

Monetizing Fixed Wireless Access Broadband

The Challenge

Fixed wireless access (FWA) broadband has established itself as a key growth contributor in many operator's 5G portfolios. Delivering high-speed mobile broadband to consumers and small, medium and large enterprise segments where fiber plant is unavailable (or expensive to provision or wholesale), FWA's flexibility and adaptability have become a big part of its appeal. That adaptability, however, comes at a price. Estimates suggest that FWA connections can generate 80-90 times the traffic that a normal smartphone connection does for only 1-2 times ARPU uplift. This can quickly result in mobile networks becoming overloaded, with some operators forecasting that FWA-derived traffic could be responsible for generating 30-50% of their entire network traffic. That increase also has a dilutive impact on overall revenue per unit of network capacity.

That heavy traffic loading is the result of many devices connecting to a single network connection with no offload facility. In normal smartphone connections, some 70% of the traffic generated offloads onto wi-fi networks which then ends up, typically, on fixed fiber or copper broadband services; only 30% of that traffic directly hits the mobile network. With FWA services, 100% of the traffic generated from those multiple connected devices ends up on the mobile network. That network was designed for the statistical multiplexing of many low-moderate level traffic generators, such as smartphones, not high, persistent traffic generators, such as FWA connections.

While some advocate provisioning additional spectrum in the mid-band (~3GHz) or mmWave-band (~28GHz) range or use techniques such as cell/sector splitting to increase available capacity, this all comes at a cost, both in additional spectrum licensing and the backhaul and transport network investment to support it.

Operators need to find the right balance between the market need for a profitably monetized FWA offering and the operational issues outlined.

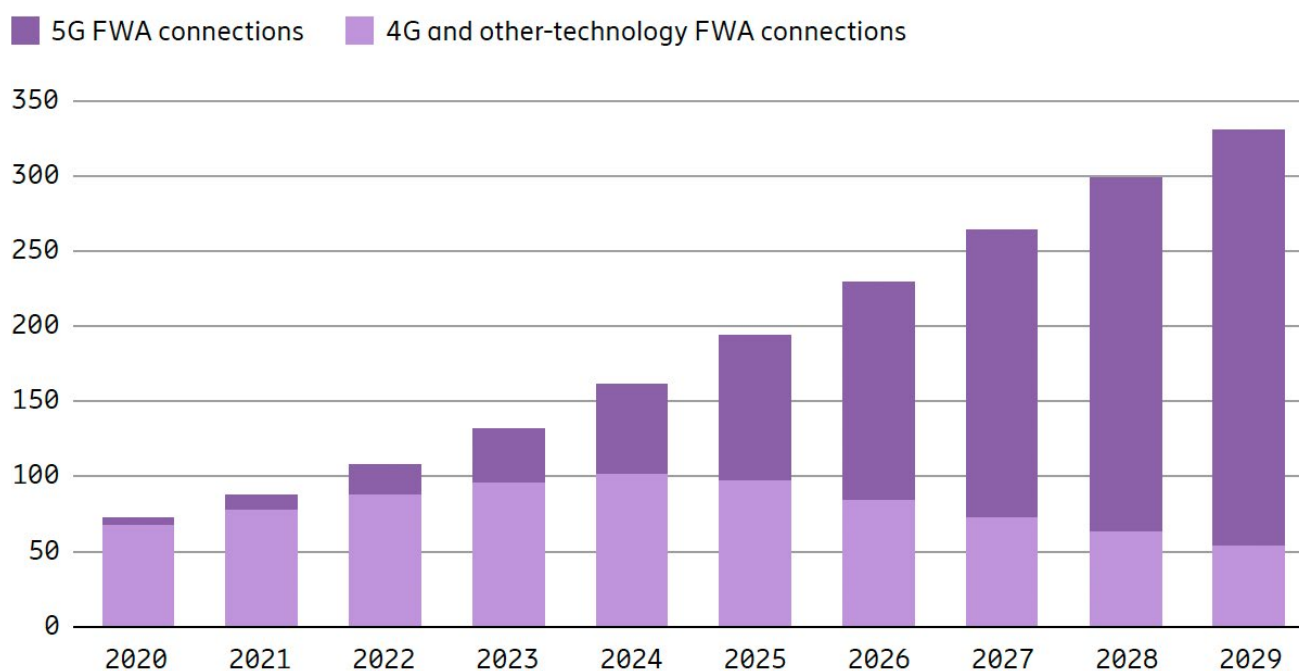


Figure 1: The Forecast Rise in Global 5G Fixed Wireless Access Connections (millions)

Source: Ericsson November 2023 Mobility Report

The Solution

The two main areas of operation that need focus from operators to help deliver that balance are positioning and pricing and traffic control. Handily, both converge at the monetization plane of operator networks, making an integrated, real-time monetization solution the ideal control point solution. MATRIXX Dynamic Billing allows operators to enact a commercially-led approach to the

challenge, giving them the flexibility and agility to adapt to undulating commercial and network conditions in real-time from the same control point. Given that commercial nature, pricing incentives and rewards can be used to help shape user behavior proactively, hopefully reducing the need for reactive “hard-coded” policing.

