22AIE305
Introduction to Cloud Computing
2-0-3-3

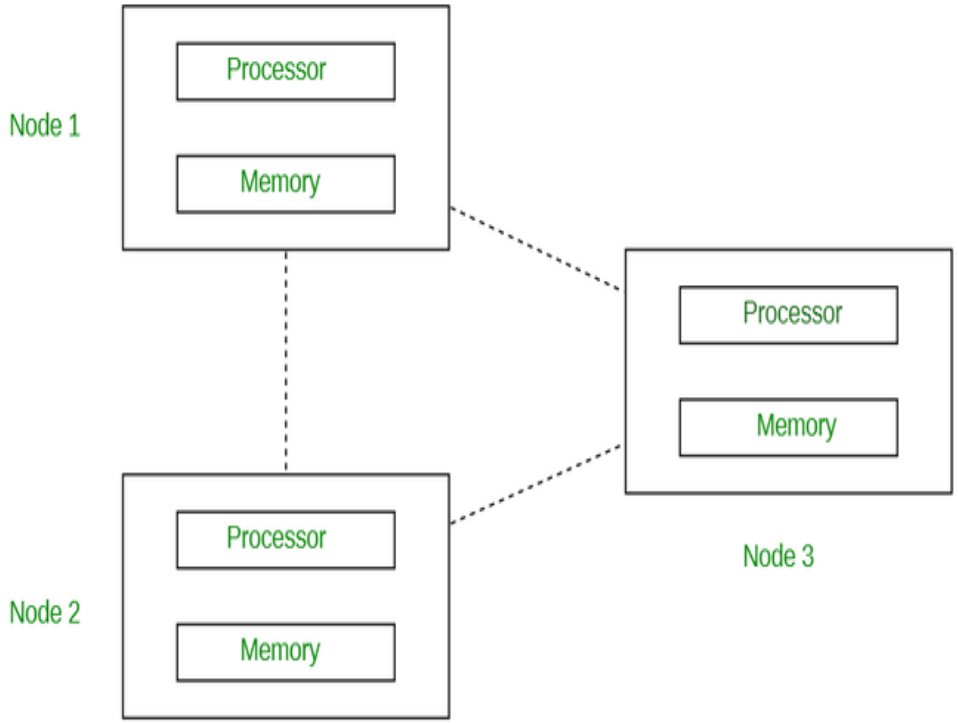
Krishnapriya P S
Dept. of Computer Science & Engineering
Amrita Vishwa Vidyapeetham

AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY

Distributed Computing Taxonomy

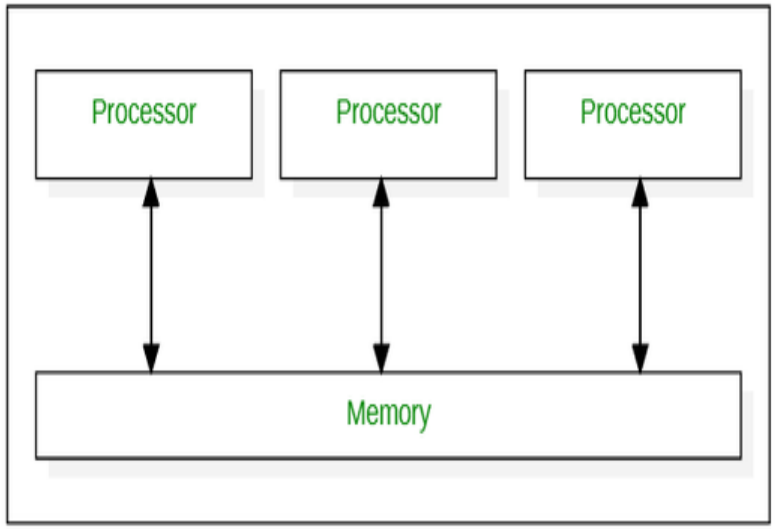
Distributed Computing

- Distributed computing is defined as a type of computing where multiple computer systems work on a single problem.
- Here all the computer systems are linked together and the problem is divided into sub-problems where each part is solved by different computer systems.
- The goal of distributed computing is to increase the performance and efficiency of the system and ensure fault tolerance.
- Each processor has its own local memory and all the processors communicate with each other over a network.



