

## Unit 3 – Cloud Architecture

### Edge Computing

Edge computing is a distributed computing method that handles part of the processing and storage of data closer to the data sources (sensors), the “edge” of the network. It can happen on the actual IoT devices or a dedicated local edge server.

Even though it is related to cloud and fog computing, all of them serve a different purpose. Unlike cloud computing, where most of the actual application logic is done in a centralized manner, and fog computing, that helps in filtering the important information from the heaps of data gathered from the device, edge computing is tasked with preprocessing the raw data from the sensors to send it further up the chain. The main use of edge computing is to alleviate the required bandwidth to send the streams of device-generated data and processing power needed for said data that the network, respectively the data center would've had to provide. It also helps with latency issues that would rise from sending the data to and from the centralized server.

It is not necessary per se, since we've done without it the last couple of decades. It is needed for fields where time-sensitive events are happening or the aforementioned limitations. The transition is slowly happening due to the rise in computational power of smaller devices and personal devices and the motive to take advantage of that progress.

### Cloud Architecture in IoT Architecture

The cloud architecture can be one of the layers of an IoT device architecture. To be exact, in a three-layer architecture (application – network – perception) it represents the application layer, where it delivers the application specific services to the user. In a five-layer architecture (business – application – middleware – transport – perception) it functions as the middleware component, used to store, process and analyze vast amounts of data passed through the transport layer by the devices, which might utilize cloud computing or big data processing resources.

It's a centralized method to process and present data and brings a lot of advantages over traditional private business servers. Outsourcing has brought better accessibility, reduced costs for already implemented services like traffic and data analysis, load distribution and better scalability, since the workload can be passed to already connected idle devices.

### Resources:

- Course slides
- <https://www.netburner.com/learn/architectural-frameworks-in-the-iot-civilization/>
- <https://www.ibm.com/cloud/what-is-edge-computing>
- <https://www.onlogic.com/company/io-hub/fog-computing-vs-edge-computing/#:~:text=In%20a%20nutshell%2C%20edge%20computing,purposes%2C%20such%20as%20data%20filtering.>