**Bringing computation closer towards user network: Is edge computing the solution?**

* The current cloud computing paradigm augments the capabilities of resource-constrained devices, but it cannot fulfill the requirements of location awareness, mobility support, and low latency.
* Edge computing aims to provide location awareness, maintain low latency, support heterogeneity, and ameliorate Quality of Service (QoS) for real-time applications.
* Edge computing can resolve several issues in various scenarios, such as real-time image processing, gaming, smart grid, smart traffic lights and connected vehicles, smart building control, and smart health environment.
* **Taxonomy:**

A taxonomy on the edge computing paradigm is classified broadly into the following attributes: a) access technologies i.e WiFi, 3G, 4G, 5G, Ethernet.

b) Computing devices i.e switch, router, base station, computer system.

c) Computing paradigms i.e fog computing, cloudlet, MEC.

d) Objectives i.e latency minimization, utility maximization, bandwidth saving etc.

e) Enabling technologies i.e virtualization, SDK, mobile technologies etc.

f) Computational hierarchy i.e core cloud, edge server, end nodes

g) Applications i.e IoT smart environment, health care, retail etc.

* **Requirements For Edge Computing:**
* **Reliability**

Three techniques can be applied to improve the reliability of edge computing: (a) check pointing, i.e., periodically saving the state of end devices and user services, (b) replication of edge servers and services in multiple geographical locations, and (c) rescheduling of failed tasks.

* **Scalability**

Edge computing can be scaled by (a) adding a new point of services (geographic expansions), (b) adding new service nodes to existing points of service, and (c) utilizing cloud interplay.

* **Security**

Edge computing needs to define sandboxes for user applications to ensure data isolation and monitor resource usage. Network Function Virtualization (NFV) can be applied to network nodes to ensure security and isolation of user domains.

* **Resource Management**

NFV and software-defined networking (SDN) are potential technologies that can enable ease of management of edge resources.

* **Interoperability**

Edge computing needs to provide interoperability and interactivity among multiple heterogeneous devices and service architectures.

* **Open Research Challenges:**
* **Seamless Edge Execution Handover**

Seamless edge execution handover becomes a challenging task because of the non-deterministic mobility behavior of the user and intrinsic limitations of the wireless medium.

* **Lightweight Security and Privacy**

Lightweight security and privacy mechanisms are necessary because of the battery-powered nature of the end users’ devices.

* **Real-Time Data Processing**

Providing best services at the edge of user network in a certain environment where load and data are growing at tremendous rates has become a real challenge.

* **Social Collaboration**

In a market where different companies offer different edge devices as a service provider, social collaboration could not be made possible because of heterogeneous device architecture and contentious issues.