Evaluation of a Cloud Service Provider for Distributed Data Intensive Applications

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Agenda

- Introduction.
- Motivation.
- Research Goals.
- Related Concepts.
- Results.
- Conclusions.
- Future Works.

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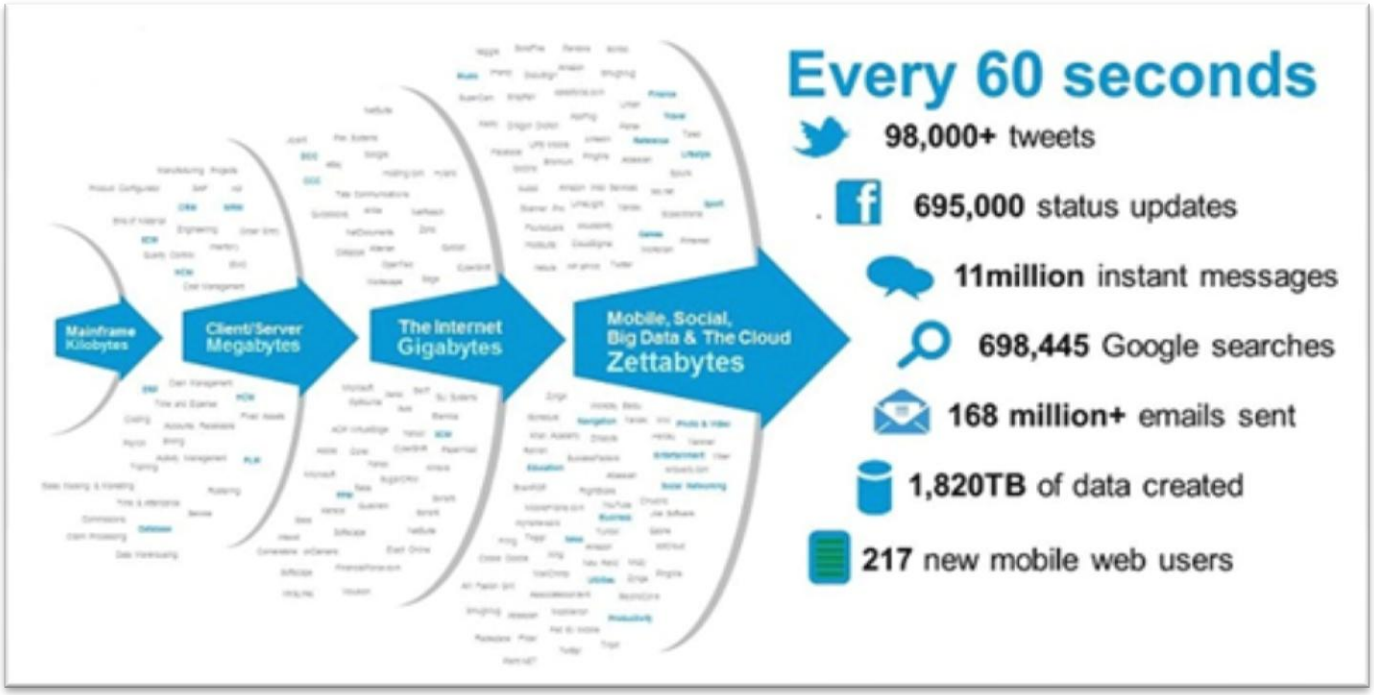
Introduction



Challenges of real world. “Hp (2015)”.

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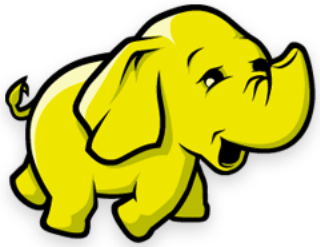
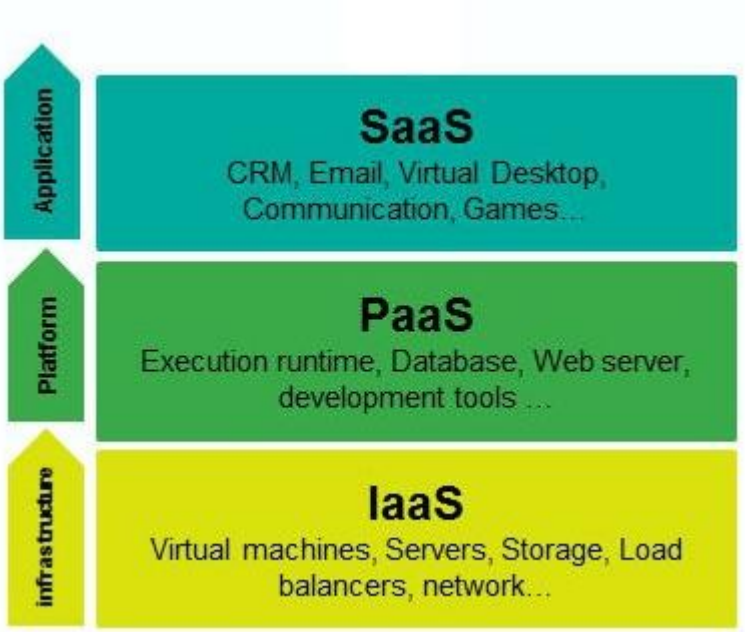
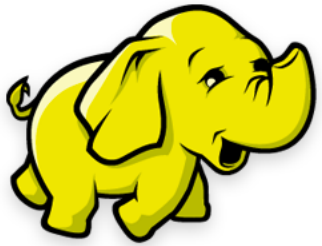
Batch Vs. Streaming



