

Final Assessment Test (FAT) - APRIL/MAY 2023

Programme	B.Tech	Semester	Winter Semester 2022-23
Course Title	VIRTUALIZATION	Course Code	CSE4011
Faculty Name	Prof. Gayathri R	Slot	E2+TE2
		Class Nbr	CH2022235000608
Time	3 Hours	Max. Marks	100

Section1 (2 X 15 Marks)
Answer All questions

01. Kishore and his team started the process of unravelling the monolithic Bleacher report application into a services based application. They immediately started seeing the impact of having teams empowered to operate services independently but simultaneously noticed the negative impact of a growing operations burden. The dream at B-Report was to enable developers to build small light-weight service applications quickly and to run distributed applications independently. Propose a suitable architecture for B-Report with a neat sketch and explanation. Justify. [15]
02. In large data centers, where hundreds or thousands of servers are housed, virtualization provides a way to decommission a large portion of servers. Depict the underlying architecture where it could help to run automated procedures to take care of VM utilization monitoring and related system requirements in order to reduce overall footprint of a data center, reduced power and cooling requirements. Elaborate the steps to narrate how such automation procedure could be carried out in reducing hardware maintenance costs and administrator routine tasks. [15]

Section2 (7 X 10 Marks)
Answer All questions

03. XYZ is a large data center decided to get few more VM's from the Cloud Service Provider (CSP) due to their random surge in customer requests. XYZ prefer this solution as they know the surge in customer traffic is only for short term. CSP provided the software to be installed in customer systems which provides them interface to access CSP's remote servers. The new VMs are capable of handling more number of customer's and the performance is high when compared with the machines in data center. As a technical expert of XYZ, you are supposed to explore all the underlying technical implementation details of hypervisor and the virtualization category adopted by the new VMs as any deviation or conflict may lead to severe business loss. Produce detailed report of your findings related to aforementioned cases to higher authorities along with associated challenges and performance issues. [10]
04. Fulcrum Technologies is a fast-growing company providing software-as-a-service (SaaS) that helps telecom companies — including mobile phone companies — manage their widespread, multisite inventories of equipment, parts and site infrastructure. Fulcrum Technologies is a company managing close to 100 servers with one-off manual configuration scripts. Fulcrum's infrastructure was split about evenly between the development environment and the production environment, which hosts Fulcrum's software delivered as a service. The SaaS environment was growing quickly, as for each new customer, Fulcrum needs to spin up at least two new instances [10]

of the application. The major challenge is to overcome the manual configuration for the above said application. What are your guiding principles to automate the above scenario? Discuss your approach in detail.

05. Mr. Sam is assigned with the task of developing a child safety application. The purpose is to achieve complete monitoring of child below three years who are left in play group or day care. The constraints for application development are: monitoring child movement using Global Positioning System (GPS), identification of nearby obstacles or pits and sending alert to care taker. The application need to track movement of multiple child's by tracking different geographic locations and update the same in cloud platform. Since the scenario involves merely large volume of data processing, the system demands combined storage space of three physical machines. [10]
- i) Identify the technology which may help to access the child's data from care takers of different geographic locations with neat sketch. (3 Marks)
 - ii) After predicting all the information related to child's safety, if the primary/ master system is crashed, what would be the alternates to ensure the smooth running of an application without any interruption? (3 Marks)
 - iii) While doing the switch over to new system to recover the crash of master machine in the above scenario, is it affordable if the process incurs more delays? Justify your response. (4 Marks)
06. To rectify the physical machine configuration issues in DLT organization, they have decided to create data cluster among the existing machines. But they are not successful in their task as they ended up with the issues: unbalanced clusters, failure in vMotion and difficulty in accessing the cluster machines. Help DLT organization by figuring out the cause for each issue and provide solutions to support the effective functioning of it. [10]
07. How important it is to yield optimized resource utilization when multiple virtual machines are placed on same physical server in a various geographical locations of a cloud environment? [10]
- i) Justify your response with neat sketch by analysing the security of a VM if maintained in different locations is sustainable against DDoS attack. (5 Marks)
 - ii) Identify mandatory security measures to be followed in order to protect the virtual environment in cloud. (5 Marks)
08. Jishan is a technical expert decided to implement a new virtualized recovery environment to enable the features replication, fail over virtualized workloads and copying VM workloads off-site in regular basis. Formulate the architecture appropriate for Jishan to carry out the aforementioned features along with neat sketch with detailed steps to carry out the same. [10]
09. Depict the steps to create a test environment for verifying the features of virtualized components and elaborate the configuration testing process along with table-configuration matrix. [10]

