

Cloud Computing: A Review

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Abstract -- Cloud computing is the next generation in computation. Cloud computing is a recent trend in IT that moves computing and data away from desktop and portable PCs into large data centers. It implies a service oriented architecture through offering software's and platforms as services, reduced information technology overhead for the end-user, great flexibility, reduced total cost of ownership, on demand services, security, Efficiency and Bandwidth etc..

Keyword– Cloud Computing, Virtualization, On Demand Service, Hypervisor, Virtual Machine.

I. INTRODUCTION

Computing is the next natural step in the evolution of on-demand information technology services and products. When plugging an electric appliance into an outlet, we care neither how electric power is generated nor how it gets to that outlet it comes because of the cloud computing. Cloud Computing use the hardware and software are available easily and access in the internet

In Computing, to be considered fully virtualized, must allow computers to be built from distributed components such as processing, storage, data, and software resources. Cloud Computing use the (API) accessibility to software that enables machines to interact with cloud software. Cloud Computing has the facility of on-demand Self-service and it provides flexibility, reliability, efficiency, security and many more.

It provides On-demand delivery of computing power; consumers pay providers based on usage (pay as-you-go) similarly as public utility services like water, gas, electricity and telephony. It has main three types of service model like SAAS(Software as a service),PAAS(Platform as a service) and IAAS(Infrastructure-as a service).

II.SERVIEC MODEL

It has main three Types or Personalities

- Software-as-a-Service (SaaS): A wide range of application services delivered via various business models normally available as public offering.
- Platform-as-a-Service(PaaS):Application Development platforms provides authoring and runtime environment.
- Infrastructure-as-a-Service (IaaS): It also known as elastic compute clouds, enable virtual hardware for various uses.

III. VIRTUALIZATION

Virtual means “not a real” Virtualization is way to run multiple operating systems and user applications on the same hardware E.g., run both Windows and Linux on the same laptop. Virtualization means the separation of a service request from the underlying physical delivery of that service. It is used to dynamically partition and share the available physical resources such as CPU, storage, memory and I/O devices.

It has mainly three types of virtualization:

- Memory virtualization
 - Process feels like it has its own address space, It Created by MMU and configured by OS
- Storage virtualization
 - Logical view of disks “connected” to a machine, It has External pool of storage
- CPU/Machine virtualization
 - Each process feels like it has its own CPU .It Created by OS preemption and scheduler.

IV. USES OF VIRTUALIZATION

- Server consolidation
 - It is Run a web server and a mail server on the same physical server
- Easier development
 - It Develop critical operating system components (file system, disk driver) without affecting computer stability.
- QA
 - It is Testing a network product (e.g., a firewall) may require tens of computers and Try testing thoroughly a product at each pre-release milestone.
- Cloud computing
 - It has Amazon sells computing power and You pay for e.g., 2 CPU cores for 3 hours plus 10GB of network traffic.

V.HYPERVISOR

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Hypervisor also known as Virtual Machine Monitor Software emulating hardware to operating systems. First developed for Servers and Mainframes by IBM. Due to plentiful hardware not widely used, but fundamental method of virtualization

- Types of Hypervisor

It has mainly two Types:

1. Native Hypervisor

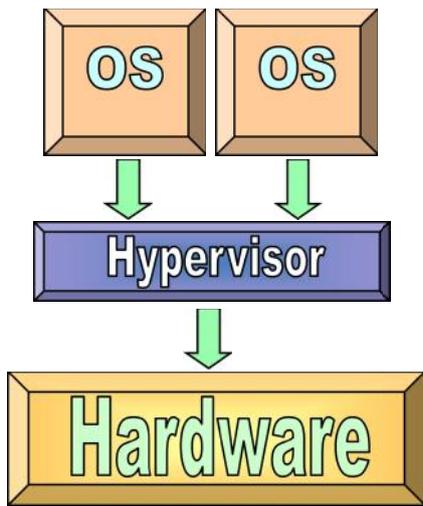


Fig 1.1 Native Hypervisor

Hypervisor directly on top of hardware and it Emulates hardware to operating systems and it is Difficult to implement