Motivation





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Research Goal

Evaluating Hadoop behavior running on different types of cloud computing services

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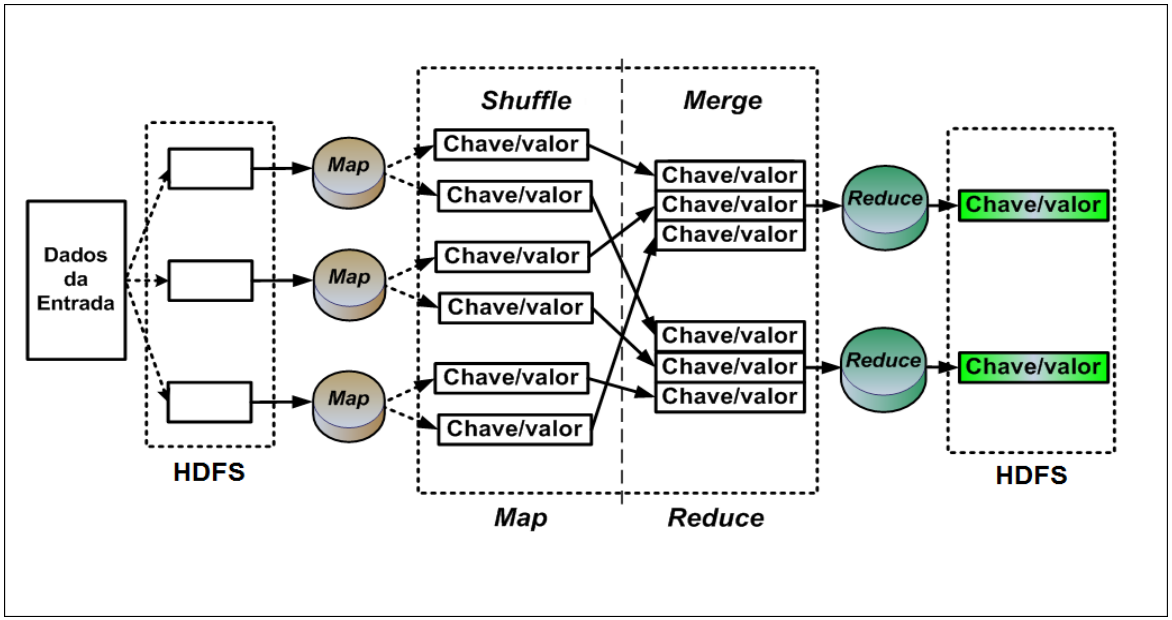
Related Concepts



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hadoop MapReduce

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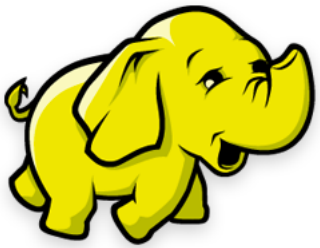
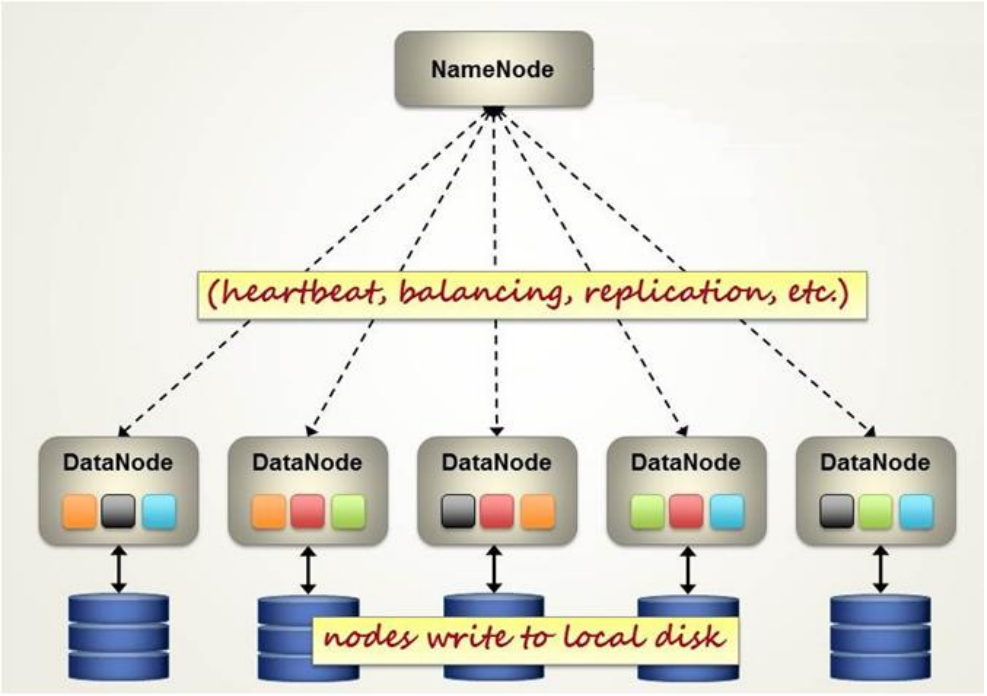
Related Concepts