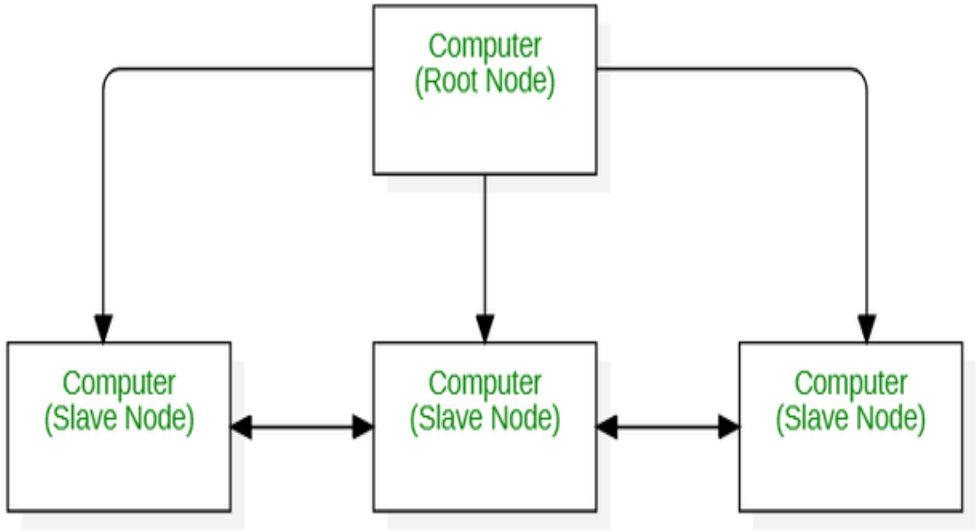
Parallel Computing

- Parallel computing is defined as a type of computing where multiple computer systems are used simultaneously.
- Here a problem is broken into sub-problems and then further broken down into instructions. These instructions from each sub-problem are executed concurrently on different processors.
- The goal of parallel computing is to save time and provide concurrency.
- In the diagram you can see how the parallel computing system consists of multiple processors that communicate with each other and perform multiple tasks over a shared memory simultaneously.



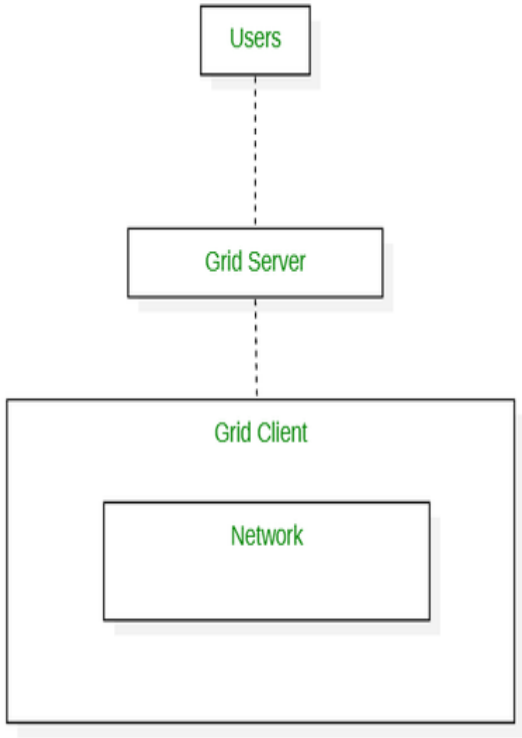
Cluster Computing

- A cluster is a group of independent computers that work together to perform the tasks given.
- Cluster computing is defined as a type of computing that consists of two or more independent computers, referred to as nodes, that work together to execute tasks as a single machine.
- The goal of cluster computing is to increase the performance, scalability and simplicity of the system.
- As you can see in the below diagram, all the nodes, (irrespective of whether they are a parent node or child node), act as a single entity to perform the tasks.



