

Implementation Levels of Virtualization In Cloud Computing

It is not simple to set up virtualization. Your computer runs on an operating system that gets configured on some particular hardware. It is not feasible or easy to run a different operating system using the same hardware.

To do this, you will need a hypervisor. Now, what is the role of the hypervisor? It is a bridge between the hardware and the virtual operating system, which allows smooth functioning.

Talking of the Implementation levels of virtualization in Cloud Computing., there are a total of five levels that are commonly used. Let us now look closely at each of these levels of virtualization implementation in Cloud Computing.

1) Instruction Set Architecture Level (ISA)

ISA virtualization can work through ISA emulation. This is used to run many legacy codes written for a different hardware configuration. These codes run on any virtual machine using the ISA. With this, a binary code that originally needed some additional layers to run is now capable of running on the x86 machines. It can also be tweaked to run on the x64 machine. With ISA, it is possible to make the virtual machine hardware agnostic.

For the basic emulation, an interpreter is needed, which interprets the source code and then converts it into a hardware format that can be read. This then allows processing. This is one of the five implementation levels of virtualization in Cloud Computing..

2) Hardware Abstraction Level (HAL)

True to its name HAL lets the virtualization perform at the level of the hardware. This makes use of a hypervisor which is used for functioning. The virtual machine is formed at this level, which manages the hardware using the virtualization process. It allows the virtualization of each of the hardware components, which could be the input-output device, the memory, the processor, etc.

Multiple users will not be able to use the same hardware and also use multiple virtualization instances at the very same time. This is mostly used in the cloud-based infrastructure.

3) Operating System Level

At the level of the operating system, the virtualization model is capable of creating a layer that is abstract between the operating system and the application. This is an isolated container on the operating system and the physical server, which uses the software and hardware. Each of these then functions in the form of a server.

When there are several users and no one wants to share the hardware, then this is where the virtualization level is used. Every user will get his virtual environment using a dedicated virtual hardware resource. In this way, there is no question of any conflict.

4) Library Level

The operating system is cumbersome, and this is when the applications use the API from the libraries at a user level. These APIs are documented well, and this is why the library virtualization level is preferred in these scenarios. API hooks make it possible as it controls the link of communication from the application to the system.

5) Application Level

The application-level virtualization is used when there is a desire to virtualize only one application and is the last of the implementation levels of virtualization in Cloud Computing. One does not need to virtualize the entire environment of the platform.

This is generally used when you run virtual machines that use high-level languages. The application will sit above the virtualization layer, which in turn sits on the application program.

It lets the high-level language programs compiled to be used at the application level of the virtual machine run seamlessly.

Conclusion

There are in total of five implementation levels of virtualization in Cloud Computing. However, every enterprise may not use each one of the different levels of virtualization implementation in Cloud Computing. The level used is based on the working of the company and also on its preference for the level of virtualization. The company will use the virtual machine to develop and test across multiple platforms. Cloud-based applications are on the rise, making virtualization a must-have thing for enterprises worldwide.

If you are a Cloud Computing enthusiast, looking to learn more about this dynamic domain, do check out the **Postgraduate Certificate Program in Cloud Computing**, by UNext and MIT. This program is designed and delivered by the best in the industry providing its learners the perfect opportunity to master the nuances of Cloud Computing and kickstart their career in the same.