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hadoop
HDFS

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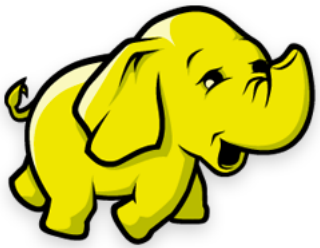
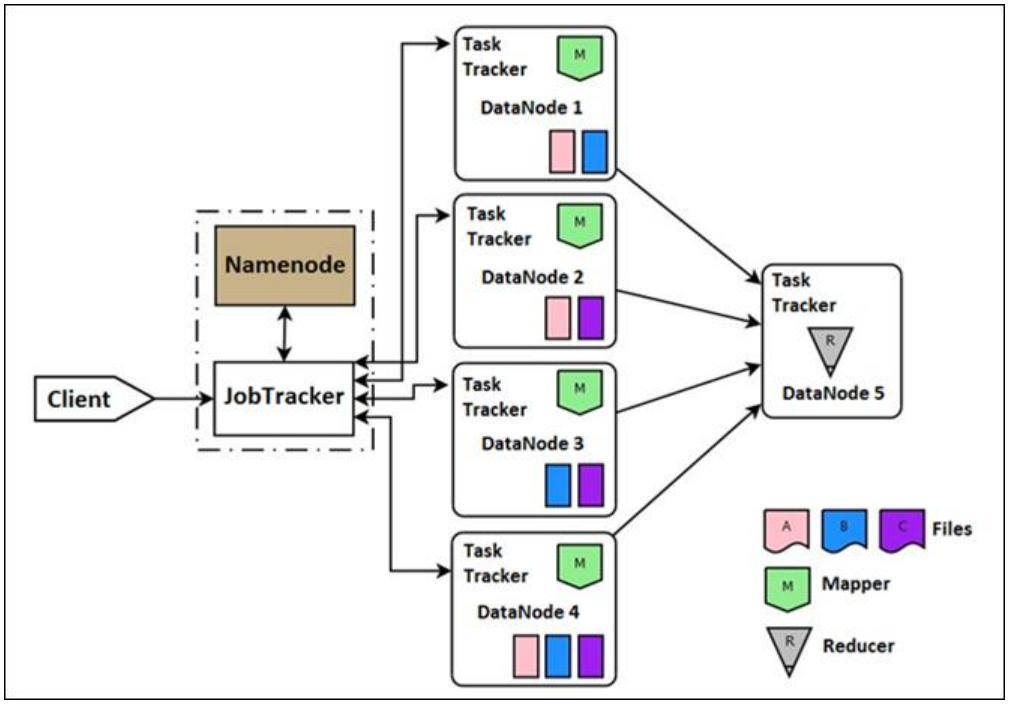
Related Concepts





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YAHOO!

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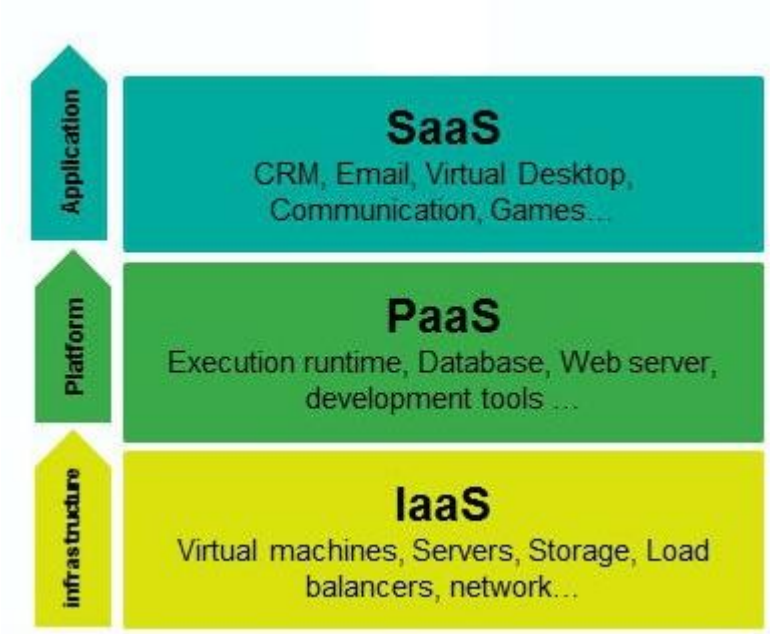
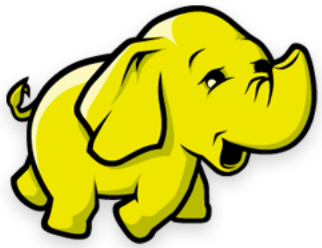
Microsoft Azure

Azure

HDINSIGHT





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Results

- IaaS Cluster:
  - 1/2/3/4 Nodes.
  - D3 Type of node (4 Xeon E5-2660 | 14GB | 200GB).
  - Hadoop 1.2.1 .
  - Java 7.
  - Ubuntu 15.04 LTS.
  - Cost of 1 node: U$$0.376/h.