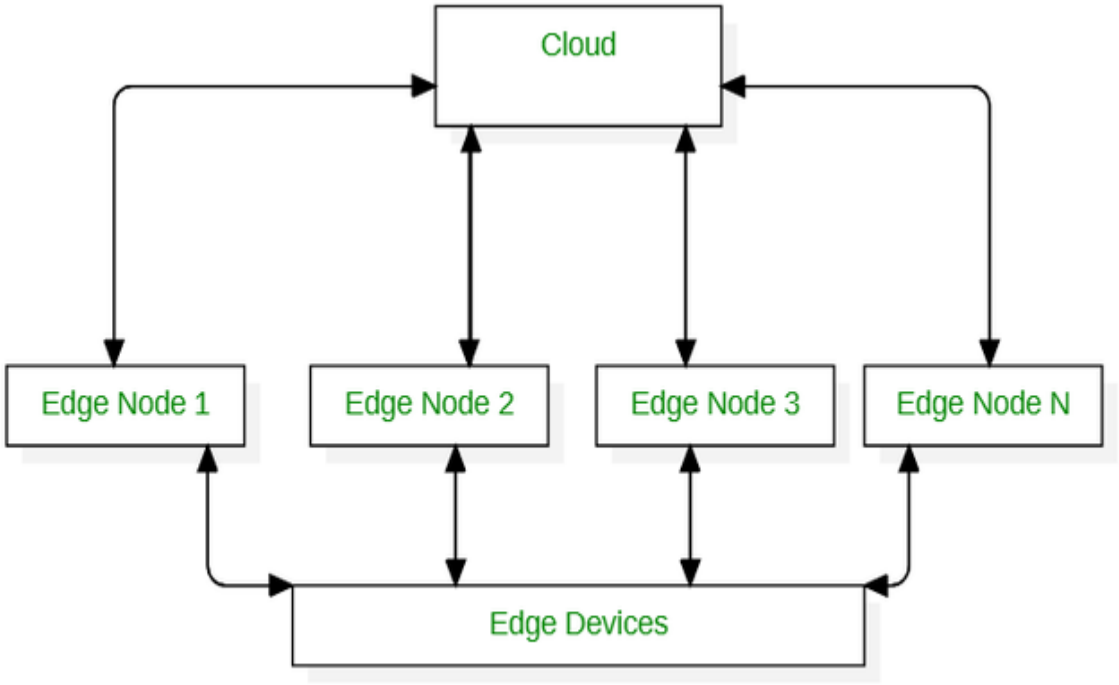
Grid Computing

- Grid computing is defined as a type of computing where it is constitutes a network of computers that work together to perform tasks that may be difficult for a single machine to handle.
- All the computers on that network work under the same umbrella and are termed as a virtual super computer.
- The tasks they work on is of either high computing power and consist of large data sets.
- All communication between the computer systems in grid computing is done on the “data grid”.
- The goal of grid computing is to solve more high computational problems in less time and improve productivity.



