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| **Assignment 1**   1. *Explain in detail about cloud infrastructure*   Cloud infrastructure is a term used to describe the components needed to for cloud computing. It includes the hardware, abstracted resources, storage, and network resources.  The cloud is used for a variety of tasks. One of them is hosting a website. A lot of things have to be considered when a website is hosted. There are public (ipv6) and private (ipv4) ip addresses for servers, database, hosting platform and few more tools are required. Setting up all the tools locally takes up a lot of time and has its own set of challenges especially the maintenance aspect of it after putting in a lot of efforts of setting everything up in the first place. Cloud makes things easier in these respects. They have multiple services that can be used or not used based on our requirement.  Factors to consider for building cloud infrastructure:   * Governance   Questions like are the resources being used in the best possible way and whether/how much value are they providing to the organization addressed here. This also takes best practices and templates into consideration.   * Organization   Questions like what roles to assign people as per the tasks required, whether or not to give access to certain resources and to what extent addressed here.   * Finance   Managing budgets as per requirement and the capability of the organization.   * Tools   Example of key tools include: Virtualization software, orchestration software, security software, business continuity software and self-service portal software.   * Service-level agreement and service contract   Contract negotiated between the service provider and the consumer that specifies various parameters and metrics such as cost, service availability, maintenance issues, performance levels, service desk response time and consumers’ and providers’ responsibilities.   * Avoid vendor check-in   Situations where the consumer is unable to move readily from the current provider to another.   * Software licensing concerns   Consumers considering whether their current software license is cloud enabled or not.   * Service model considerations   Addressing the question of whether everything will work well or not. Are the software thoroughly tested? Will the platform/infrastructure be compatible with the consumer’s existing set up of hardware (OS and other configurations)?   * Migration   Considering factors such as network bandwidth, data security, data integrity, data consistency, data jurisdiction and so on.   * Testing   Provider helping consumer with testing everything once the migration process is over.   1. *Explain cloud computing reference layer and its layers*   The cloud computing reference model is an abstract model that characterizes and standardizes the functions of a cloud computing environment by partitioning it into abstraction layers and cross-layer functions.  This reference model groups the cloud computing functions and activities into five logical layers and three cross-layer functions.  The five layers are physical layer, virtual layer, control layer, service orchaestration layer, and service layer.  Each of these layers specifies various types of entities that may exist in a cloud computing environment such as compute systems, network devices, storage devices, virtualization software, security mechanisms, control software, orchestration software, management software and so on.  It also describes the relationships among entities. The three cross-layer functions are business continuity, security, and service management. Business continuity and security functions specify various activities, tasks, and processes that are required to offer reliable and secure cloud services to the consumers.  Service management function speicifies various activities, tasks, and processes that enable the administrations of the cloud infrastructure and services to meet the providers business requirements and consumer’s expectations.    *Source:* [*LinkedIn*](https://www.linkedin.com/pulse/cloud-computing-guidebook-part-3-reference-model-nabil-kassi/)   1. *What are the deployment options and types of cloud computing?*   **Cloud Deployment Options are**:   * Public   Services are provided on a public cloud for use based on shared cost model for all users or a licensing policy. Perfect for organizations with fluctuating demands.   * Private   Cloud infrastructure for stand-alone organizations. Offers great control over security. Best for organizations with high security requirements, high management demands, and availability requirements.   * Hubrid   Incorporates best of both public and private clouds and can remain separate entities. Ideal for scalability, flexibility, and security.     * Community   Mutually shared by organizations that belong to a particular community such as banks, government organizations, or commercial enterprises. They generally share similar issues of privacy, performance, and security. This type of deployment model of cloud computing is managed and hosted internally or by a third-party vendor.  **Types of Cloud Computing are:**   * Infrastructure as a service   Virtual provisioning of computing resources over the cloud. An IaaS provider can give a range of computing infrastructures such as storage, servers, networking hardware alongside networking and support.     * Platform as a service   Created for a programmer to develop, run, test and manage applications.   * Software as a service   Also known as on-demand software that hosts applications where users can access them with the help of a browser and internet connection. |