Spend at least 10 hours exploring the following:

**1: What are key drivers for moving to cloud?**

* **Cost Savings with Cloud Storage**

When you move to cloud-based computing, you are utilizing the infrastructure of the cloud provider rather than your own infrastructure. This means that the cost of maintenance, updating equipment, and managing software on the devices becomes the responsibility of the service provider.

## ****Cloud Storage Provides Convenience****

## Businesses are increasingly becoming more mobile as technology enables them to do so. Of course, employees still have to be able to access and share files when they are working outside of the office. With cloud-based storage, users can easily access the files they need wherever they are located. This enables your employees to focus on the tasks that can actually drive growth in your business like meeting face-to-face with clients or prospecting for new business.

## ****Flexibility and Scalability****

## As your business grows, you need your computing services to grow with it. If you are managing your own equipment, this means increased cost as you install new infrastructure and more costs to maintain that equipment. With cloud-based computing, you can simply purchase more storage or computing power to meet your needs and, best of all, have instant access to that expanded capability.

## ****Cutting-Edge Security****

## It’s hard not to turn on the daily news and see a story about the latest major data breach. While cloud-based computing isn’t 100 percent secure, your business does get the benefit of regular security updates. Most importantly, the cost and management of the new security doesn’t fall in your lap. Many cloud providers are also implementing artificial intelligence to help identify and track down the latest threats to provide even greater security.

## ****Your Unique Needs and Budget****

With on premise network and storage infrastructure, you don’t have the ability to increase or decrease the power of your infrastructure as needed. Rather, you have to maintain the maximum capabilities needed even during slow times.

With SaaS cloud-based computing, your needs can dictate what you pay for. Increase your capabilities during busy seasons and save money during slow seasons.

## ****Rapid Disaster Recovery****

A fire or flood in your business could be devastating if you store data on premise. Not only do you need to recover data, you may need to replace infrastructure at a very high cost. This can lead to prolonged downtime, increased expenses, and lost revenue.

 With cloud-based computing and cloud-based storage, a disaster in your business doesn’t mean you have to go completely dark. Your data is stored and backed up across several data storage centers. Even a disaster at one storage center can be overcome quickly with redundancy thanks to other storage centers and backups.

## ****Improve Collaboration Among Teams****

## If your business requires multiple teams to collaborate on projects or you have teams in multiple locations, collaboration is vital to the success of your business. With cloud-based storage, teams in different locations can easily share and collaborate on documents seamlessly. There’s no need to install additional network infrastructure to connect your on premise equipment and storage with off-premise teams.

## ****Enable More Efficient Document Storage and Review****

With advanced capture and cloud storage, documents can instantly be analyzed and stored in a way that makes it easy for your business to access and review documents. This can be incredibly handy if you are in the process of going through an audit.

**2: What is Cloud Infrastructure (Regions, Computing Resources, and Storage).**

Cloud infrastructure is the**collection of hardware and software components that enable cloud computing and the delivery of cloud services**

**Regions:**

**The Location for the storage is selected.**

**Computing Resources:**

A virtual Machine is created to facilitate the client while using the remote access.

**Storage:**

The amount of storage selected in the region for our ease of use.

**3: Virtualization in Cloud and how virtualization in cloud works?**

In cloud computing, virtualization facilitates the smooth functioning of cloud computing and the creation of virtual machines. Cloud users can create a virtual ecosystem to run multiple operating systems and storage devices. Secondly the cloud virtualization allows hardware and virtual systems to work together with software tools.

**4: Cloud Security and threats.**

A complete cloud security strategy addresses all three aspects, so no cracks exist within the foundation. You can think of each as a different lens or angle with which to view cloud security. A solid strategy must mitigate risk (security controls), defend against threats (secure coding and deployment), and overcome challenges (implement cultural and technical solutions) for your business to use the cloud to grow securely.

You cannot completely eliminate risk; you can only manage it. Knowing common risks ahead of time will prepare you to deal with them within your environment. What are four cloud security risks?

1. Unmanaged Attack Surface
2. Human Error
3. Misconfiguration
4. Data Breach

**5: Types of Storage on cloud.**

There are three main cloud storage types: object storage, file storage, and block storage. Each offers its own advantages and has its own use cases.

### **Object storage**

Organizations have to store a massive and growing amount of unstructured data, such as photos, videos, machine learning (ML), sensor data, audio files, and other types of web content, and finding scalable, efficient, and affordable ways to store them can be a challenge. Object storage is a data storage architecture for large stores of unstructured data. Objects store data in the format it arrives in and makes it possible to customize metadata in ways that make the data easier to access and analyze. Instead of being organized in files or folder hierarchies, objects are kept in secure buckets that deliver virtually unlimited scalability. It is also less costly to store large data volumes.