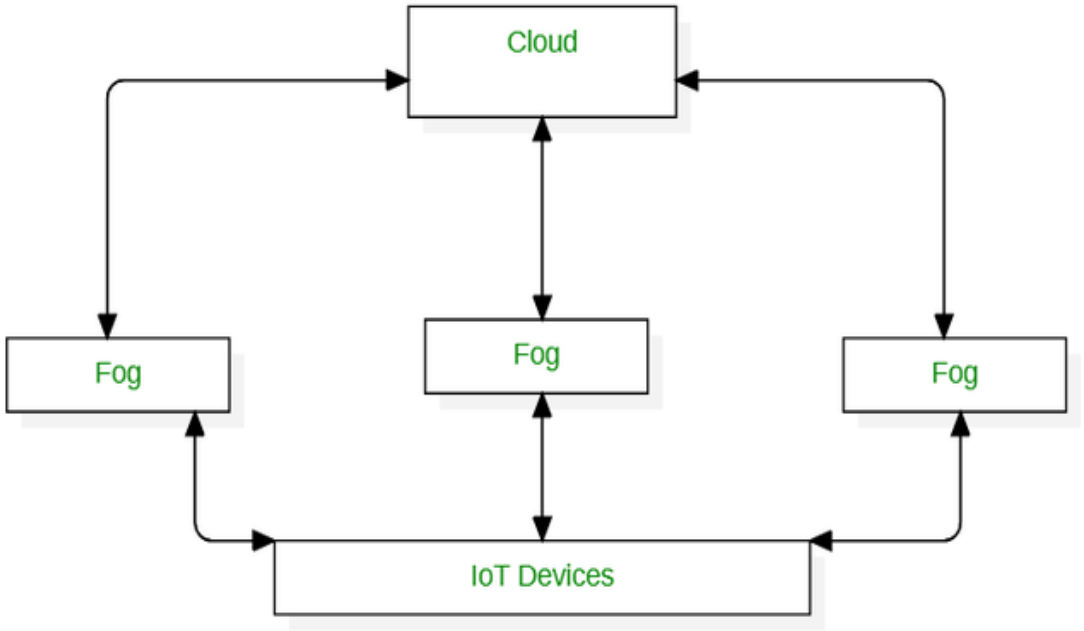
Edge Computing

- Edge computing is defined as the type of computing that is focused on decreasing the long distance communication between the client and the server.
- This is done by running fewer processes in the cloud and moving these processes onto a user's computer, IoT device or edge device/server.
- The goal of edge computing is to bring computation to the network's edge which in turn builds less gap and results in better and closer interaction.



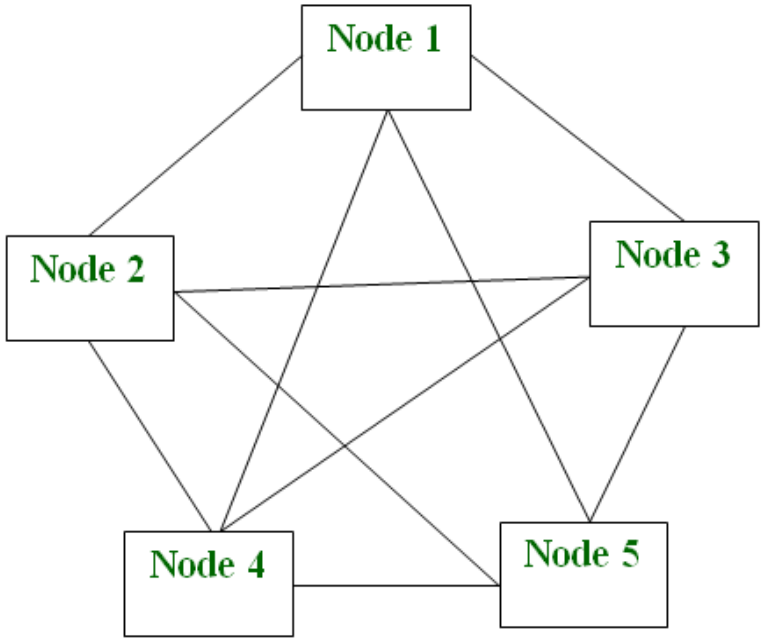
Fog Computing

- Fog computing is defined as the type of computing that acts a computational structure between the cloud and the data producing devices.
- It is also called as “fogging”.
- This structure enables users to allocate resources, data, applications in locations at a closer range within each other.
- The goal of fog computing is to improve the overall network efficiency and performance.



Peer to Peer Computing

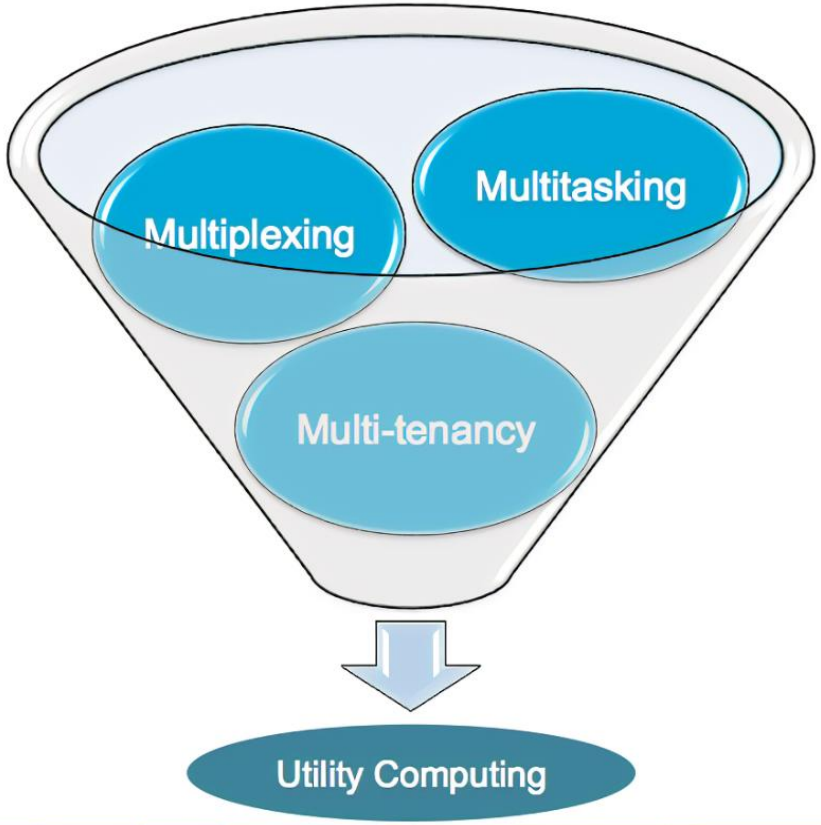
- A peer to peer network is a simple network of computers.
- It first came into existence in the late 1970s.
- Here each computer acts as a node for file sharing within the formed network.
- Here each node acts as a server and thus there is no central server to the network.
- This allows the sharing of a huge amount of data. The tasks are equally divided amongst the nodes.
- Each node connected in the network shares an equal workload.
- For the network to stop working, all the nodes need to individually stop working.
- This is because each node works independently.



