CC TUTE 1

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Explore CloudSim Simulation Toolkit.
- Why simulation is important for the cloud environment?
- Features of CloudSim
- Layered Architecture and basic components of CloudSim
- Install CloudSim in Eclipse.
- Try your hands on with sample projects in cloudsim.

Q1 Why is simulation important for Cloud Environment?

Using simulation tools, which open the possibility of evaluating the hypothesis prior to software development in an environment where one can perform different tests. Specifically in the case of Cloud computing, where access to the infrastructure incurs payments in real currency, simulation-based approaches offer significant benefits, as it allows Cloud customers to test their services in repeatable and controllable environment free of cost, and to tune the performance bottlenecks before deploying on real Clouds.

At the cloud provider side, simulation environments allow evaluation of different kinds of resource leasing scenarios under different load and pricing distributions. This leads to the providers in optimizing the resource access cost with focus on improving profits. Without such simulation platforms, Cloud customers and providers have to depend either on theoretical and imprecise evaluations, or on try-and-error approaches that lead to less service performance.

Q2 Features of CloudSim

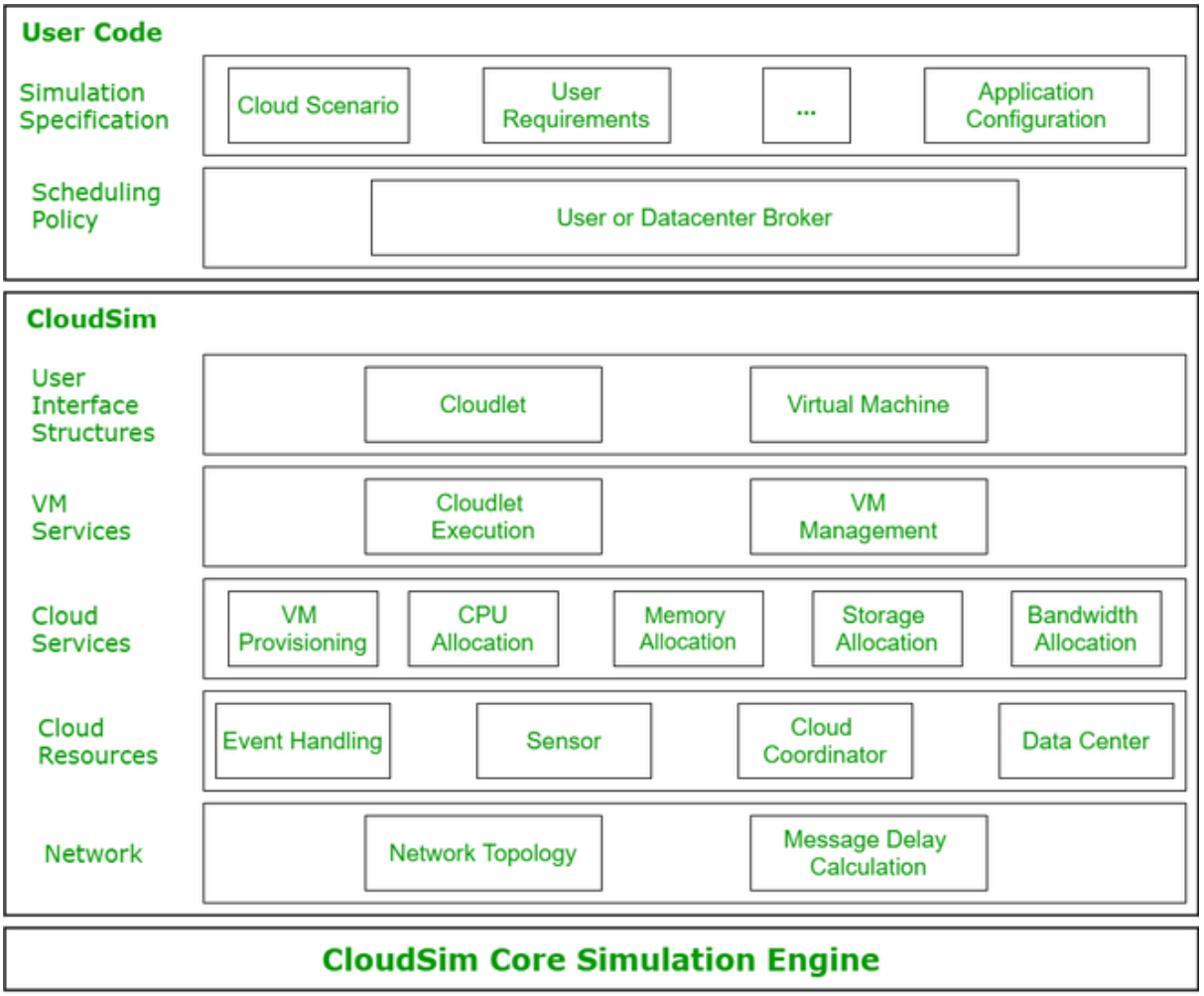
CloudSim provides support for:

1. Modeling and simulation of large scale Cloud computing data centers
2. Modeling and simulation of virtualized server hosts, with customizable policies for provisioning host resources to virtual machines
3. Modeling and simulation of application containers
4. Modeling and simulation of energy-aware computational resources
5. Modeling and simulation of data center network topologies and message-passing applications
6. Modeling and simulation of federated clouds
7. Dynamic insertion of simulation elements, stop and resume of simulation

8. User-defined policies for allocation of hosts to virtual machines and policies for allocation of host resources to virtual machines

Q3 Layered Architecture and Basic Components of CloudSim

CloudSim Architecture Diagram:



CloudSim Core Simulation Engine provides interfaces for the management of resources such as VM, memory and bandwidth of virtualized Datacenters.

CloudSim layer manages the creation and execution of core entities such as VMs, Cloudlets, Hosts etc. It also handles network-related execution along with the provisioning of resources and their execution and management.

User Code is the layer controlled by the user. The developer can write the requirements of the hardware specifications in this layer according to the scenario.