### File storage

File-based storage or file storage is widely used among applications and stores data in a hierarchical folder and file format. This type of storage is often known as a network-attached storage (NAS) server with common file level protocols of Server Message Block (SMB) used in Windows instances and Network File System (NFS) found in Linux.

### Block storage

Enterprise applications like databases or enterprise resource planning (ERP) systems often require dedicated, low-latency storage for each host. This is analogous to direct-attached storage (DAS) or a storage area network (SAN). In this case, you can use a cloud storage service that stores data in the form of blocks. Each block has its own unique identifier for quick storage and retrieval.

**6: What is multi-cloud, hybrid multi-cloud, and serverless?**

**Multicloud** is when an organization uses cloud computing services from at least two cloud providers to run their applications. Instead of using a single-cloud stack, multicloud environments typically include a combination of two or more [public clouds](https://cloud.google.com/learn/what-is-public-cloud), two or more private clouds, or some combination of both. By having the freedom to create a strategy that utilizes multiple vendors, you can pick and choose the capabilities that best suit your specific business needs and minimize vendor lock-in.

**Multicloud** deployments interconnect services from separate cloud environments for different purposes without having to connect the clouds. On the other hand, **hybrid cloud** deployments typically combine a private computing environment (on-premises IT infrastructure or a private cloud) and a public computing environment.

Since workloads, instructors, and processes often vary across organizations, there’s a lot of inconsistency around what multicloud and hybrid cloud mean. In some cases they are even used interchangeably. However, these two terms actually refer to two distinct concepts.

The primary difference between multicloud vs. hybrid cloud comes down to the type of cloud infrastructure. The term multicloud refers to using cloud computing services from more than one public cloud vendor for different workloads, while the term hybrid cloud describes when common workloads are deployed across multiple computing environments.

Serverless is a cloud computing application development and execution model that enables developers to build and run application code without provisioning or managing servers or backend infrastructure.

Serverless lets developers put all their focus into writing the best front-end application code and business logic they can. All developers need to do is write their application code and deploy it to containers managed by a cloud service provider. The cloud provider handles the rest, provisioning the cloud infrastructure required to run the code and scaling the infrastructure up and down on demand as needed. The cloud provider is also responsible for all routine infrastructure management and maintenance such as operating system updates and patches, security management, capacity planning, system monitoring and more.

**7: What are cloud-native applications?**

A cloud-native application is a program that is designed for a [cloud computing](https://www.techtarget.com/searchcloudcomputing/definition/cloud-computing) architecture. These applications are run and hosted in the cloud and are designed to capitalize on the inherent characteristics of a cloud computing software delivery model. A [native app](https://www.techtarget.com/searchsoftwarequality/definition/native-application-native-app) is software that is developed for use on a specific platform or device.

Cloud-native applications use a [microservice](https://www.techtarget.com/searchapparchitecture/definition/microservices) architecture. This architecture efficiently allocates resources to each service that the application uses, making the application flexible and adaptable to a cloud architecture.

Proponents of DevOps use cloud-native applications for their ability to promote [business agility](https://www.techtarget.com/searchcio/definition/business-agility-BA). They are designed, built and delivered differently from traditional cloud-based [monolithic](https://www.techtarget.com/whatis/definition/monolithic-architecture) applications. Cloud-native applications feature shorter application lifecycles and are highly resilient, manageable and observable.

**8: How does DevOps work on cloud?**

DevOps can be referred to as the practices of bringing development engineers and operations together to establish robust management of an application’s lifecycle.

Cloud computing pushed DevOps into mainstream adoption, as it considerably streamlined the process and allowed increased collaboration between teams. In addition to this, cloud service providers also began offering products that focused on a DevOps workflow.

**9: What is the difference between DevOps and DevSecOps?**

**DevOps** and **DevSecOps** are both strategies to improve the collaboration and speed of software development and deployment. The main difference is that DevSecOps integrates security practices throughout the process, while DevOps handles security at the end.

**10: What is cloud monitoring?**

Cloud monitoring tools were developed to keep track of things like hard drive usage, switch, and router efficiency, and processor/RAM performance. These are all excellent, and vulnerabilities. But many of these management tools fall short of the needs for cloud computing.

A cloud monitor uses the advantages of virtualization to overcome many of these challenges. Most cloud functions run as software in a constructed virtual environment. The monitoring and managing applications are built into the fabric of that environment; including resource cloud management and security.

Get a solid understanding of these concepts and connect the dots to understand how things go in the agile development model.

Write two different articles on any two topics listed above.

Prepare notes for all the topics in your GitHub repo.

