The Performance Analysis and Comparison of Azure and AWS Hypervisor using Different Workloads in Virtualization

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Abstract:
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Abstract:
The abstraction of IT infrastructure enables the integration and pooling of IT resources to be shared across several applications to compensate for declining resources. Growing business needs virtualization offers a conceptual encapsulation of current computing resources. It generates computer systems unrestricted by physical design. The implementation objective of virtualization in cloud computing is to simplify the provision of products by providing a platform for maximizing complex IT resources in a scalable way, hence decreasing the cost of cloud computing. Hypervisors are one of the essential components of the virtualization of Hardware. Many operating systems can run simultaneously on a single physical server in a virtualized environment. For cloud computing, the hypervisor is the best way to deliver a variety of operational environments. This work will compare the cloud centre hypervisor Azure and AWS with different environments and workloads. The result shows not all hypervisors will provide the same energy and power conception with workloads and environments.

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Contents

In recent years, Virtualization Technologies have played a preeminent role in exponentially increasing software solutions' growth [1]. This leads to implementing and adopting sophisticated technologies in the new developing sector to keep up with the data transformation and to expand the data centre via server virtualization. Simultaneously, the usage of these technologies has grown to a variety of domains and varied use cases. Virtualization is becoming increasingly prevalent in the IoT sector, Network Sector, and cloud environment. In virtualization, various additional attributes are designed for multiple use cases, such as isolation, scalability, and user security [2] [3]. This enamours growth makes the field very competitive and lead us to the emergence of innovative solution. Virtualisation technologies, including hypervisor-based and container-based virtualization, are the significant growth showing hybrid approaches' development. Xen VMM enables an actual computer to boot various x86-32 OSs. Xen is an Open Source Community that originated at the Cambridge university computer laboratory [4]. The x86-32 architecture was not developed to provide complete virtualization, as outlined by Popek and Goldberg. The implementations of VMM handled the problem of capturing privileged instructions using low-level, modern methods [5]. This feature was implemented in Xen and VMWare. The operating system executes kernel mode in the physical machine, while the user mode is performed in user mode. Generally, the process has a level of execution so that OS can execute the instruction (unprivileged and privileged) overall [6]. Therefore, unprivileged instruction does not directly access the secret commands in app operating mode. There is four execution mode for X86 architecture: Ring -0 with OS running in kernel mode, Ring -1 and Ring -2 Use extra access, and Ring -3 has user mode. Following is a summary of virtualization strategies [7].

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