

# Sessional Assignment Summer 2020

Course Title: Cloud Computing

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## **Q1. What is VPN in Cloud Computing and what does it contain?**

**Answer.**

### **VPN in Cloud Computing:**

Cloud VPN is a type of VPN that utilizes a cloud-based network infrastructure to deliver VPN services. It provides globally accessible VPN access to end users and subscribers through a cloud platform over public Internet.

Cloud VPN is also known as hosted VPN or virtual private network as a service.

Cloud VPNs provide security and compliance to networks that have transitioned to the public cloud.

- **Secures the Cloud:**

While the cloud provider offers the network infrastructure, it does not address access point security into the network. In this 'shared responsibility model', it is up to the consumer to secure access on top of the cloud environment.

- **Enables Remote Access:**

Employees connect from multiple devices, from various locations during all hours of the night and day. A Cloud VPN allows employees to securely access the organization's private network through public networks and even share data remotely.

- **Encrypts Transmitted Data:**

The combination of data encryption and tunneling protocols means that all transmitted data, regardless of device or location, is completely encrypted. This level of security ensures that only authorized connections are established.

## **Q2. What is the correlation between business size and data center scale?**

### **Answer.**

- **More Data Storage**

The amount of data being generated is increasing every year at a staggering pace, prompting many people to wonder where all that information can possibly be stored. As more and more companies begin utilizing internet of things (IoT) devices and edge computing strategies, data collection will present them with significant challenges. Since most of the data gathered by IoT devices and customer-facing applications is unstructured, organizations may not be able to separate business-critical insights from irrelevant noise. Even if they do have the ability to sort through that data using powerful analytics (more on that in a moment), some data will need to be stored for later use or analysis. Legal obligations may also require them to hold information for a set period of time before it can be deleted, forcing the company to maintain sufficient storage capacity as a pure expense.

- **Increased Compute Resources**

Of course, data storage is only one piece of a company's IT infrastructure puzzle. As mentioned earlier, much of the data companies gather is unstructured and difficult to read or analyze. Consider all the information taken in by a social media application or a mobile device. There are certainly a lot of potential insights to be found in that data, but finding them means analyzing terabytes (or more!) of raw information to identify relevant patterns and tendencies. Sophisticated algorithms and machine learning software can draw valuable insights from this data, but they require a lot of computing resources to do it.

- **Better Connectivity Options**

Carrier-neutral colocation data centers offer a wide range of connectivity options, allowing organizations to custom build their infrastructure needs from the ground up and rearrange them on the fly. With multiple ISP carriers to choose from, companies can select (or change) partners based on their current and future bandwidth needs, or choose to use a blend of providers for better reliability and security. They can also select from a range of public cloud providers or elect to structure their own hybrid or multi-cloud architecture all within the data center environment.

- **Enhanced Security**

Many small businesses don't think about how scaling operations will affect the way they approach data security. As they take on new customers and offer new services, however, the data and applications that are critical to their business become increasingly valuable. Protecting those assets is crucial to sustained success, but implementing thorough security measures such as video monitoring, on-site security personnel, and biometric authentication may be prohibitively expensive. By collocating key assets with a data center, a small business can gain peace of mind thanks to the facility's state of the art physical security and logical access protocols.

- **Improved Compliance**

As companies expand their business to offer more services to more customers, they can quickly find themselves running into regulatory challenges they never considered when they started out. Perhaps personal data isn't being properly managed to ensure confidentiality or financial data lacks appropriate security encryptions. Meeting the strict standards of regulatory compliance can present serious challenges to small businesses that can't afford to bounce back from a potential government fine or customer lawsuit in the wake of a data breach.

### **Q3. What are racks in data center? How racks are selected and placed?**

#### **Answer.**

A data center rack is a type of physical steel and electronic framework that is designed to house servers, networking devices, cables and other data center computing equipment. This physical structure provides equipment placement and orchestration within a data center facility.

- **Ventilation**

Overheating in a data center can damage your servers beyond repair. And the biggest contributor to reduce overheating in your data center is ventilation. In order to improve airflow in your data center, you could choose server racks with a mesh front door and a perforated rear door. You could also consider buying server racks with removable doors, which can allow for quick and easy release of hot air in emergency situations. If sophisticated ventilation solutions are not within the scope of your budget, you could also place a fan above the servers to keep them relatively cool.

If ventilation is your main requirement, you could go for an open server rack which just comes with mounting rails to support your server. However, if you want your servers to be protected by enclosures, you could go for top-cooled racks with precision and dedicated cooling units for individual servers.

- **Enforcements**

Choosing to keep your racks enclosed or open, each comes with its own advantages and disadvantages. For example, an open rack dissipates maximum heat into the surroundings but a closed rack provides your servers with moisture-, dust- and chemical-protection. A closed rack is also more aesthetic compared to open racks.

If security is your first priority, you could go for the standard 42U server cabinets which comes with lockable glass doors.

- **Assembly**

The proper assembly of your rack, along with the strength of material with which it is built with, determines its load capacity. Therefore, it would be unwise to consider rack assembly as a trivial task. We would suggest hiring trained professionals to do the assembly for you, to avoid any errors in the assembly which could cause structural failures and even damage to your servers.

The easiest server racks to assemble are open server racks where the mounting rails are to be attached to each other. However, ease of assembly should ideally never dictate your server rack decisions. Prioritize ventilation, security and adjustability over assembly and let the professionals do the work for you.

- **Adjustability**

It is important that your rack system should allow for flexibility, adjustability, and easy accessibility, all of which should be an important part of your data center design plan. Inspect the type of servers and cables which will go into the making of your data center and optimize the racks and other elements of your data center in such a way that connectivity and accessibility are never compromised on.

27U enclosed server racks come with adjustable server mounts - since it is of considerable size, it can also fit most of the popular servers from top companies.

- **Customizability**

Most times, buying server racks off-the-shelf might not give you the flexibility that you are looking for. This is where server rack customization can help you.