**Article 1 Cloud Monitoring**

Cloud monitoring comprises a series of strategies and practices for analyzing, tracking, and managing cloud-based services and applications. As businesses scale their infrastructure and digital footprint, it becomes vitally important for IT administrators and DevOps teams to maintain visibility into the performance of their digital assets. Cloud monitoring provides an efficient way to achieve this visibility while providing an enterprise with actionable insights to improve availability and user experiences.

Given the complexities of most cloud-based deployments, monitoring performance across an entire stack of cloud applications and services can be extremely time-consuming and draining on internal resources. Cloud monitoring solutions are designed to aggregate performance data in real-time, using automated tools that track performance, resource allocation, network availability, and other important cloud-related key performance indicators (KPIs). This gives IT staff visibility into and control over their entire cloud-based infrastructure.

These tools provide near-limitless capabilities for identifying essential trends in user activity and play a key role in avoiding downtime, under-provisioned workloads, and potential security issues.

**Website monitoring.**Every business needs to ensure its websites and web services remain highly accessible, optimized, and secure. Cloud monitoring tools help to identify minor and large-scale hardware failures and security gaps so that developers and administrators can take corrective action before problems affect user experiences.

**Database monitoring.**Ensuring that the performance and health of your database management system remain intact is a vital part of business continuity. Cloud monitoring solutions actively monitor cloud database resources, tracking processes, queries, and availability of services to ensure the accuracy and reliability of database management systems, regardless of the number of instances and how they are deployed.

Today's enterprises use a variety of on-premises and cloud-based solutions. This merging of infrastructure and the operational processes that support it can lead to multicloud and hybrid cloud environments that require an added layer of monitoring, maintenance, and control. Cloud monitoring helps simplify the administration of these complex systems while reducing the internal resources necessary to manage them.

**Hybrid cloud monitoring.**Hybrid cloud environments combine the use of public cloud services and private on-premises infrastructure. This enables an organization to keep sensitive elements of their business—such as client data and transaction processes—on-premises while running other applications and services in highly scalable, reliable cloud environments.

However, a lack of end-to-end visibility in applications and services in a hybrid environment can make it difficult to identify and address critical failures or bottlenecks in software development pipelines, website and application performance, network configurations, and other IT-related process. Hybrid cloud monitoring solutions provide seamless integrations with cloud vendor performance data, providing easy-to-understand data visualizations. This brings cloud-based key performance indicators (KPIs) to the forefront, allowing teams to make better decisions regarding service deprecation, application resource provisioning, mobile agility, and database management.

**Multicloud monitoring.**Multicloud environments are similar to a hybrid cloud in that they leverage the use of an on-premises solution in combination with cloud-based computing environments, but they add the complexity of utilizing multiple public cloud providers.

Running a multicloud setup gives organizations the flexibility of choosing cloud services that best fit each of their workloads. However, there are several challenges that can occur when operating in a multicloud environment.

Moving to hybrid or mutlicloud environments can provide many advantages for scaling enterprises, especially when looking to create more agile operations. But to get the most benefit out of your cloud-based deployments, you should follow some standard cloud monitoring best practices.

**End-user experience monitoring.**While creating better internal efficiencies around process management is necessary, the primary goal of every business should be to monitor and address user experience at all levels. Gaining insights on how to improve your application performance and availability for users can have significant impacts on your bottom line and the overall sustainability of your products and services.

There are two ways that organizations can deploy digital experience monitoring in an enterprise setting:

* **Synthetic monitoring:**Also known as active monitoring, synthetic monitoring provides simulated end-user viewpoints in order to provide feedback on application performance under various conditions. This allows you to run benchmarking and baselining of your entire connected infrastructure and how it responds to complex processes and heavy workloads before applications are deployed, helping to maximize availability and overall reliability.
* **Real user monitoring (RUM):**Real user monitoring uses "real" user metrics to gain a better understanding of overall digital experiences. RUM is designed to collect all user activities in real-time, following the user's journey while measuring how backend services, application performance metrics, server load-times, and other KPIs are performing.

In complex infrastructures and hybrid cloud deployments, synthetic and real user monitoring work in collaboration with one another to provide complete visibility into the digital experience. This includes providing detailed analysis of network, backend, and frontend performance, as well as deep user insights that help organizations isolate key issues and address them.

**Move to a unified platform.**Balancing the needs of on-premises and cloud-based systems can be an uphill battle that leads to inefficiencies, lack of communication, and service instability. By moving all aspects of your infrastructure under one unified monitoring platform, you can efficiently manage all your KPIs in one place and have complete visibility into performance optimization.

**Increase automation.**Cloud monitoring automation provides enterprises with a significant increase in operational efficiency that's driven by intelligence and predictive golden signals. Through monitoring solutions deployed in private, public, and hybrid cloud environments, organizations have better visibility and control over their entire infrastructure stack. This added transparency gives teams the ability to effectively optimize all areas of their business, including website performance, resource management, application availability, and more.