

A Tutorial on Network and Data Analysis Framework for Industrial Internet of Things

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Abstract—The paper presents a hands-on tutorial to develop a robust near real-time high volume sensor data acquisition and analysis framework. The hardware used in this tutorial are based on open-source platforms like Arduino and Raspberry-Pi Single Board Computer. The framework has been developed at RBCCPS, IISc Bangalore and consists of 1) a model network architecture, 2) hardware 3) software micro-services to provide data storage, aggregation, and stream processing. The framework is being used at RBCCPS to acquire data remotely from a Surface Mount Technology (SMT) circuit board soldering assembly line which is situated about 150Km from our research facility. The volume of data collected daily varies from 5GB to 15GB. The framework uses software modules based on python, ruby and nodejs. Other software tools used include Mosquitto MQTT Broker, Norikra stream processor, node HTTP proxy server, Elasticsearch timeseries database for storage, Kibana and Freeboard for data visualisation and annotation of data. The tutorial will start from a basic implementation of a hardware sensor, writing a driver for the device, using REST API to save the data to the elasticsearch database. An more advanced driver and REST client will be developed using thread pools to tackle network IO

Index Terms—Internet of Things, Industry 4.0, Wireless Sensor Networks, Micro-services, Middleware, Signal Processing, Data Analysis

I. INTRODUCTION

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August 26, 2019

A. Subsection Heading Here

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II. CONCLUSION

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APPENDIX A

PROOF OF THE FIRST ZONKLAR EQUATION

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APPENDIX B

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The authors would like to thank...

REFERENCES

- [1] H. Kopka and P. W. Daly, *A Guide to L^AT_EX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.

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