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D17B/01

EXPERIMENT 11

Aim: To have a basic understanding of implementation application of Fog Computing.

Theory:

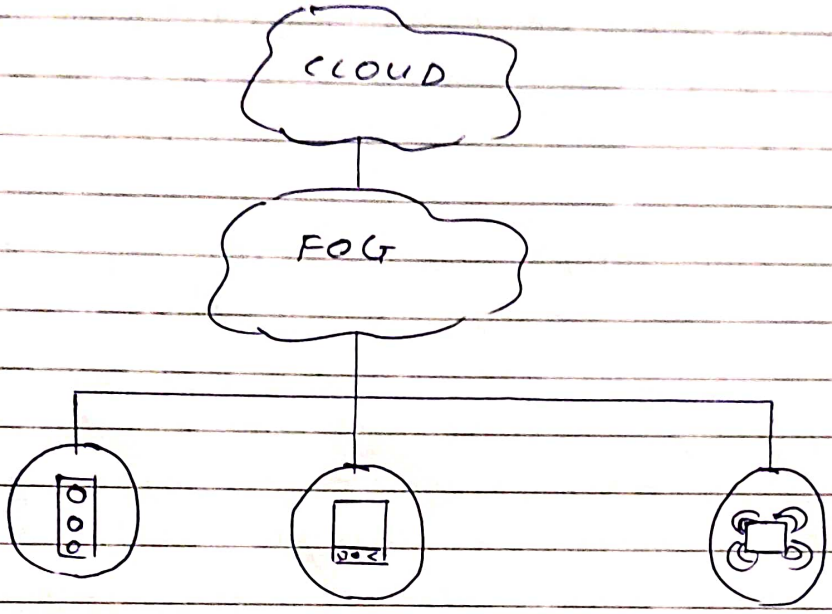
What is Fog Computing?
Connecting the things to cloud

Fog Computing extends the concept of cloud computing to the network edge, making it ideal for internet of things (IOT) and other applications that require real time interactions.

Fog computing is the concept of a network fabric that stretches from the outer edge of where data is created to where it will eventually be stored, whether that's in the cloud or in customer's data center.

Fog is another layer of a distributed network environment and is closely associated with cloud computing and the internet of things (IOT).
Public infrastructure as a service (IaaS) cloud vendors can be thought of as a high-level, global endpoint for data, the edge of the network is where data from IOT devices is created.

FOG COMPUTING



Fog computing is the idea of a distributed network that connects these two environments. Fog provides the missing link for that data needs to be pushed to the cloud, and what can be analyzed locally, at the edge explains Mung Chiang, dean of Purdue university's college of Engineering and one of the nation's top researchers on fog and edge computing.

According to open fog consortium, a group of vendors and research organizations advocating for the advertisement of standards in this

technology, fog computing is a "system-level horizontal architecture that distributes resources and services of computing, storage, control and networking anywhere along the continuum from cloud to Things"

Benefits of Fog Computing:

Fundamentally, the development of fog computing frameworks gives organizations more choices for processing data wherever it is most appropriate to do so. For some application, data may need to be processed as quickly as possible - for example, in a manufacturing use case where connected machines need to be able to respond to an incident as soon as possible.

Fog computing can create low-latency network connections between devices and analytics endpoints. This architecture in turn reduces the amount of bandwidth needed compared to if the data had to be sent all the way back to a data center or cloud for processing. It can also be used in scenarios where there is no bandwidth connection to send data, so it must be processed close to where it is created. As an added

benefit, users can place security features in a Fog network, from segmented network traffic to virtual firewalls to protect it

Applications of Fog Computing

Fog computing is the nascent stages of being rolled out in formal deployments, but there is a variety of use case.

1. Connected cars: The advent of semi autonomous and self driving cars will only increase the already large amount of data vehicals create. A fog computing environment would enable communications for all of these data sources both at the edge (in the car), and to its end point (the manufacturer)

2. Smart cities and smart grids like connected cars, utility systems are increasingly using real-time data to more efficiently run systems. There are issues where data is remote areas, and data needs to be aggregated, fog computing and secure these.

3. Real time analytics: A host of use cases are for real time analytics. Fog computing deployments can help facilitate the transfer of data between where it's created and a variety of places where it needs to go.

How does fog computing work?

A fog computing fabric can have a variety of components and functions. It could include fog computing gateways that accept data IOT devices have collected. It could include a variety of wired and wireless granular collection endpoints, including routers and switching equipments. Other aspects could include customer premise equipment (CPE) and gateways to access edge nodes.

Higher up the stack fog computing architectures would also touch core networks and routers and eventually global cloud services and servers.

A huge amount of data, generated by IoT is growing up exponentially based on monitor operational states.

Those IoT devices are generating an avalanche of information that is disruptive for predictable data processing and analytics functionality, which is perfectly handled by the cloud before explosion growth of IoT.
Fog computing structure confronts those applications with powerful complement functionality of cloud framework, based on deployment of micro clouds (fog nodes) at proximity edge of data sources.

Conclusion: Some experts believe the expected roll out of 5G mobile connections in 2018 and beyond could create more opportunities for fog computing. We have seen fog computing.