- PaaS Cluster:
  - 1/2/3/4 Nodes.
  - D3 Type of node (4 Xeon E5-2660 | 14GB | 200GB).
  - HD Insights 2.2 (Hadoop 2.6).
  - Java 7.
  - Ubuntu 12.04 LTS.
  - Cost of 1 node: U$$0.684/h.

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Results

- Benchmarks:
  - WordCount:
    - 1.28GB.
    - Generated by Linux random of 1M of numbers.
    - Need to read and write data on HDFS.
  - Pi:
    - 50 Maps generating data.
    - Need only to use the CPU.
- Metrics evaluated:
  - Time of execution.
  - SpeedUp.
  - Relation of cost and time of execution.

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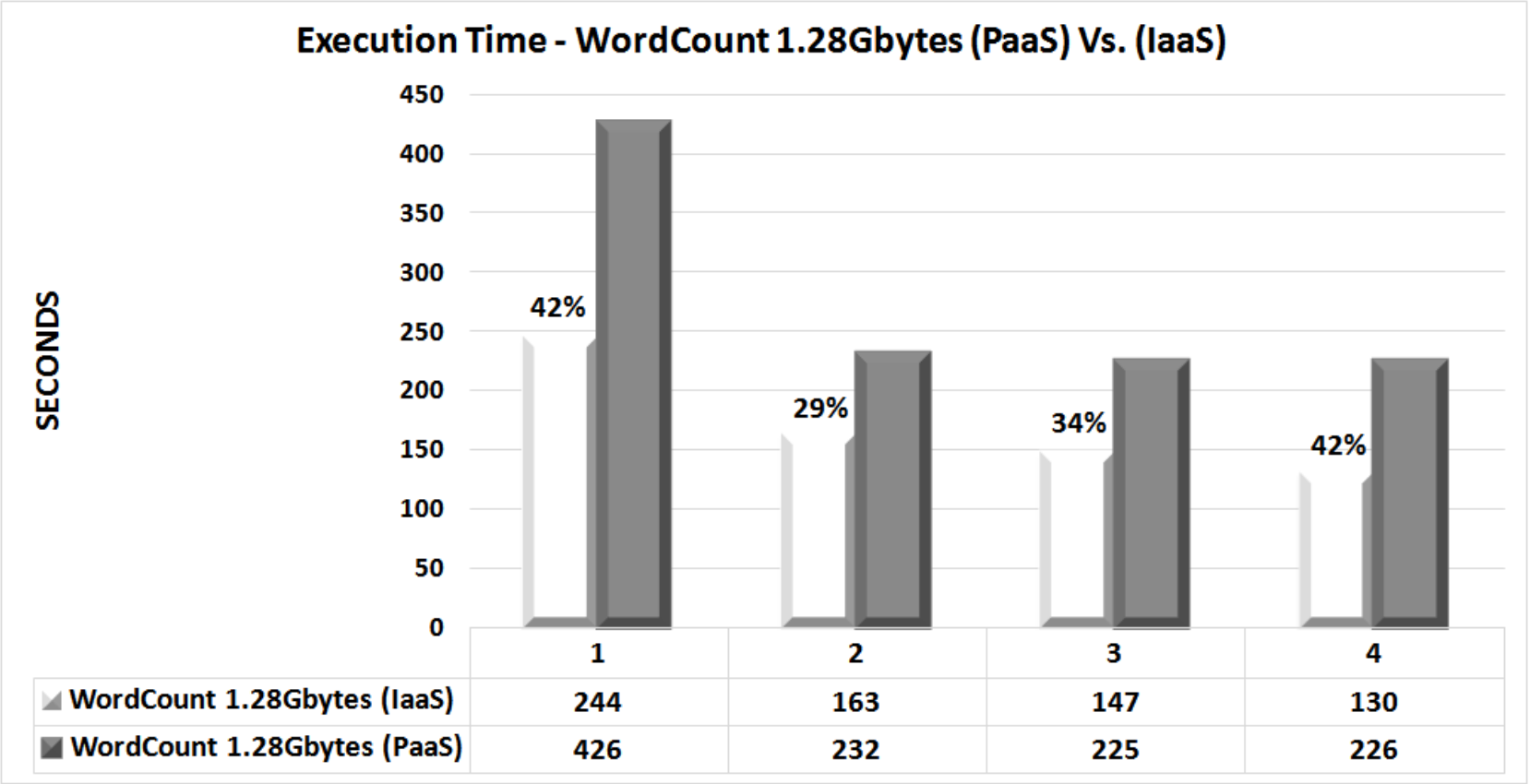
Results



