2019

# EDGE IS THE NEW CLOUD

BRIGHTRED RESOURCING LIMITED

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# Edge is the New Cloud

The advent of Cloud Computing technology has revolutionised the IT world. Every day we see a new technology or service being introduced. In a way to optimise resources to the core and meet changing business needs, the Cloud is always on the path of transformation. Edge Computing is the new buzz in Cloud circles. With Edge Computing, businesses are now able to bring Cloud solutions closer to their infrastructure.

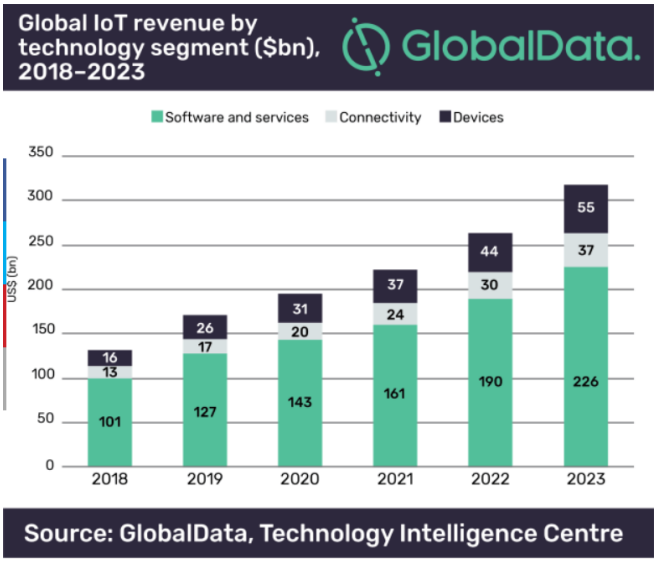
## An overview of Edge Computing

From mainframes and server-based UNIX systems to personal computers and Cloud networks, the IT world has come a long way. Edge is the new kid on the block. Edge Computing can be defined as a type of mesh computing network of data centres that store and process data collected from Edge devices or Internet of Things (IoT) devices locally and push that data to a Cloud repository. Simply put, Edge Computing is about processing the data at/near the source of the data instead of sending the entire data to the cloud. As critical data is processed locally, the Cloud is relieved of a major back haul of traffic.

## The size of the IoT Market

With the advent of IoT, there has been a sudden influx of a variety of devices into the network. The IoT market is growing at a rapid pace and in terms of market revenues as well as in varying technologies. According to Global Data, the global IoT market earned a revenue of $130 billion in 2018.

This value is expected to touch $318 billion by 2023, growing at a Compound Annual Growth Rate (CAGR) of 20% during this period.




According to MarketsandMarkets, the global IoT market was valued at $170.57 billion in 2017. This value is expected to reach $561.04 billion by 2022, growing at a CAGR of 26.9% between 2017 and 2022.

Analyst firm IDC reports that global technology spending on IoT will grow at a CAGR of 13.6% between 2017 and 2022, and reach $1.2 trillion by 2022. According to a Forbes article, the global IoT market was valued at $151 billion in 2018.

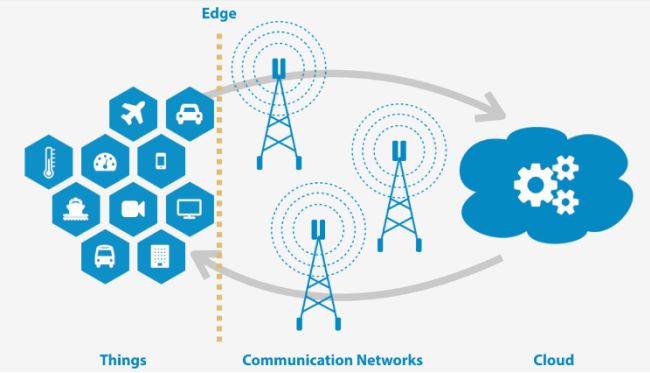
Ericsson forecasts that the member of cellular connections in their network will grow at a CAGR of 30% between 2017 and 2022 to reach 3.5 billion connections. These numbers showcase the enormity of the IoT influx in corporate networks.

Firstly, be it a sensor, mobile phone, laptop or a server, each device in the network deals with huge volumes of data. Sensors collect data in real-time and continuously send this data to a central repository that is normally located in the cloud, potentially thousands of miles away from their geographical locations. This huge volume of data contains information, but not all of it is relevant. For instance, a wind turbine or an oil rig might have hundreds of sensors that collect data about the health of the structure. As this non-critical data is continuously sent to the Cloud server, the Cloud server is burdened with huge volumes of data. Instead, the sensors can send this data to a local server and generate a daily report and send this aggregate report to the cloud server. By doing so, organisations can reduce network traffic while optimising big data, making it more relevant and useful.

Secondly, there are certain locations that have poor network connectivity. As such, continuously sending the entire data to the Cloud server and then receiving instructions from the Cloud might not be a feasible option. Instead, the data can be processed at the datacentre so that only critical updates are sent to the Cloud server.

Thirdly, latency is another concern. For instance, banks and financial institutions deal with mission-critical data. Instead of sending this data to the Cloud, organisations can process it at the data centre in synchronisation with the Cloud server to avoid latency issues.

# HOW IT WORKS




All the Edge devices connected in the network will send the data that they collect to a local form factor that comprises of compute, memory and storage. This data is processed locally and based on the pre-defined metrics and AI analytics, all or some portions of the processed data is sent to the main central repository located in the data centre or in the Cloud.

## There are basically three types of edge computing models:

### Local IoT Devices

A simple local network with a range of IoT devices

### Local Data Centre

A local data centre that comprises of high computing resources for data storage and management

### Regional Data Centre

A regional Edge data centre is one that supports one or more local data centres and is located between the Cloud and the local data centres.

