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**Cloud Computing and Autonomic Computing: Pioneering the Future of IT**

Pros and Cons of Cloud Computing

Pros

Scalability - Cloud computing allows you to easily increase or decrease the amount of computing resources you need. It's like adjusting the size of your computer to match your needs, which is great for businesses that have changing demands. Cost Efficiency - With cloud computing, you don't have to buy expensive computer hardware. Instead, you pay for what you use. It's like paying for electricity only when you use it, which can save businesses money and make budgeting easier. Accessibility and Mobility - Cloud services can be accessed from anywhere with an internet connection. It's like having all your files and programs available on any device, whether it's a computer, tablet, or smartphone. This allows people to work from different locations and collaborate more easily. Reliability and Data Security - Cloud providers take strong measures to keep data safe and secure. They have backup systems in place, like making copies of your

files, so you don't lose important information. They also have ways to protect data from hackers and ensure it's available when you need it. Rapid Deployment and Updates - Cloud services can be set up quickly without much hassle. It's like installing a new app on your phone with just a few taps. Software updates and fixes are handled by the cloud provider, so you always have the latest and most secure versions.

Cons

Dependency on Internet Connectivity - Cloud computing relies on having a good internet connection. If the internet is slow or not working, it can make it difficult to access cloud services and get work done. Data Privacy and Security Concerns - Storing sensitive data in the cloud raises concerns about privacy and security. While cloud providers take steps to protect your data, there is a small risk of unauthorized access or data breaches. It's important to use strong passwords and encryption to keep your information safe. Vendor Reliance - When you use cloud services, you rely on the cloud provider to keep things running smoothly. It's like relying on someone else to take care of your computer. You need to choose a trustworthy provider and be aware that switching providers or moving data between them can be complicated. Limited Control and Customization - Cloud computing means you have less control over the underlying technology. It's like renting a house instead of owning it—you can't make big changes or customize everything to your liking. Some applications or configurations may not be possible in the cloud environment. Potential Downtime - Although cloud providers work hard to keep their services available, sometimes there can be disruptions. It's like when a website or app is down, and you can't use it. This can be frustrating if you rely on cloud services for important work.

Explain how Autonomic computing works in different focus area Data Centers - Autonomic Computing helps manage computer resources. It's like having a smart system that continuously keeps an eye on how the computers are doing. If there's too much work for one computer, it can automatically assign tasks to other computers to balance the workload. It can also detect when a computer

is not working properly and quickly fix the problem or switch to a backup computer, making sure everything runs smoothly. Network Management - Autonomic Computing in network management is like having a smart system that takes care of the internet and keeps it running smoothly. It can automatically detect when there's too much internet traffic or when there's a problem with the network. It can then adjust the network settings to make sure everything keeps working well, like finding alternative paths for internet traffic or blocking suspicious activities to keep the network safe. Cloud Computing - Autonomic Computing in cloud computing is like having a smart system that manages computer resources in a big, shared space. It can automatically detect when more resources, like computer power or storage, are needed by users. It can quickly allocate those resources to the users who need them, and when the demand goes down, it can free up the resources so they can be used by others. This way, everyone gets what they need without wasting any resources. Internet of Things (IoT) - Autonomic Computing is like having a smart system that takes care of all the connected devices. It can automatically detect when a device is not working properly and fix the problem, like resetting it or updating its software. It can also manage the flow of data between devices, making sure it goes to the right place at the right time. This helps the devices work together smoothly and ensures that the data they collect is used effectively. Cybersecurity - Autonomic Computing in cybersecurity is like having a smart system that protects computer systems and networks from hackers and other threats. It can automatically detect suspicious activities, like someone trying to break into a system, and take actions to stop them, like blocking their access. It can also learn from past attacks and use that knowledge to better protect against future ones. This way, it helps keep the systems and data safe from harm.

A. AWS (Amazon Web Service) AWS is a cloud compiler provider. This service is a perfect example of true cloud computing that not only offers excellent cloud services but also offers privacy, integrity, and availability of customer data. AWS provides the required resources. IT services are available at affordable prices and no pre-investment is required in the services. The customer must pay for the services they use regularly. AWS provides flexibility depending on the number of services the customer needs. If they need more than what they want they can easily go up and if they don't need the services they have they can close them off and stop paying. Another advantage of AWS is that it makes the job easier and faster.

With traditional builds, it was difficult to upgrade the application as it takes a lot of time to find the server. But with AWS cloud computing one can use hundreds or thousands of servers without any delay. AWS, therefore, allows for faster development and feeds off the system, and allows the team to try again and again. AWS not only provides system development services but also helps to deploy the system globally at a low cost. Traditionally it was difficult for a company to provide performance to distributed users so that they could focus on only one area at a time. But with the help of AWS this problem was solved and now one can send its use worldwide and show better information to customers. AWS provides a wide range of cloud computing services that assist in the development of complex applications.

Summary Cloud computing refers to the delivery of computing resources over the internet, offering scalability, flexibility, and cost efficiency. It has evolved over the years and is widely used for personal, business, software development, big data analytics, and IoT applications. Cloud computing provides benefits such as scalability, cost efficiency, accessibility, and reliability, but it also comes with considerations like internet dependency and data security. On the other hand, autonomic computing aims to create self-managing computer systems that can automatically optimize their performance and adapt to changes in the environment. It draws inspiration from the human body's autonomic functions and aims to reduce the complexity and management burden of computer systems. Autonomic computing has objectives such as self-management, self-optimization, and resource utilization. Although fully autonomous systems are still in development, the principles of autonomic computing continue to influence the design and development of computer systems, making them more self-managing and efficient.

Conclusion and Recommendation In conclusion, cloud computing has transformed the way organizations access and utilize computing resources. Its benefits include cost savings, scalability, flexibility, and remote access. Prominent cloud service providers offer a range of services, and real-world use cases demonstrate its impact across industries. However, organizations must address challenges such as data security and vendor lock-in. As cloud computing continues to evolve, technologies like serverless computing and edge computing will shape its future.

Embracing cloud computing enables organizations to innovate, scale, and optimize costs in an increasingly digital landscape.