P2P Architecture

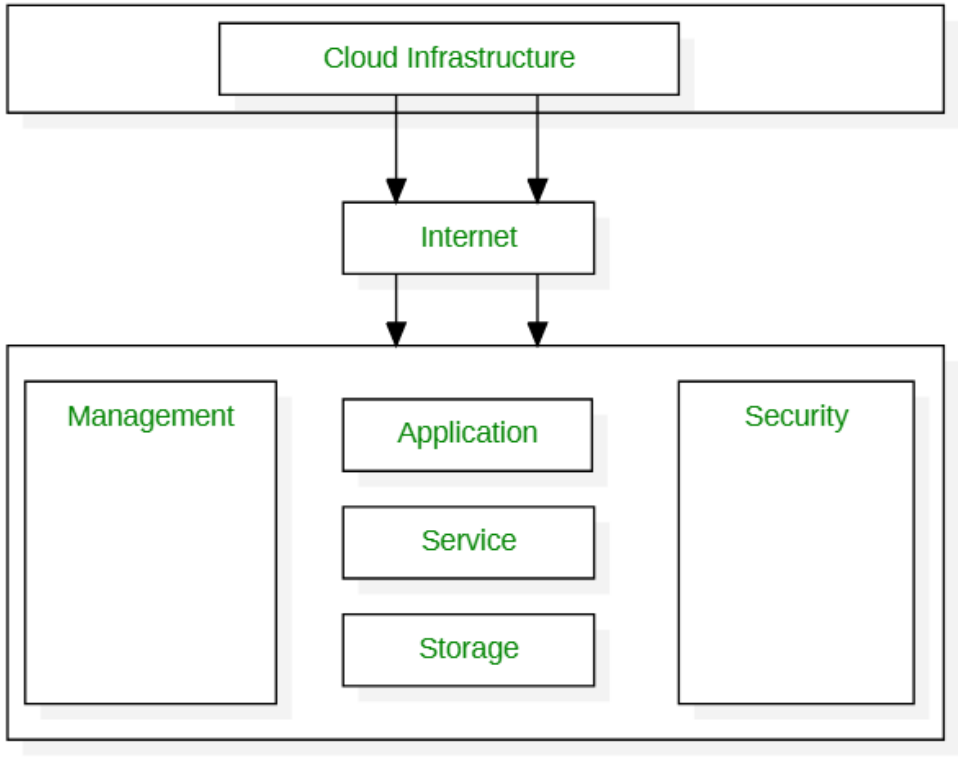
Utility Computing

- Utility computing plays a significant role in business models and gives a unique service provider to the customer IT services according to pay-per-use methods.
- A few IT services are provided to customer storage, software applications, and computing power.
- So for any questions and advice required for deployment in the business model, the service providers provide the unit divisions to the company.
- As the term “Utility” refers to basic amenities like electricity, water, gas, the basic software requirements for a business model are provided by utility computing.



Cloud Computing

- Cloud is defined as the usage of someone else's server to host, process or store data.
- Cloud computing is defined as the type of computing where it is the delivery of on-demand computing services over the internet on a pay-as-you-go basis.
- It is widely distributed, network-based and used for storage.
- There type of cloud are public, private, hybrid and community and some cloud providers are Google cloud, AWS, Microsoft Azure and IBM cloud.



Namah Shivaya