# Factors Driving Edge

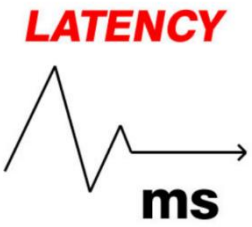
- Constrained 4G systems
- Increasing implementation of 5G system
- Exponential growth of mobile traffic
- Mobile and wireless traffic accounts for majority of network traffic
- Mobile traffic is exceeding PC traffic
- Increase in mobile network speed

# THE BENEFITS…

Edge Computing brings amazing benefits to the organisation. Here are a few of them.

## 1. Say no to Network Latency

Edge Computing significantly improves speed of business processes as all data acquired from IoT devices is processed locally. As data is analysed locally in real-time, business operations are quick and offer faster response times. It means latency is reduced and network performance is improved.




Domo reports that the world is currently generating 2.5 quintillion bytes of data every day. This number is going to touch 44 zettabytes per day by 2020. Similarly, Cisco reports that the 3.4 zettabytes of data travelling in Cloud networks every year will increase to 14.1 zettabytes by 2020. Considering the fact that the world is going to experience data traffic as big as this, network traffic jams and latencies are a certainty. With Edge computing, only relevant data travels through the network.

## 2. Say No to Single Point of Failure


Edge Computing eliminates the risk of a single point of failure. Contrary to traditional Cloud network settings wherein everything is centralised, Edge Computing distributes data and processes across multiple devices.

In case of an outage, only a single device or a small network entity is disrupted which can be quickly resolved. However, the system keeps running without interruption. In addition, data that is distributed across multiple devices reduces data theft risk at any given point in time. Along with security, compliance is met as data is stored and processed locally.

## 3. Say No to Service Outage

Another benefit of edge computing is reliability. As data processes are mostly done at the network Edge, end users enjoy seamless and reliable network connectivity. As such, network outages, latency issues and sluggishness are significantly reduced. In case of an outage, only a portion of the network is affected which means end users still

enjoy a seamless service as IoT devices are self-efficient in operating on their own.

## 4. Scale at your will with reduced CAPEX costs


Organisations that manage private and dedicated data centres are often limited by resources in terms of scalability. Investing heavily on the physical infrastructure might result in dead investment in case the organisation has to realign their networking strategies to suit changing business needs. With Edge Computing, organisations are now able to use IoT innovation and leverage the less-expensive local network while synchronically working with the centralised Cloud infrastructure. By spreading the expenses across IoT devices and Cloud infrastructure, organisations can significantly reduce infrastructural and operational costs.

In addition, Edge Computing offers the flexibility for businesses to combine legacy infrastructure with their future estate as IoT devices act as intermediaries and bring a greater level of interoperability among IT systems.

# Edge Computing Usecases

Edge Computing is quickly gaining momentum. In addition to IT solutions, Edge Computing is serving several other segments too. For instance, the Highways Agency can use IoT sensors to identify traffic levels and adjust signals accordingly. It means vehicles don't have to wait for a green signal when there is no traffic on the road. Similarly, a parking space in a shopping centre can be effectively managed with Edge Computing delivering drivers updated information about the availability of parking spaces in real time. As such, traffic is streamlined while vehicle owners save time. As these processes deal with temporary and insignificant data, there is no need for companies to send it back and forth from local data centre to the Cloud. An aggregate data set can be sent to the Cloud for storage and analysis on a day-to-day basis.

GE uses edge computing to manage gas turbines and MRI machines.

Autonomous vehicles require real-time processing of data and faster response times that is only possible with Edge Computing.

Waymo, formerly known as Google self-driving project, combines Edge and Cloud networks to offer self-driving solutions.

Looking at the enormous growth in this segment, several IT companies are coming forward to offer Edge Computing solutions. For instance, Amazon offers several tools that help organisations to instantly setup Edge Computing solutions and effectively manage them with ease.

Amazon Lambda@Edge is a powerful tool available in Amazon CloudFront that enables organisations to run Edge

applications closer to the users, eliminating the need to run multiple servers or manage infrastructures in multiple locations. The good thing about this tool is that you pay only for the compute resources consumed by your users. Similarly, Amazon Greengas IoT offerings provides Edge gateway and Edge analytics for a complete IoT Edge portfolio. Microsoft and Google also offer solutions. Both Microsoft Azure and Google Cloud offer Edge gateways and edge analytics in their IoT offerings.

## Edge Vs Fog Computing

Fog Computing is another new term that is interchangeably used for Edge Computing. Often, people get confused with these two terms. Fog Computing is a term that was coined by Cisco. While Edge Computing is about bringing Cloud architecture to the edge of the network or as close as possible to the physical infrastructure, Fog Computing is the standard that defines how the Edge Computing architecture would run. Simply put, Fog Computing is the standard and Edge Computing is the application of that standard.

A key difference between Edge and Fog Computing is the location where the intelligence or processing is placed. In a Fog Computing architecture, the intelligence is placed at the local area network. The data collected from the IoT devices at the LAN-level is transmitted to a gateway and then to the processing server. However, in an Edge Computing network, intelligence is placed at the device-level. However, it is not easy to differentiate between both architectures as Edge Computing can use multiple end points.

## The Bottom Line

Despite being a relatively new technology, Cloud Computing has already undergone multiple innovations in a very short space of time. By the time you master a technology, a new one comes up. As such, it is important for IT guys to proactively watch the Cloud space and quickly adapt to changing trends. For an organisation, choosing the right candidates for the right roles is a challenging task, considering the innovation that is happening within the Cloud. Brightred has developed the capability to help organisations choose the right candidate for the right role at the right time.

Contact us today to meet our Edge Computing experts!

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