Positioning and Pricing

Fixed wireless access broadband should be viewed predominantly as a *complementary* offering to fiber to premises/home (FTTH/H) broadband and only occasionally as a *replacement*. Expensive to deploy rural broadband services are an example of where it may be considered as an alternative solution to fiber. Mobile networks were simply not designed to be cost-effective enough to support large numbers of persistent, high-traffic generators. A positioning compromise is needed. For those operators with in-house fiber assets, that could follow the approach of positioning FWA as an entry-level broadband offering, delivering in the region of ~20 – 100Mbps alongside fiber to the premises offerings that offer from 50Mbps – 1Gbps, as an example. That overlap gives operators the freedom to choose the most appropriate technology at the lower end. It may also be appropriate for FWA to be positioned as the technology of choice for “social broadband” offerings, where it is legislated by regulators or governments.

For those operators who do not own in-house fiber assets, the entry-level FWA offering may be increased to, say, 20-200Mbps to reduce the need for wholesaling fiber services from a third party. Crucially, however, FWA will never be a cost-effective solution for ALL broadband services, and some wholesaling of fiber services will be required.

From a pricing perspective, having the control point located in an integrated monetization solution is where the real operational flexibility emerges. The first consideration operators need to grapple with is whether to offer FWA services based on speed (like fixed broadband) or on volume (similar to mobile smartphones). Emotionally, studies have shown that people attach greater value to something that is charged by usage as opposed to an all you can eat offering. Furthermore, aligning fixed wireless access (in the consumer market) with other household/family offerings into a digital self-help “single pane of glass” app (covering FWA, smartphones, IoT devices and one-off purchases etc.) offers great potential for cross-sell/upsell and increased wallet share opportunities for the operator. This points to a stronger case for pricing FWA services on a volume/pay-as-you-use basis. The ability to offer attractive time-of-day packages (~30% reduction in charges between midnight and 6:00 am or similar during off-peak periods during the daytime, as examples) to encourage delaying heavy downloads to off-peak periods, trading of unused FWA data into credits for other services or offering data boosters for smartphones in the “family plan,” further emphasizes why the converged charging platform is the ideal control point for FWA services.

Traffic Control

Controlling traffic volumes through throttling techniques typically contravenes standing net neutrality rules or in-country regulations. Using techniques such as de-prioritizing FWA traffic when certain parts of the

network are heavily loaded and using cell ID or cell tracking area IDs to target this as appropriate is both acceptable and beneficial. Also, controlling the FWA customer premises equipment (CPE) and broadband

service to limit usage to the home location and perhaps two other secondary locations (using cell ID/postcodes) also allows for some upside flexibility in service delivery to the consumer, while protecting the operator from potential multi-deployment fraud. CPE devices that support femtocell technology to re-radiate 5G signals indoors add the benefit of preserving a high-quality cellular signal indoors, as well as offering the opportunity to keep higher priority traffic (such as telecommuter traffic) cellular end-to-end, enforced through device QoS

mechanisms. Putting that type of control in the hands of the user via a digital self-help app reinforces the wisdom of using the converged charging engine and monetization plane as the key control point. It also negates the need for “hard-coded” network speed enforcement or policy, which may again contravene standing regulations.

The key to traffic control is the combination of responding to traffic surges in real-time *and* in the areas of the network that specifically require it.

Deployment Scenario

With an access agnostic core and Dynamic Billing solution at the heart of the network, the Quality of Service (QoS) (and, consequently, Quality of Experience (QoE)) can be controlled in real-time, providing an instantaneous control point to facilitate operators commercial and network performance/load objectives.

Implementing those commercial objectives dynamically via the requisite quality of experience settings end-to-end,

across all types of user access, including FWA services, can then be enacted by the Policy and Control Function (PCF) under the direction of the Dynamic Billing solution.

Figure 2 depicts the MATRIXX Dynamic Billing solution deployed in a fully converged 5G core, used to charge for and control the QoE delivered to users across mobile and FWA-based devices.

