

CloudSim

- CloudSim is a framework for modeling and simulation of cloud computing infrastructures and services.
- Originally built primarily at the Cloud Computing and Distributed Systems (CLOUDS) Laboratory, The University of Melbourne, Australia, CloudSim has become one of the most popular open source cloud simulators in the research and academia.
- CloudSim is completely written in Java.
- By using CloudSim, developers can focus on specific systems design issues that they want to investigate, without getting concerned about details related to cloud-based infrastructures and services.
- CloudSim is a simulation tool that allows cloud developers to test the performance of their provisioning policies in a repeatable and controllable environment, free of cost.
- It helps tune the bottlenecks before real-world deployment.
- It is a simulator; hence, it doesn't run any actual software.
- It can be defined as 'running a model of an environment in a model of hardware', where technology-specific details are abstracted.
- CloudSim is a library for the simulation of cloud scenarios.
- It provides essential classes for describing data centres, computational resources, virtual machines, applications, users, and policies for the management of various parts of the system such as scheduling and provisioning.
- It can be used as a building block for a simulated cloud environment and can add new policies for scheduling, load balancing and new scenarios.
- It is flexible enough to be used as a library that allows you to add a desired scenario by writing a Java program.

Features of Cloudsim

Architecture of CloudSim

- The **user code** layer exposes basic entities such as the number of machines, their specifications, etc, as well as applications, VMs, number of users, application types and scheduling policies.
- The **User Code layer** is a custom layer where the user writes their own code to redefine the characteristics of the stimulating environment as per their new research findings.
- **Network Layer:** This layer of CloudSim has responsibility to make communication

possible between different layers. This layer also identifies how resources in cloud environment are placed and managed.

- **Cloud Resources:** This layer includes different main resources like datacenters, cloud coordinator (ensures that different resources of the cloud can work in a collaborative way) in the cloud environment
- **Cloud Services:** This layer includes different services provided to the user of cloud services. The various services of clouds include Information as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS)
- **User Interface:** This layer provides the interaction between user and the simulator.
- The **CloudSim Core simulation engine** provides support for modeling and simulation of virtualized Cloud-based data center environments including queuing and processing of events, creation of cloud system entities (like data center, host, virtual machines, brokers, services, etc.) communication between components and management of the simulation clock.