitter*

5.1.2 *Filter*

5.1.3 *Grouper*

5.1.4 *Group-Filter*

5.1.5 *Merger*

5.1.6 *Ungrouper*

5.2 PYTHON FRAMEWORK

5.2.1 *PyTables and PLY*

5.2.2 *Records*

5.2.3 *Filters and Rules*

5.2.4 *Branches and Branch Masks*

FLOWY IMPROVEMENTS USING MAP/REDUCE

FLOWY: APPLICATIONS

8.1 IPV6 TRANSITION FAILURE IDENTIFICATION

8.2 CYBERMETRICS: USER IDENTIFICATION

8.3 APPLICATION IDENTIFICATION USING FLOW SIGNATURES

Part IV

WORK PLAN

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PERFORMANCE EVALUATION

CONCLUSION

Part V

IMPLEMENTATION AND EVALUATION

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FUTURE WORK

CONCLUSION

Part VI

APPENDIX



APPENDIX

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COLOPHON

This thesis was typeset with $\text{\LaTeX} 2_{\epsilon}$ using Hermann Zapf's *Palatino* and *Euler* type faces (Type 1 PostScript fonts *URW Palladio L* and *FPL* were used). The listings are typeset in *Bera Mono*, originally developed by Bitstream, Inc. as "Bitstream Vera". (Type 1 PostScript fonts were made available by Malte Rosenau and Ulrich Dirr.)

The typographic style was inspired by ?'s genius as presented in *The Elements of Typographic Style* [?]. It is available for \LaTeX via CTAN as "**thesis**".

NOTE: The custom size of the textblock was calculated using the directions given by Mr. Bringhurst (pages 26–29 and 175/176). 10 pt Palatino needs 133.21 pt for the string "abcdefghijklmnopqrstuvwxyz". This yields a good line length between 24–26 pc (288–312 pt). Using a "double square textblock" with a 1:2 ratio this results in a textblock of 312:624 pt (which includes the headline in this design). A good alternative would be the "golden section textblock" with a ratio of 1:1.62, here 312:505.44 pt. For comparison, DIV9 of the typearea package results in a line length of 389 pt (32.4 pc), which is by far too long. However, this information will only be of interest for hardcore pseudo-typographers like me.

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DECLARATION

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Bremen, Germany, June 2012

Vaibhav Bajpai