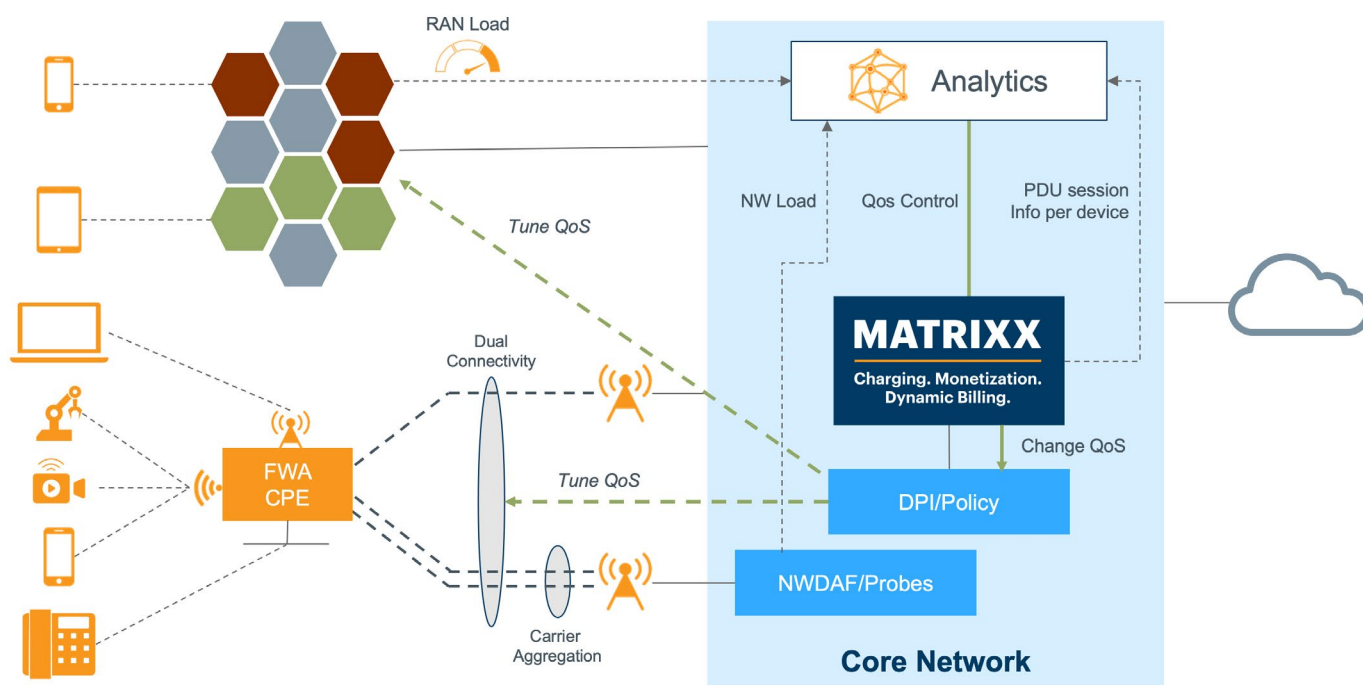


Figure 2: Control of Fixed Wireless Access QoS using MATRIXX

RAN and core load/performance information is delivered to an analytics platform via network/RAN/transport probes and the Network Data and Analytics Function (NWDAF) in real-time.

The analytics platform can use the combination of operator KPI/SLA objectives across the access points (e.g., prioritize mobile cellular traffic over FWA at certain times), RAN/core load information and session information from MATRXXX and apply AI/ML algorithms to determine the next actions to take with regards to “tuning” QoS on specific service data flows in order to satisfy network objectives.

Once the analytics platform decisions are formulated, this could result in multiple API calls to the MATRXXX platform to tune the QoS being delivered for certain services/access types.

The MATRXXX Dynamic Billing solution will transform those API calls into specific network actions (e.g., notify operation to PCF to change counter names/values, resulting in a change to the QoS setting policy rules for certain active sessions).

Having taken specific action to modify the quality of experience delivered to users to preserve network integrity, those changes can be immediately reflected as appropriate in customer plans.

As an example, if the bandwidth of an FWA service is restricted for more than one hour during an agreed busy period, a reduced per GB rate may be applied to subsequent traffic for an equivalent period of time. Being able to both implement and demonstrate that to end customers dynamically is another key reason for viewing the converged charging system as the key control point for network integrity assurance and commercial plan adjustment and reporting activities.

About MATRXXX Software

MATRXXX Software delivers a dynamic billing, monetization and charging solution proven at scale. Global service providers like Telefónica, IoT providers like Tata Communications and network-as-a-service providers like DISH rely on MATRXXX to overcome the limitations of existing billing applications. MATRXXX provides a unified platform that transforms and simplifies billing operations across consumer, enterprise and wholesale businesses. With MATRXXX, operators can rapidly configure, deploy and monetize personalized offerings, enabling commercial innovation and real-time customer experiences that drive revenue and growth.

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