



What is telco federated edge?

The idea of federating the telco edge has been around for some time and there is strong operator interest in pursuing this opportunity. However, it's yet to be seen how federation will work in practice. This article is our take on answering some of the open questions on this topic.

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If you've been following the telecoms industry, you might have come across the terms 'federated edge' or 'telco edge federation'. Major industry players, including the GSMA (mobile industry organisation with 750+ members), Bridge Alliance (a telecoms alliance of 34 major operators in APAC and MEA), and ETSI (European industry standardisation organisation), plus others have been exploring the idea of federating the telco edge for some time and there is significant operator interest in pursuing this. It is, however, yet to be seen how edge federation will work in practice. This article answers the key questions of how this will work technologically, what it aims to do, what progress has been made to date and the potential business models telco federated edge opens up.

What is federated edge?

In a nutshell, **federating the telco edge is the process of interconnecting operator edge platforms to enable the consistent delivery of edge computing services across networks and national boundaries.**

GSMA has proposed the idea of developing a single **Operator Platform** which, in Phase 1, will "federate multiple operators' edge computing infrastructure to give application providers access to a global edge cloud to run services through a set of common APIs". Additionally, GSMA's Telco Edge Cloud (TEC) group aims to align multi-access edge computing business models, charging principles, and commercial deployments and is currently working with 20+ leading operators to promote the initiative.

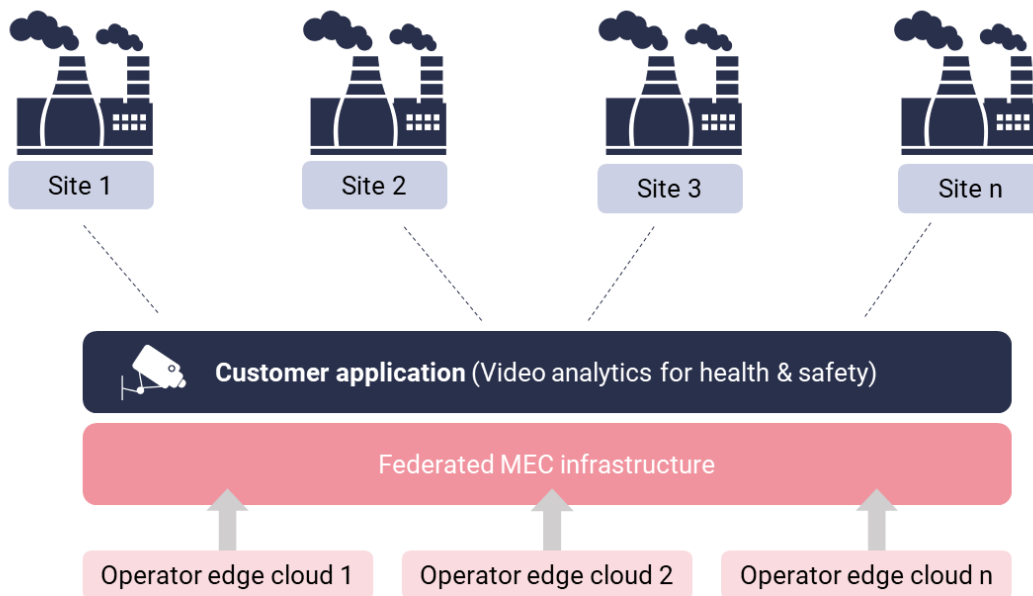
"What we are trying to do is to enable interfaces between operators and simplify APIs to enable federation" - Faisal Zia, Telco Edge Operator Platform Lead, GSMA.

On the other hand, Bridge Alliance is working on interconnecting its own telco members' edge clouds to give unified propositions to enterprise customers with the goal of interconnecting with other aggregators down the road. The aggregators could include non-telco edge platforms, hyperscale cloud providers, etc.

"We can't operate in siloes; our goal is to ultimately achieve hub-to-hub interconnection with other edge aggregators to enable a truly global offering" - Claudio Checchia, Senior Manager in Research & Analysis, Bridge Alliance.

