**Assignment No :- 1**

**Title :-** Study the different cloud Simulator.

**Aim :-** Compare different cloud simulators.

**Theory:-**

**CloudSim :-**

CloudSim is a new, highly generalized and extensible Java based simulation tool kit, and is actually regarded as a software framework.CloudSim has been developed by the CLOUDS Laboratory of the Computer Science and Software Engineering Department of the University of Melbourne, Australia by Prof. (Dr) Rajkumar Buyya.CloudSim uses robotics simulator Gazebo and is based on an underlying toolkit called SimJava

**1)Features:-**

1. Large scale virtualized Datacenters, servers and hosts.
2. Customizable policies for provisioning host to virtual machines.
3. Energy-aware computational resources.
4. Application containers and federated clouds (joining and management of multiple public clouds).
5. Datacenter network topologies and message-passing applications.
6. Dynamic insertion of simulation entities with stop and resume of simulation.
7. User-defined allocation and provisioning policies.

**2)Support :-**

1. Supports modeling and simulation of large scale cloud computing data centers.
2. Supports modeling and simulation of virtualized server hosts, along with customisable policies for provisioning host resources to virtual machines.
3. Supports dynamic inclusion of simulation elements, discontinuations and restarts.
4. Has support for user defined policies for allocating hosts to virtual machines (VMs).
5. Supports the creation of various data center network topologies, message-passing applications and energy-aware computational resources

**3)Limitations:-**

1) Current CloudSim cannot support both the power model and the network model at the same time.

2) The network components in current CloudSim do not support power-aware simulation. 3) The simulation of migration does not take into account the network overheads.

| **Simulators** | **Platform used** | **Programming language** | **Availability** | **Simulation Time** | **Features** |
| --- | --- | --- | --- | --- | --- |
| **CloudSim** | SimJava | Java | Open  Source | Seconds | modeling and simulation of large scale cloud computing data centers. |
| **GreenCloud** | NS2 | TCL/C++ | Open  Source | minutes | supports simulation of CPU, memory, storage and networking resources. |
| **CloudAnalyst** | CloudSim | Java | Open  Source | mili-Seconds | Graphical user interface  Experiment looping |
| **iCanCloud** | OMNET | C++ | Open  Source | Seconds | iCanCloud provides a user-friendly GUI.  iCanCloud provides a POSIX-based API and an adopted MPI library |
| **EMUSIM** | CloudSim | Java | Open  Source | Seconds | Supports loosely coupled CPU-intensive applications.Offers a combination of simulation and emulation |
| **TechCloud** | CloudSim | Java | Open  Source | Seconds | supports simulation of CPU,Graphical user interface Experiment looping. |