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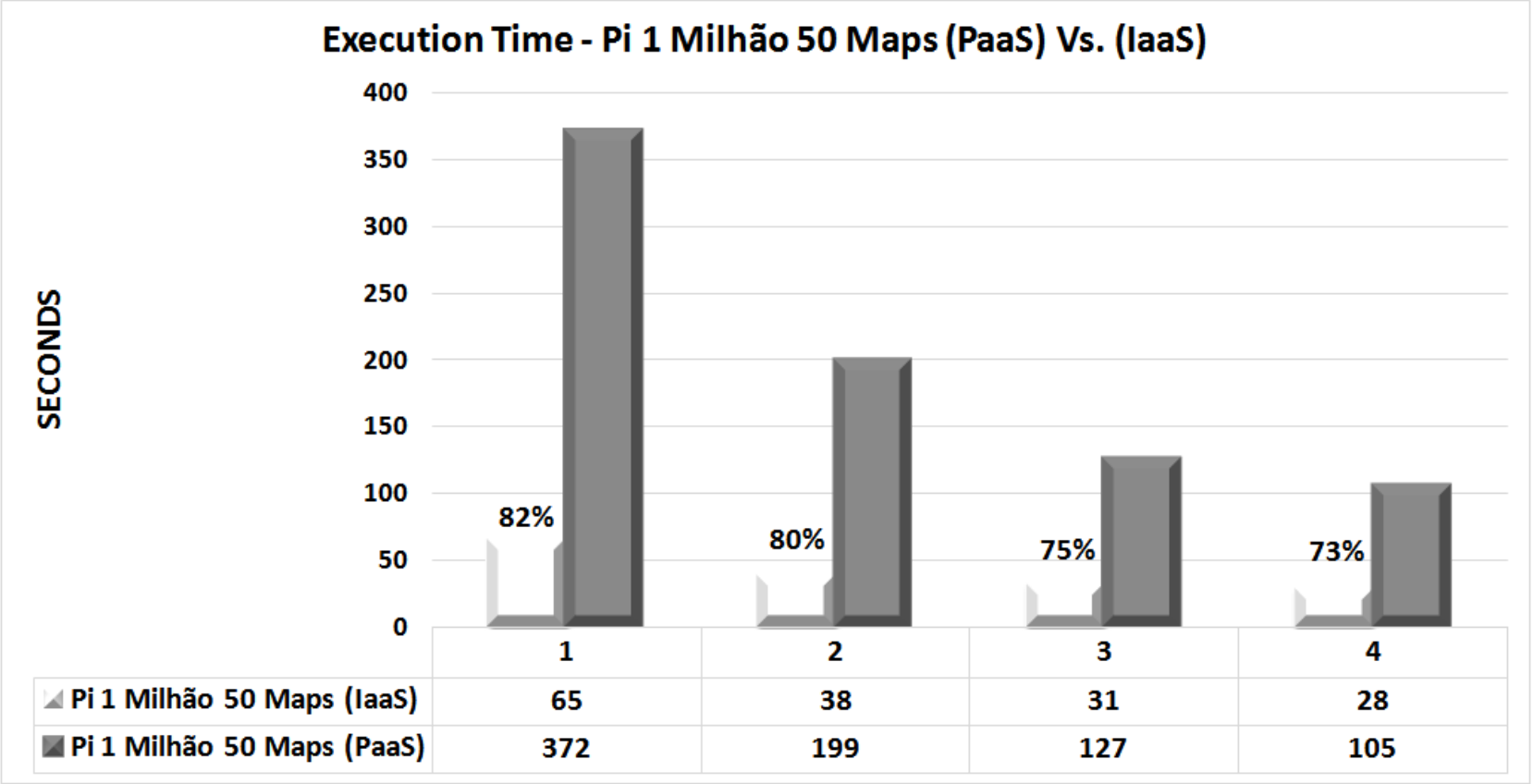
Results