2. Hosted Hypervisor

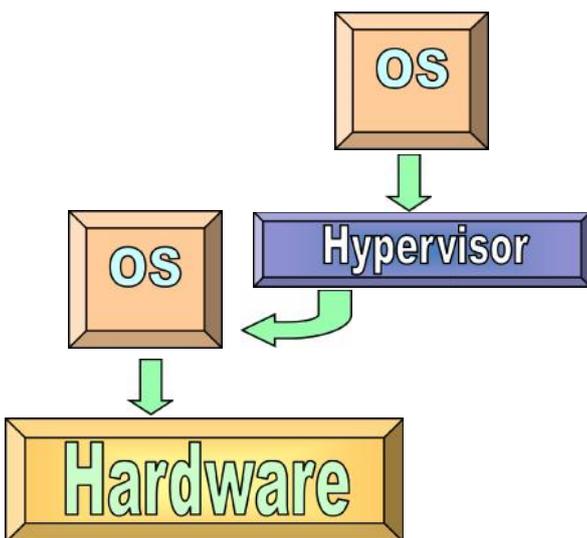


Fig 1.2 Hosted Hypervisor

It is Runs under host operating system and it is Easier to implement..It is Less efficient.

VI.VIRTUAL MACHINE

A virtual machine is a tightly isolated software container that can run its own operating systems and applications as if it were a physical computer. Behaves exactly like a physical computer and contains its own virtual CPU, RAM hard disk and network interface card (NIC) VM thinks it is a "real" computer. VM is composed of software and contains no hardware. So it offers a number of distinct advantages over physical hardware .

VII.VIRTUAL MACHINE MONITOR

It Resides as a layer below the operating system and Presents a hardware interface to an OS It has Multiplexes resources between several virtual machines (VMs) and Performance Isolates VMs from each other .

VIII.PITFALLS OF VIRTUALIZATION

- Detection/Discover

You can't manage what you can't see!.Unprepared for the complexity of what VMs exist and which are active or inactive. To overcome these challenges, discovery tools need to extend to the virtual world by identifying Virtual Machine Disk Format (.vmdk) files and how many exist within the environment. This will identify both active and inactive VM's.

- Correlation

Difficulty in understanding which VMs are on which hosts and identifying which functions are supported by each VM.It mapping guest to host relationships and grouping the VM's application is a best practice when implementing virtualization.

- Configuration management

It ensuring VMs are configured properly is crucial in preventing performance and Complexities in VM provisioning and offline VM patching.A Technical Controls configuration management database (CMDB) will provide the current state of a VM, allowing a technician to update the configuration by auditing and making changes to the template.

- Additional security considerations

If a host is vulnerable, all guest VMs and the business applications are also at risk and Leave more impact than the same exploit on a single physical server .It use an application that dynamically maps guest-to-host relationships and tracks guest VM's as they move from host to host.

- VM identity management issues

Virtualization introduces complexities for separation of duties and Identify roles and put them through the same processes you leverage for physical devices including change management, release management and hardening guidelines.

- VM network configuration control

With multiple OS sharing a single IP address, network access control becomes much more complex in a virtual network and IP sweeps will not pick these up.

- Identifying and controlling VM proliferation

VM's can pop up and move to any location in an instant. To manage this potential issue, establish and enforce a process for Virtual Machine deployment.

- VM host capacity planning

Virtualization can make understanding what applications are running and how many resources are being leveraged much more difficult. To better deal with this issue, organizations must track how many guest to host relationships exist and the configuration of the VM's.

- Intellectual property

Virtualization makes it more difficult to know who has what information. Verifying encrypted data and historical information guest VMs, can help manage and secure intellectual property.

X.CONCLUSION

Cloud Computing is an internet computing model where data is stored on servers that are on the Internet and temporarily cached on the clients' computing devices such as: desktop computers, laptops, hand-held mobile devices, etc. Cloud computing involves the supply of on-demand IT computing functions and utilities that are delivered from third party platforms as a service. On-demand services and components include: software-as-a-service, platform-as-a-service, and storage-as-a-service.

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