ormuco

EDGE COMPUTING AND THE INTERNET OF THINGS:

How and Why Cloud Computing Is Becoming Less Relevant

EVOLUTION OF COMPUTING

When computing was introduced in the early 1960s, it was mainly offered in a centralized fashion. That's when mainframes were in vogue and the trend persisted for almost two decades.

The IBM PC appeared in 1981 and with it started the Client-Server generation, with distributed computing and advanced networking.

Speaking of networking, we started the new millennium with the Internet that opened a whole new set of opportunities for computing. Later on, the almighty Cloud made its appearance, and so we were back to centralization, with enterprise workloads shipped to cloud data centers and workers connecting to them from anywhere in the world.

Now, here we are, looking at the future of computing. Devices have become so smarter that they can autonomously interact with servers through public networks, empowering humanity with the Internet of Things. We're entering the 5G phase that promises faster network connectivity. Now is the time when real-time analytics are more than ever helping businesses improve their processes.

Intelligence is the new trend and the edge of the network is where it needs to happen. Welcome to the edge computing era!

Mainframe
Centralized
1960-1970

Client-Server
Distributed
1980-2000

Mobile-Cloud

Edge Intelligence
Distributed
2020-

ABOUT THE INTERNET OF THINGS

The raise of interest for edge computing has followed the rise of the Internet of Things (IoT). Webopedia refers to it as the ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems.

'Ever growing' is a well chosen term indeed, especially as Cisco predicts that 50 billion devices will be connected to the Internet of Things (IoT) by 2020. We can just imagine the level of network bandwidth usage this is going to generate over the next years if we keep up with the cloud computing approach.

WHAT IS EDGE COMPUTING?

Edge computing refers to the process of computing data 'at the edge' of the network.

An edge computing infrastructure literally consists of computers and small-scale data centers 'at the edge' of a certain network or geographic location. Computing is done directly at – or near – the source of data, as opposed to relying on a cloud-based data center that may be thousands of miles away.

The small-scale data centers that process this data are usually called 'cloudlets'. As the diminutive name implies, they are smaller versions of their 'big brothers' – the enormous, enterprise-scale data centers that could handle cloud data from tens of thousands of companies.

Instead of focusing on raw power and long-term storage capacity, edge computing cloudlets focus on:

- Fast response rates
- Low latency
- Streamlined processing of basic data

This allows them to provide a much faster response and minimize delays, because they're closer to the source of data.

The source of data can be intelligent devices like:

- **Common** end-user devices such as smartphones or tablets
- **Wearables** such as fitness watches or virtual reality headsets
- **Sensors** such as temperature sensors, motion sensors or smoke sensors in homes or foodplants
- **Healthcare applications or medical tools** using real-time data for patients
- **Connected cars**, including self-driving vehicles
- **Offshore drilling rigs** used in the oil industry
- **Access control devices** using voice command for authentication

And of course, this list is not exhaustive. These connected devices can be referred to as IoT devices or edge devices. Most of them require real-time data processing and near-instantaneous analysis that they can't do by themselves.

WHERE CLOUD COMPUTING FAILS...

Cloud computing fails to respond to such a need because it requires data to be transferred to data centers for processing. These data centers are located 'far' from the device, meaning the information has to go through different public routers.

This raises two main concerns for the applications:

- Network latency, because of the time it takes to transmit the data back an forth between the data centers and the devices.

- Data privacy, because sensitive information such has personal health metrics are being sent to public networks with all the involved security risks this can represent.

...AND HOW EDGE **COMPUTING SUCCEEDS**

Edge Computing Will Decrease Latency, Enhancing Efficiency for Real-Time Analytics Apps

Real-time processing needs infrastructure at the edge or close to it.

Cloudlets being in a location that is geographically close to the edge devices, they're ideal to solve issues such as network bandwidth overuse and lack of flexibility that are often caused by large-scale, central cloud databases.
So, the key benefit of an edge computing approach is that it offers much lower latency for client applications. 'First-step' computing can be done at the 'edge' of a system, reducing latency dramatically and ensuring high uptime and reliability. In turn, this makes IoT applications more efficient.

