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School Of Computer Science and Engineering
(SCOPE)

Fat Notes

Fog and Edge Computing

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Contents

1 Module 1

Marks: 10

- Discuss Models
- Hierarchy Aspect
- Relevant Technologies

1.1 Limitations of CIoT (Cloud to Edge): BLURS

- Bandwidth
- Latency
- Uninterpted Connectivity
- Resource Constraint (Power)
- Security

1.2 Advantages of Fog

- Hierarchial
- Flexible
- Scalable

1.3 Cloudlet Computing

Smaller Compute Resources compared to data centres deployed closer to edge resources aimed for mobile applications with lower latency. (Cluster of small data centers generally one hop away)

1.4 Virtualisation ??

1.5 Mist Computing ??

1.6 Advantages of Fog and Edge Computing: SCALE

- Security
- Cognition
- Agility
- Latency
- Efficiency

1.7 What FEC Provide

- Storage: Cache
- Compute: VM
- Acceleration: FPGA/GPU
- Networking: TCP/UDP (Vertical Networking), Bluetooth/Zigbee (Horizontal Networking)
- Control: Deployment, Actuation

1.8 Hierarchy

- Core Network
- Inner Edge: LAN
- Middle Edge: Fog

- Outer Edge: Sensors and Actuators

1.9 Buinses Models

- X as service (XaaS): Provide hardware, infrastrucre, software as service
- Application: Efficient Data Processing, or solutions to a problem
- Support

1.10 Challenges

- Vendor Lockin
- Vertical Integration across all the layers
- Security Risks
- Increased Complexity
- Interoperability across hardware acrsos the layers
- Limited Support

2 Module 2

10 Marks

- C2F2T: Uses Casess & Metrics
- Formulas

2.1 Federated Edge Resources

Process of sharing and connecting resources at the edge of network.

2.1.1 Challenges

1. Networking Software Defined Network **(SDN)** is potential solution for orchestrating edge resources.
2. Management Rapid service migration between nodes cause high overhead and unsuitability.