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CASE STUDY 6-2 The Case of Extreme Scientists

How would you describe the architecture Dr. Schadt uses to do his research?

Dr. Schadt employs cloud computing architecture to efficiently conduct this research to analyze a vast amount of biological data. The architecture that he uses relies heavily upon the cloud infrastructure that is provided by amazon Web Services (AWS). The component of his architecture includes AWS, High performance Computing(HPC) Data Processing and Analysis, Real time Data Analysis, and Remote access through the Web. AWS provides a cloud computing platform offering a range of services that include computing power, storage, and databases. The HPC allows leveraging for the AWS's vast computing capabilities to process and efficiently analyze the massive dataset s. The complex analysis of all the logical data is used by the computing services offered by AWS to enable various processing and analytic tasks through the Data Processing and Analytic power of AWS. The integration of Pacific Biosciences (PacBio) technology allows Dr. Schadt to analyze the data in real time to analyze the individual DNA molecules within the architectural cloud. Also, Dr. Schadt can initiate data analysis anywhere if he is able to get a remote connection via the internet by leveraging the cloud as well.

What is the risks Dr. Schadt faces by using Amazon for his supercomputing? What are the benefits?

There are several risks that Dr. Schadt faces by using Amazon for his supercomputing. One of the risks that he faces is data security and privacy. The risks associated with the security and privacy of the sensitive biological data that is being process is a security risk. This

processing of sensitive data brings into question the concern about data breaches as well as the threat of unauthorized access to the data that is being processed. If there were any breaches in the system, this could be catastrophic to the sensitive data as well as many other things. There is also the risk of the connectivity and reliance to the internet connection. If there happened to be an internet outage or problem, this could disrupt the research process. Any progress that might be made might also lead to catastrophic disruptions in the ability to process or analyze data efficiently which can cause a major disruption. While there are a few risks, there are also some benefits that Dr. Schadt faces using Amazon for his supercomputing. This is a cost-effective option that Dr.Schadt employs by facilitating the use of Amazon. Compared to investing in and maintaining a tradition supercomputer, the cost far outweighs the cons by not hosting it himself. Combined with the high-performance computing capabilities offered, the cost equates to only a fraction of the cost of computing and processing the data himself. Also, the scalability and flexibility of the architecture is another benefit. The cloud can provide him with a highly scalable service. This enables Dr. Schadt to easily scale up or down based on his computation needs, allowing greater flexibility when overseeing his research. Another benefit that Dr. Schadt gains from this is accessibility. With Dr. Schadt being able to remotely connect anywhere in the world to process and analyze the data, the ability to monitor and analyze data becomes extremely more flexible for him. The remote connection that he can establish allows him to manage and effectively conduct ongoing research with more ease allowing him to utilize his time both effectively and efficiently.

If you were advising a company trying to decide about using cloud computing for key business applications, what would you advise and why?

If I were to advise a company trying to decide about using cloud computing for key business applications, there are several key factors that I would recommend. I would first suggest an assessment of the security measures that would be applicable. By evaluation of the cloud providers security protocols, compliance certifications and encryption standard present in the architecture, this would help to ensure the security of the data in question to prevent unwanted problems from arising. I would also suggest evaluating the Performance Analytics and the reliability of the application to ensure that the application would be reliable. By examining the providers track record regarding items such as up-time, scalability, performance, and application availability, this would allow to decide on whether the service would be available when needed and if the connections and service would be reliable. You would not want to get an application that constantly goes down when you need it up whenever you need to access it. This allows for the company or organization to be able to depend on the software or application that they are using without having to worry about something going wrong and put their activities at risk. Another key feature to keep in mind would also be the integration and the migration of data. By developing a robust strategy for existing data migration, the integration into the new application needs to be on par and able to migrate all the data efficiently without hiccups. If the migration of the existing data that an organization or company has is not easily able to be migrated, then this might pose a problem that could be overseen differently, by themselves or with another provider. Another particularly important key feature of the choice would be disaster recovery and backups. The providers' services must be analyzed in depth on the handling of disasters and the data. The analysis of these handlers must be evaluated to ensure that data is not lost in these circumstances and mitigate risks is things such as servers going down or any other detrimental situation occurring. Careful consideration must me made for the overall security, compliance,

cost, and data management when adopting a provider's application to manage data. These are essential key aspects of any adoption of a cloud computing architecture into business applications A company should thoroughly evaluate the decision and weigh all the pros and cons of each provider to optimally choose which option would be best for them.

Work Cited

Pearlson, K.E, Saunders, C.S, & Galletta D.F. (2020). *Managing & Using Information Systems: A Strategic Approach, 7th Edition*. Hoboken, NY: Wiley.