Edge Computing Will Provide The Local Processing Power That Cloud Computing Can't

Edge computing is, by design, a distributed architecture, rather than a centralized one. It responds to the processing need for one application or set of applications, connecting smart devices in one regional area to processing power locally.

In other words, edge computing tends to have an overall lower processing load, compared to centralized cloud computing architectures. However, this is not a bad thing – because systems in cloudlets are used to:

- Quickly analyze data they receive from client devices
- Send back the results of the computation to these devices

Also, because they act as **'gateways'**, they'll send the processed information to a central cloud system for long-term storage or further treatment. Thus, the name **'edge server gateways'** or **'IoT gateways'.**

CLOUD COMPUTING
IS ANCILLARY TO EDGE COMPUTING

Should we conclude that edge computing spells the end of cloud computing? No.

Cloud computing is still relevant because you can take advantage of a secure, private cloud to manage specific workloads that are less time-sensitive within your ecosystem.

Edge computing is not designed to replace cloud computing. Rather, it's designed to address some of its shortcomings. These shortcomings include geographical inflexibility, data privacy and high latency. It will offer big data analytics, storage and archiving capabilities that a cloudlet will not.

In return, cloud computing offers the ancillary solution for the needs that edge computing cannot cover. We're speaking of long-term archival and retrieval of data, resource-consuming processing of large data sets, periodical reporting, etc.

This means edge computing and cloud computing can complement each other perfectly, resulting in a more efficient and responsive architecture. Coupling both edge computing and cloud computing will guarantee your success.

EDGE COMPUTING vs. CLOUD COMPUTING: THE FINAL WORD

So, the question of edge computing vs. cloud computing is not a question of which one is better. It's a question of how you can integrate both services into your service options, as a service provider.

Cloud computing and edge computing work the most effectively when they are used together – and in an intelligent edge cloud full stack platform, such as Ormuco's software.

Providing edge computing services will help you develop new markets and bring in more customers and clients, particularly as artificial intelligence (AI) becomes more commonplace for things like automated driving, interpreting images through facial recognition from security cameras, and more.

When you offer an edge computing platform using Ormuco Stack, you'll be able to address many of the drawbacks of a traditional cloud computing stack – and integrate both service offerings into a single one.

50 billion devices will be connected to the Internet of Things (IoT) by 2020 (Cisco)
(Cisco)

5.6 billion IoT devices will utilize edge computing in 2020
(Business Insider)

50% of developers are lacking the necessary technology to deliver on IoT expectations
(Progress)

ORMUCO STACK FOR EDGE COMPUTING DEPLOYMENTS:
ASK FOR YOUR DEMO!

So, how do you get started? Offer your company benefits from a more widely-distributed approach to computing with Ormuco.

1. The software will deploy quickly and easily on x86 commodity hardware, not just enterprise systems. Many of the Iot gateways being x86-based equipment, you can rely on Ormuco to build your images and automatize their deployment.

2. Ormuco allows easy management of multiple clouds, including both edge computing 'cloudlets' and full-scale enterprise cloud systems. Workloads can be deployed on bare metal, virtual machines, and containers such as Kubernetes. So you get to manage your edge and cloud deployments within the same tool.

3. Ormuco automates your infrastructure. It combines artificial intelligence and machine learning to provide you with an infrastructure that self-installs, self-operates, auto-scales and self-heals. You can deploy thousands of cloudlets in different regions of the world with only one person overseeing all. Nothing can stop your growth.

4. Ormuco gives you all the tools to build applications. Do you need a database? The platform offers popular data stores such as MySQL, MongoDB or Redis. Need WordPress, RabbitMQ, Joomla or Jenkins? It's all there.

5. Ormuco Stack comes with more features, such as a sophisticated billing engine that knows how to bill at the edge. Seamless authentication in IoT scenarios involving roaming devices is also offered.

With just basic equipment, you can start implementing edge computing for yourself. If you need to know more about computing at the edge, we're the best resource in the business – and we'd love to talk to you.

Ready to Get Started?
Ask for a Custom Demo

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About Ormuco Inc.
Founded in 2008, Ormuco's mission is to be a leader in the deployment of edge computing as the preferred solution for data processing.

Great User Experience 2018 Award
Awarded by FinancesOnline

Rising Star 2018 Award
Awarded by FinancesOnline

Cloud28+