Predicting Readmission of Diabetic patients

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We are trying to predict whether a diabetic patient will be readmitted to the hospital, using several features representing patient and hospital outcomes. We will use Hadoop/Spark distributed architecture on multiple clouds as the core infrastructure and machine learning classification algorithms for data analysis.

Keywords: Hadoop, Spark, Ansible, Python

https://github.com/cloudmesh/classes/blob/master/project/S17-IR-P004/report/report.pdf

CONTENTS

1. INTRODUCTION

We will use Hadoop to split the dataset and transfer the data chunks to different data nodes. We will use Ansible to install pre-requisite softwares and push configurations on different machines. The data chunks would then be analyzed using machine learning techniques and the results would be aggregated predicting whether a patient would be readmitted or not. This information would help hospitals to be better prepared for readmitting patients.

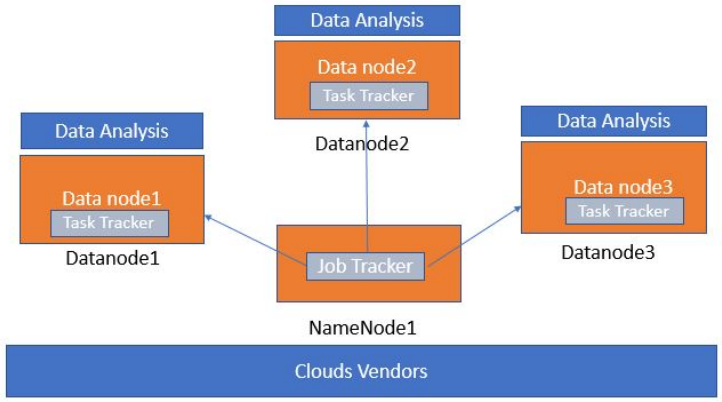

Fig. 1. Deployment Architecture

2. TIMELINE

Week	Target
1	Finalizing Technologies, Data Cleansing
2	Hadoop/Spark Deployment on Chameleon Cloud
3	Troubleshooting
4	Data Analysis
5	Deployment on other cloud using Ansible
6	Benchmarking
7	Report Preparation

3. TECHNOLOGIES

Technology	*Usage*
Hadoop[1]/**Spark** [2]	Distributed Data Storage
Python[3]/**Java**[4]/**Scala**[5]	Development
Ansible [6]	Application Deployment & Configuration Management
TBD	Benchmarking
LaTex [7]	Document Preparation

4. DEPLOYMENT

We will deploy a master & multiple slave nodes in the Hadoop/Spark distributed cluster environment.

We will use **Ansible** as an automated application and configuration deployment tool. This will enable us to install softwares and push configurations simultaneously from master node to the respective target nodes.

5. BENCHMARKING

We will assess the performance of the Hadoop/Spark clusters deployed on different clouds. The parameters for benchmarking would be memory usage, storage size and IO throughput.

6. RESULTS

Results of data analysis and benchmarking will be showcased in this section.

7. CONCLUSION

Using the 130-US hospitals dataset [8] for years 1999-2008, we should be able to analyze factors pertaining to readmission of patients with diabetes.

8. ACKNOWLEDGMENTS

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REFERENCES

[1] "Welcome to Apache™ Hadoop®!" Web Page, accessed: 2017-03-12. [Online]. Available: http://hadoop.apache.org/

[2] "Apache Spark: Lightning-fast cluster computing," Web Page, accessed: 2017-03-12. [Online]. Available: http://spark.apache.org/

[3] "python," Web Page, accessed: 2017-03-12. [Online]. Available: https://www.python.org/

[4] "java," Web Page, accessed: 2017-03-12. [Online]. Available: https://www.java.com/en/

[5] "Scala," Web Page, accessed: 2017-03-12. [Online]. Available: https://www.scala-lang.org/

[6] "ANSIBLE," Web Page, accessed: 2017-03-12. [Online]. Available: https://www.ansible.com/

[7] "The LATEX Project," Web Page, accessed: 2017-03-12. [Online]. Available: https://www.latex-project.org/

[8] "Diabetes 130-US hospitals for years 1999-2008 Data Set," Web Page, accessed: 2017-03-12. [Online]. Available: https://archive.ics.uci.edu/ml/datasets/Diabetes+130-US+hospitals+for+years+1999-2008#