

Experiment No.: 02**Title: To study and implementation of Infrastructure as a Service**

Objectives: From this experiment, the student will be able to,

- Understand concepts of virtualization and to use cloud as Infrastructure as a service.
- Learn the technique and its complexity
- Understand the importance of this technique from application point of view

Hardware / Software Required: Ubuntu operating system, Virtual machine, WAMP/ZAMP server, any tool or technology can be used for implementation of web application e.g., JAVA, PHP, etc.

Theory:

Infrastructure as a Service (IaaS) is one of the three fundamental service models of cloud computing alongside Platform as a Service (PaaS) and Software as a Service (SaaS). As with all cloud computing services it provides access to computing resource in a virtualised environment, “the Cloud”, across a public connection, usually the internet. In the case of IaaS the computing resource provided is specifically that of virtualised hardware, in other words, computing infrastructure. The definition includes such offerings as virtual server space, network connections, bandwidth, IP addresses and load balancers. Physically, the pool of hardware resource is pulled from a multitude of servers and networks usually distributed across numerous data centers, all of which the cloud provider is responsible for maintaining. The client, on the other hand, is given access to the virtualised components in order to build their own IT platforms.

In common with the other two forms of cloud hosting, IaaS can be utilised by enterprise customers to create cost effective and easily scalable IT solutions where the complexities and expenses of managing the underlying hardware are outsourced to the cloud provider. If the scale of a business customer’s operations fluctuate, or they are looking to expand, they can tap into the cloud resource as and when they need it rather than purchase, install and integrate hardware themselves.

IaaS customers pay on a per-use basis, typically by the hour, week or month. Some providers also charge customers based on the amount of virtual machine space they use. This pay-as-you-go model eliminates the capital expense of deploying in-house hardware and software. However, users should monitor their IaaS environments closely to avoid being charged for unauthorized services.

Because IaaS providers own the infrastructure, systems management and monitoring may become more difficult for users. Also, if an IaaS provider experiences downtime, users' workloads may be affected.

For example, if a business is developing a new software product, it might be more cost-effective to host and test the application through an IaaS provider. Once the new software is tested and refined, it can be removed from the IaaS environment for a more traditional in-house deployment or to save money or free the resources for other projects.

Leading IaaS providers include Amazon Web Services (AWS), Windows Azure, Google Compute Engine, Rackspace Open Cloud, and IBM SmartCloud Enterprise.

Installation Steps:

- a. Openstack using devstack
- b. Sudo apt-get install git
- c. Git clone <https://git.openstack.org/openstack-dev/devstack>
- d. Cd devstack
- e. Is (you can see stack.sh in the list)
- f. ./stck.sh
- g. Give password as many time it asks
- h. ls -ls come out of devstack
- i. sudo chmod777devstack
- j. cd devstack
- k. ./stack.sh

Conclusion:

We have installed Xen as bare metal hypervisor and implemented it. It provides access to computing resources in a virtual environment. With the help of Infrastructure as a service we can build our own IT platform. We can install Windows Operating System on Ubuntu and vice versa.

LINK

<https://www.youtube.com/watch?v=jpk4i66-IU4&list=PLtGnc4I6s8duGeLlXyN2I4sS-BGkETl-8>