

Source: This paper from Queen's University and University of Melbourne researchers

'Fog' computing might be the answer for IoT, but it won't be easy



Derrick Harris [Follow](#)

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Fog computing (aka edge computing, aka moving more computing to distributed servers and connected devices, and less computing to the cloud), is a feasible and likely performance-boosting architecture for the Internet of Things, according to a research paper published last week. According to some investors, it's also the future of computing. However, as with most things involving the internet, the devil is the details—especially when it comes to who's paying for it.

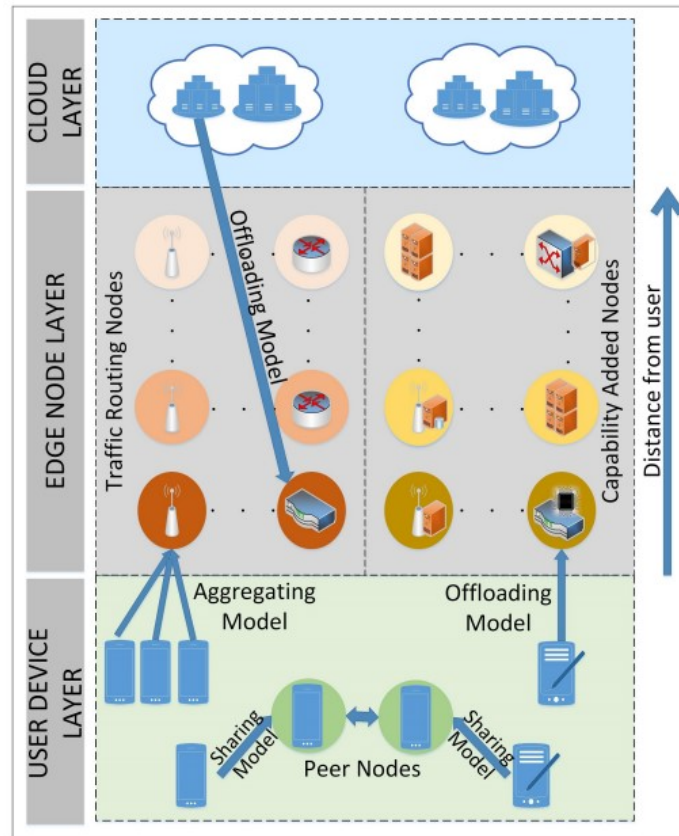
The study, authored by a group of researchers from Queen's University in Belfast and the University of Melbourne, highlights several possible architectural models for fog computing—ranging from the types of necessary network nodes to the viability of containers as the primary unit of compute. A study conducted by the paper's authors shows significant reductions in response and data transfer when running a mobile game like Pokemon Go on an edge network, rather than relying on a centralized cloud server for processing data and traffic.



The edge. Source: Andreessen Horowitz / Peter Levine

That's all well and good—and is increasingly viewed as conventional

wisdom within the tech community—but the paper’s real value is highlighting the various other factors that anyone looking to roll out an edge network must consider. There are technical hurdles around security, privacy, and performance monitoring that are exacerbated by the possibility of peer networks and heterogeneous devices. And, of course, there are lots of economic issues to consider.



A diagram showing some possible models for delivering edge computing. Source: This paper

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Those will likely be the biggest challenges to overcome for anybody not named Amazon or Google or Microsoft or Apple or Samsung or Facebook or ... you get the point. As last week’s paper points out, potential issues to consider include:

Who owns the network and/or edge nodes in a distributed network.

Who foots the bill for traffic as workloads cross networks, server nodes and P2P nodes.

Who will own relationships with customers across networks and nodes.

How will user SLAs be managed and who will own them.

How will quality of service remain constant considering the

potentially high number of users and diversity of workloads on edge networks.

The large platform companies we all know are already figuring out strategies to own as much of the edge architecture as they can:

They continue to build new data centers around the globe in order to minimize latency and deal with data-privacy laws.

Facebook is building out micro data centers specialized for specific applications and workloads.

Amazon Web Services, already the world's largest cloud provider by a mile, has launched a new service that lets developers move certain tasks to the device while, of course, connecting to the AWS cloud for the heavy lifting.

Assume Google, Apple, Microsoft, Samsung and other platform/cloud providers are also building out their edge infrastructure.

When computing does become more decentralized, their applications and their developers' applications will still run on a relatively standardized (if not centralized) infrastructure, optimized for performance. None of these companies own the networks—not a small consideration considering the gloomy fate of net neutrality—but money can buy a lot of things.

The big challenge will be for everybody else, who will need to figure out how to maximize performance for their connected devices and applications amid a sea of tricky business and technical issues. The researchers suggest a marketplace approach could be the answer, but also note that implementing a viable one could be a complicated affair.

Until then, expect the fog to look a lot more like low-hanging clouds.