These initiatives have created a great deal of interest in a future where the telco edge is federated. We visualise what that future would look like through an example use case: video analytics for health and safety. This is where enterprises use video sensors to automatically detect any incidents which pose health and safety risks, e.g. identifying a fire, a machine malfunctioning, two employees fighting, etc.

How will it work?



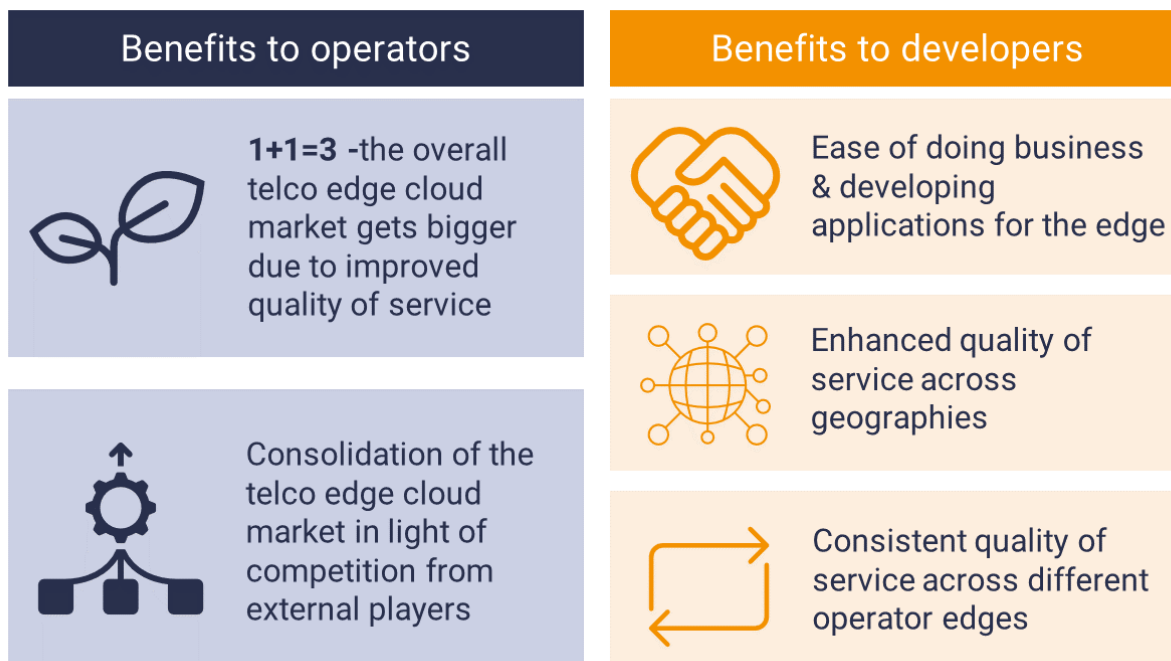
In an ideal world, an edge application developer interfaces with a single platform to gain access to global/regional edge cloud services. In this example, the customer is a developer of video analytics solutions for health and safety in manufacturing facilities. Naturally, the manufacturers' sites, that the video analytics solution serves, are likely to be geographically dispersed, and it is in the customers' best interests to provide a consistent quality of service across all manufacturing sites, regardless of location. Hence, the ability to interact with a single point of contact (the platform) to get consistent and reliable telco edge services without having to worry about navigating multiple relationships with operators in different countries is an attractive proposition for application developers.

Other important benefits of edge federation include roaming support and low latency interconnection between the edge clouds of operators serving the same geographical area. Additionally, federation supports the integration of edge and network capabilities enabling integrated offerings and mobility. This would apply to the video analytics health and safety use case in a smart city context. For example, in a situation where a random event occurs, bringing a large number of people together in one area in a town or city, the video analytics application may need to move to a new edge and/or scale up accordingly.

Benefits of federated edge

Both operators and application developers will benefit significantly from edge federation. For telecoms operators, it will increase the size of their opportunity and improve the proposition they can take to customers; for developers, it will ease their ability to work with telecoms operators and allow them to scale telco edge-based applications.

