Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES
FIRST SEMESTER MASTER OF ENGINEERING - ME (Big Data and Data Analytics)
DEGREE EXAMINATION - NOVEMBER 2017
DATE : Tuesday, November 21, 2017
TIME : 10:00AM - 1:00PM

DevOps for Big Data Systems [BDA 615.1]

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1) Differentiate the nature of big data generated by applications for healthcare, government, and scientific domains, employing three characterizing features - volume, velocity, and variety. (10)

2) Bring out at least four important technical differences between traditional SQL DBMS and a document oriented NoSQL data store. (10)

3) With the help of a block diagram, analyze the architecture of GFS, focusing especially on the following architectural elements: (10)
   a) The Master and its Metadata
   b) Chunks and Chunk Servers

4) Discuss how GFS achieves scalability and fault-tolerance by making clients perform data transfer operations directly with the chunk servers. Show a block diagram to highlight your arguments. (10)

5) Provide the formal definition and an example for each of the following operators found in the algebra of Grammar of Graphics: (10)
   a) Cross operator
   b) Blend operator

6) Show with a good example, how the Nest algebraic operator may be used to represent a Nested dot plot. (10)

7) Show the contexts in which you would choose the following visualization techniques: (10)
   a. Arc diagrams
   b. Horizon graphs

c. Stacked graphs

Give an example for each to justify your response. (4+3+3)

8) With suitable examples, state at least two techniques for visualizing hierarchies of data. What are the technical challenges in each of these techniques? (10)

9) With an example for each, state the rationale behind the following rules for producing better visualization: (10)

A) Avoid Chartjunk

B) Know your audience

C) Adapt figure to the support medium (4+3+3)

10) State and analyze four important features of the Graph Processing (programming) model. (10)

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