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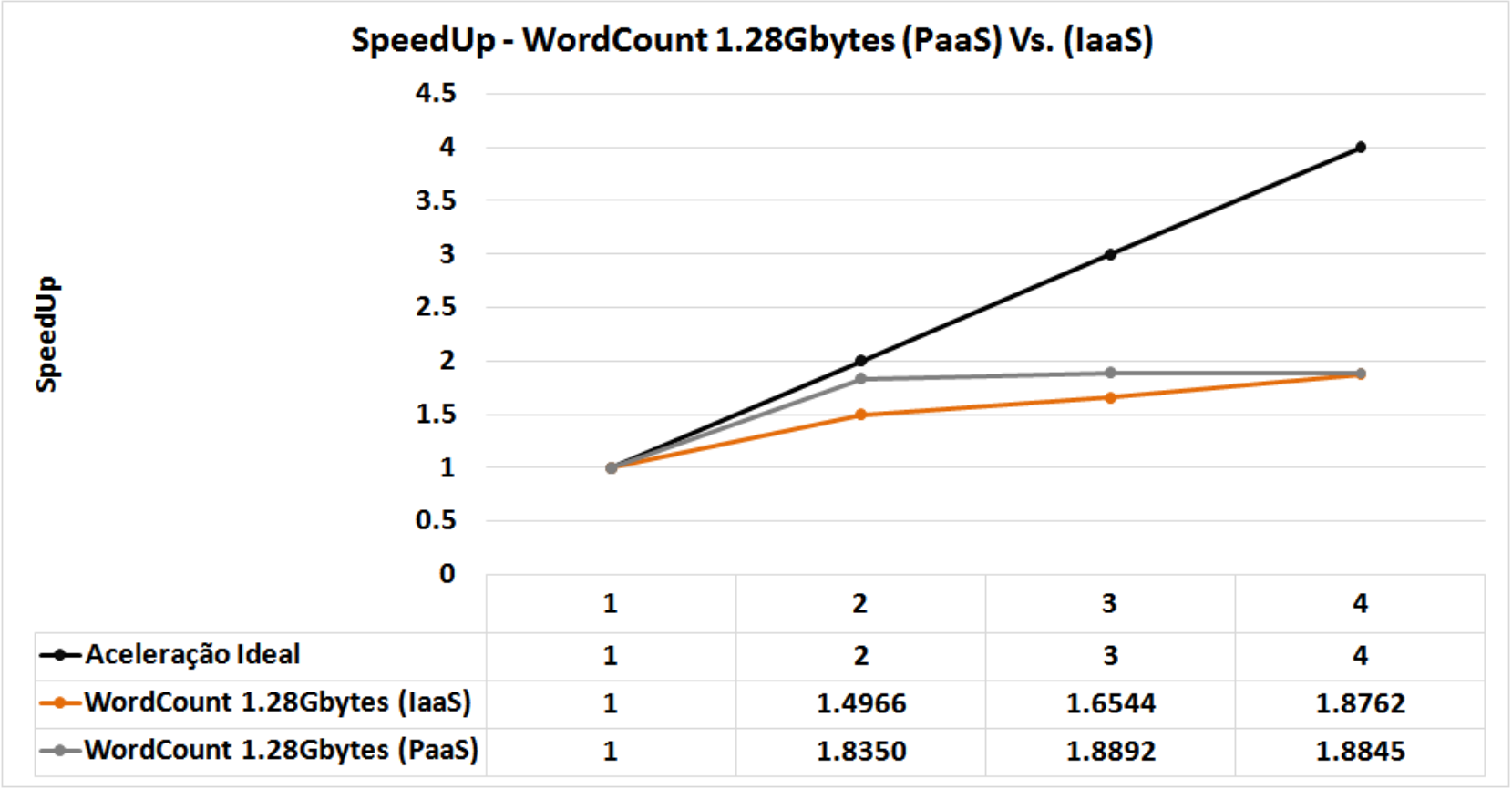
Results



	1	2	3	4
Aceleração Ideal	1	2	3	4
WordCount 1.28Gbytes (IaaS)	1	1.4966	1.6544	1.8762
WordCount 1.28Gbytes (PaaS)	1	1.8350	1.8892	1.8845

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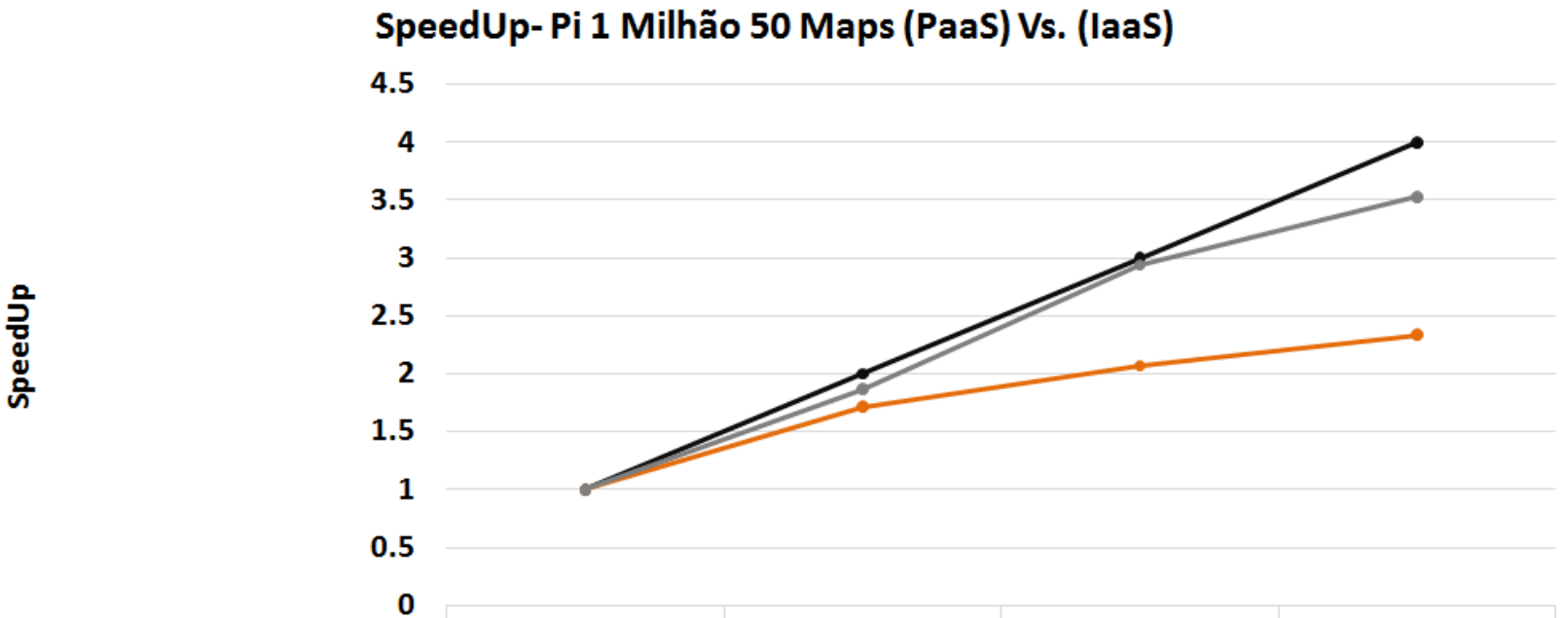
Results