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Reality check: progress has been made but there is still work to do

There are a number of POCs, developer workshops, trials, and industry initiatives aimed at advancing telco edge federation. As part of the GSMA TEC Pre-commercial Trials Foundry project, **KDDI** came together with Deutsche Telekom (DT) to develop a mobile application proof-of-concept on augmented reality leveraging remote rendering and visual positioning and running on a common platform (MobileEdgeX) across the edge networks of KDDI and DT.

Another **trial** by Bridge Alliance, Singtel, and SK Telecom (SKT) demonstrated cloud gaming on Singtel's and SKT's MEC platforms deployed through the Bridge Alliance Federated Edge Hub. This POC validated the possibility to host and deliver edge compute resources across multiple geographies through a federated platform.

Most recently, Bridge Alliance, MobileEdgeX, Singtel and Telefonica **announced** that they successfully achieved hub-to-hub interconnection between the Bridge Alliance Federated Edge Hub (FEH) and MobileEdgeX Edge-Cloud platform allowing edge applications to be deployed across different edge platforms and regions served by each hub. Another important **announcement** was at MWC'22 where Telefónica unveiled the CAMARA industry initiative in partnership with GSMA, the Linux Foundation, DT and other players with the mission of defining APIs for exposing network capabilities to third parties.

Despite this positive traction, it's important to note that there have been previous attempts by operators to work jointly on industry-wide projects which have not necessarily delivered the desired outcomes e.g., API programme, IoT, mobile identity/authentication, etc.

But, there is reason to believe that it will be different this time around. First, considering their stagnating revenues and significant investments in 5G, telcos see edge as the key to delivering revenue growth in the future. In fact, according to our recent **research**, the edge computing addressable revenue will reach US\$543 billion by 2030, with revenues from edge infrastructure growing at the fastest pace (CAGR 102% during 2020-

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2030). Secondly, operators are increasingly looking to take a front-seat role with end-customers, i.e. developers and enterprises. Thirdly, there is the potential threat of competition from non-telcos, which is encouraging telecoms operators to work together and ensure they create a differentiated value to customers. The combination of these factors creates a more favourable environment for telco edge federation to succeed.

Challenges of making federated edge happen

It is important to recognise that there is still a long road ahead for edge federation to become a reality as operators work together to solve a range of technical and commercial challenges.

Technical challenges

To materialise the concept of a unified telco edge offering, operator mobile edge computing (MEC) platforms must be adapted significantly. ETSI has been working on a set of **standards** that operators must comply with to futureproof their MEC platforms for federation. At the same time, it's important to keep in mind that to capitalise on the current momentum, the efforts to meet technical requirements must be accelerated. Open APIs are a potential solution to this problem. The challenge is to adapt those APIs in a way that will drive their adoption by the developer community.

Commercial challenges

The operator community needs to define the commercial arrangements suitable for federated edge computing. While a significant amount of work has been done to address the technical challenges, it's quite early days when it comes to the commercial side of things.

"MEC federation requires an extremely modular approach to enable a unified telco edge offering in the future. But beyond this technical challenge, it is even more important to address the problem of the business model for MEC federation, that ultimately will drive the technical solutions adopted"- David Carrera, Co-founder & CTO, Nearby Computing

Commercial models

We at STL believe that there are 3 viable commercial models for federated telco edge:

1. **Aggregator model:** a 3rd party aggregates the individual members' edge offerings and sets uniform pricing across the federation footprint.
2. **Settlement model:** No aggregator, members settle differences internally at an agreed settlement rate. For example, if operator A's customers use operator B's MEC platform equivalent to 100 vCPU hours, while operator B's customers use operator A's MEC platform for 50 vCPU hours, operator B will settle the difference in fees for the 50 vCPU hours at the agreed settlement rate. This model allows operators to pursue their own commercial strategies.
3. **Roaming model:** No uniform pricing, prices are determined through bilateral agreements between operators. In some cases, prices will also differ within a single operator based on demand and availability of edge resources. This model gives operators more flexibility on pricing but complicates the system which is not aligned with developer goals.

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