CE7 SCTP - Assignment 2.1

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The objective of this assignment is to gain a deeper understanding of cloud computing, hybrid computing and traditional computing and the benefits and limitations of each.

1. **Choose a specific use case (e.g. a small business, a startup, a large enterprise) and determine which computing model would be the most appropriate for that use case, providing a detailed explanation of your reasoning.**

   - **Newly launched e-commerce website using public cloud.**

     ● Scalability
       ○ Ability to expand capabilities as and when it's required e.g. Event/Festive Season
     ● Cost-efficiency
       ○ Less upfront cost for public cloud vs hybrid or on prem. Opex vs Capex model.
     ● Infrastructure management
       ○ Cloud providers take care of hardware maintenance. Ease of management of resources from cloud console/cli/terraform/etc. All required services (VMs, Databases, Storage, etc) are consolidated with one provider.
     ● Availability
       ○ With different Ecommerce infrastructure being hosted across different availability zones making sure there is minimal operating downtime.

2. **Compare and contrast the benefits and limitations of each model, including cost, scalability, security, and flexibility.**

	Cloud	Hybrid	Traditional (On-prem)
Cost	Lower costs (pay for what you need)	Cost-efficient (balanced)	High Upfront Cost for hardware. Also cost for IT professionals to maintain hardware.
Scalability	Easy and Quick to scale up/down.	Flexible scaling as you can choose to scale on cloud or on prem	Scalable depending on hardware. Takes more time and effort to scale up. Hard to scale down.
Security (data)	High (All data stored on the cloud)	Higher (Able to store more sensitive data on-prem and keep other data on cloud)	Highest (All data stored on premises)
Security (vulnerability patching)	Shared responsibility. Only have to be concerned with maintaining security of your own VMs. Do not have to worry about infrastructure.	Shared responsibility. Able to dictate the level of security on cloud and on-prem. Eg: Procuring your own database/server for sensitive information	Full responsibility. Significant time and effort required for security maintenance and patching of both applications/OSes/firmwares of hardware/etc.
Flexibility of resources	Medium.	High.	Low.

(access to range of tools & services)	Has the most readily available tools/services ready to use by the cloud provider.	Able to leverage on both on-prem and cloud resources	Cost-dependent on the tools/resources needed. Would need to liaise with multiple vendors for a similar range of services.
Flexibility (elasticity)	Easy to move regions, increase availability, spin up and test various cloud services and destroy them later.	Middle ground between cloud and on-prem.	Depending on the range of hardware available. Eg: Multiple server racks/networks needed to maintain easy access if a service is down
Reliability & Availability	Highly reliable and available with redundancies and SLAs provided by cloud providers.	Cloud services will be highly reliable/available while on-prem services will be dependent on cost and effort.	Creating high availability and reliability similar to cloud providers is highly costly and takes significant effort. And you may not be able to do things like multi-region.
Performance	Dependent on internet connectivity; potential latency issues	Leveraging both local and cloud resources	Potentially high performance, limited by local hardware capabilities
Disaster Recovery	Good with various provider services and redundancy.	Enhanced recovery options by combining local and cloud backups	Good but can be costly.
Speed of Deployment	Fastest deployment speed	Moderate dependent on setup	Slow deployment speed
Compliance	Compliant with various regulations; data sovereignty could be an issue	Easier to meet regulatory requirements by keeping data on-prem	Easier to ensure data sovereignty and compliance, but require significant efforts
Innovation	High as they can gain access to latest tech and services from provider	High as they can add in latest tech and services from provider to the existing hybrid setup	Costly to compete with what cloud provider can offer in terms of compute and GPUs

3. **Write a report summarising your research, including a comparison and contrast of the different computing models and an analysis of the chosen use case.**

For new e-commerce startups, cloud computing is the way to go. It offers:

- unbeatable scalability to handle traffic spikes
- keeps costs down with a pay-as-you-go model.
- manage the tech, often providing attractive onboarding packages for startups, boosting availability
- Content Delivery Network (CDN) offerings to speed up content delivery to improve user experience globally
- provides built-in disaster recovery and back-up solutions, to ensure data protection for swift restoration in case of outages

- enhances and innovates the e-commerce platform, via quick access to tools like AI, machine learning, data analytics and more.
- Rapid deployment to update the e-commerce site, reducing time-to-market

Overall, this setup is more well-rounded in terms of flexibility, cost-effectiveness, scalability, performance, ease of management and innovation-friendly compared to alternatives, making it ideal for app-first businesses in today's fast-paced digital marketplace. With cloud, e-commerce companies can easily adapt to market changes and gain valuable insights with cutting edge machine learning and AI powered services into consumer behaviour, setting themselves up for success in the competitive online retail world.

Reference:

- **https://sptel.com/on-premise-vs-cloud-computing/**
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