	1	2	3	4
Aceleração Ideal	1	2	3	4
Pi 1 Milhão 50 Maps (IaaS)	1	1.71513	2.07014	2.33451
Pi 1 Milhão 50 Maps (PaaS)	1	1.86533	2.93987	3.52905

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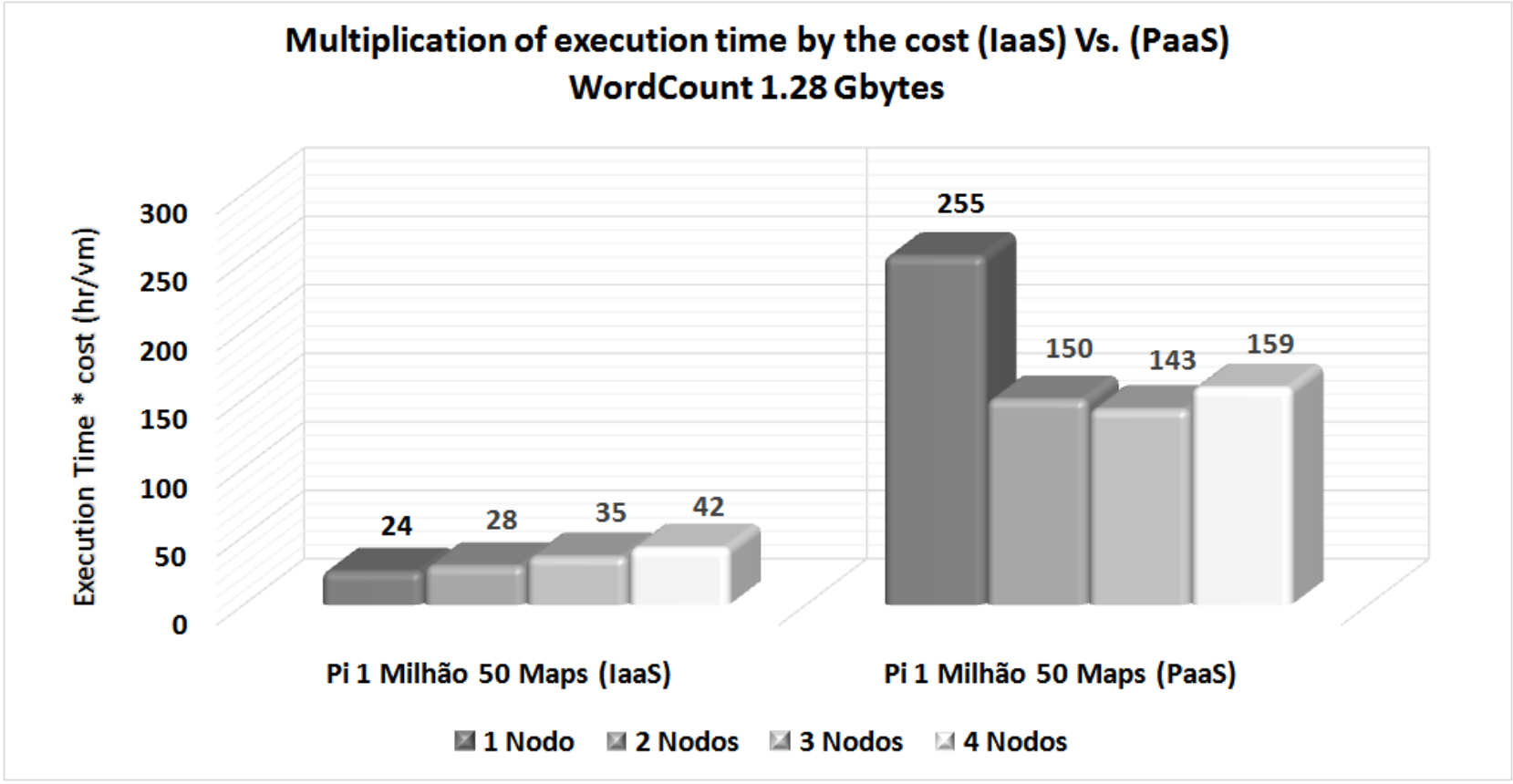
Results



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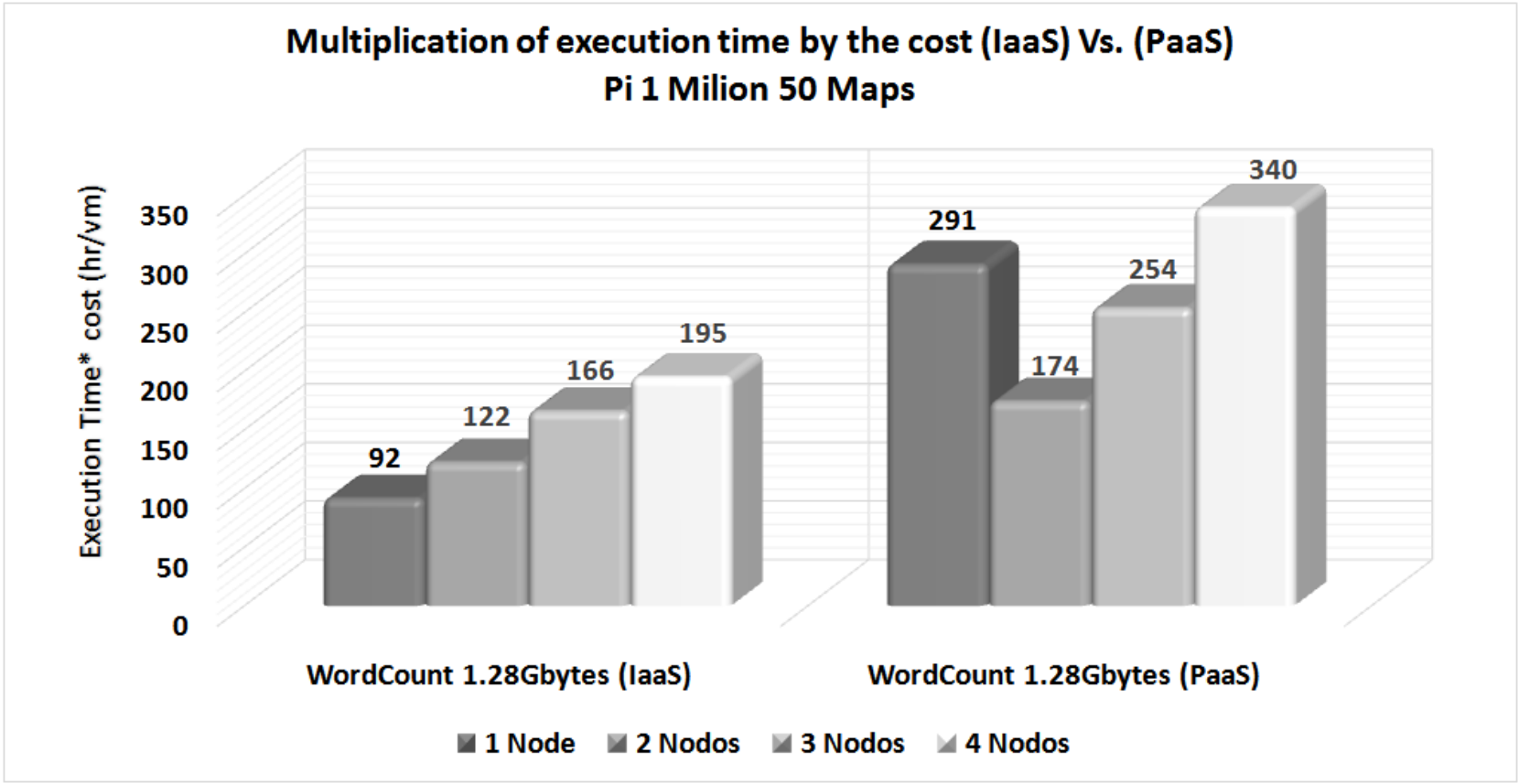
Results



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Conclusions

- IaaS present the best performance.
- PaaS present the best acceleration.
- In PaaS the service provider will make an effort to provide physical resources with high accuracy and low variability.
- This effort needs to be paid by the user. It reduces the efficiency of service PaaS.
- Use of Azure blob can be the reason of worse performance in PaaS service.

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Future Works

- Use of Hadoop Yarn (2.x) in IaaS.
- Use of disk servisse Azure blobs in IaaS.
  - Compared to the use of local cache (SSD).
- Use of another types of VMs:
  - Type D (Data Intensive).
  - Type A (General Purposes).

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Questions ?

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