

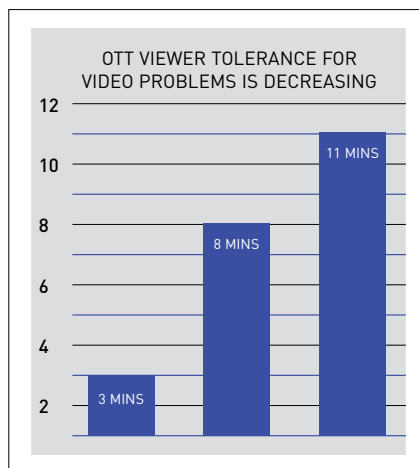
# The new wireless frontier

WiFi is now a top priority for cable operators, both indoors and outdoors, discovers Philip Hunter

**W**ireless and especially WiFi has become high priority for cable operators both inside the home and outdoors, number two only to the latest DOCSIS 3.1 project to deliver gigabit broadband services.

This was acknowledged at the latest meeting of the industry's standards and technology body CableLabs, at which operators identified the two as being inextricably linked, given that consumers now see WiFi as an integral part of their broadband service, or the new 'last mile'.

Already WiFi is the predominant medium for accessing the Internet from portable connected devices such as laptops and tablets, which means that this has become the principle determinant of broadband performance. So one issue for operators is that they are now held responsible by their customers for issues affecting performance or availability via a wireless network over which until now they have usually had little or no direct control for configuration or troubleshooting. With DOCSIS 3.1 set for deployment from 2016 onwards delivering even higher speeds, the pressure on WiFi is only going to increase.



Source Conviva, 2014

The outdoor dimension is almost equally pressing, for WiFi has also emerged as the medium for extending the reach of broadband services and enabling TV Everywhere for existing subscribers. Consumers now expect Internet access from public places via WiFi almost as much as they do at home. Recent consumer research by UK digital terrestrial infrastructure company Arqiva found that 53% of people now deem it critical or highly important to have Internet access outside the home or office. Over 30% of people connect to Wi-Fi at least most times when they are in a pub or airport and 49% when staying overnight in a hotel.

Cable operators can tap into this trend to make their services more attractive to existing customers or 'stickier', while also creating new revenue opportunities, according to Keith Day, Cisco's marketing director for Mobility. "Lighting up malls, transportation corridors, stadiums, downtown areas with WiFi allows cable operators to stay in touch with their customers while they are on the go," says Day. "Adding new personalised location-based services on the WiFi network in these environments is the new revenue opportunity."

A key point is that while smartphones may be used for snacking content on the move, larger devices, primarily tablets and laptops, tend to be preferred for consuming slightly longer form video when people are sitting down in places like airports and coffee shops - and these devices are usually still WiFi-only. "Therefore WiFi was the obvious choice of technology for us to bring connectivity outside the home," says Stijn Eulaerts, product manager, Wifree, of Belgian cable operator Telenet. "It is cost effective, has more supported devices and is very efficient in offering connectivity in high density environments. We therefore deploy our hotspots in locations where customers have nomadic data usage. That means locations where customers sit down or at least spend a few minutes to browse the internet, check social media or consume

entertainment."

Eulaerts emphasises that WiFi was not a substitute for cellular, but a complement to offer higher capacities in locations where

people congregate and spend some time. These are shopping centres, city centres, bars, restaurants and so on. In one Belgian city though, Mechelen, Telenet has gone further by providing full WiFi coverage in the commercial district, as part of a five-year €500 million project called 'De Grote Netwerf in your street'.

Publicly available hotspots also give cable operators the opportunity to exploit their high capacity DOCSIS based infrastructures to offload data from hard pressed cellular backhaul networks. But to exploit this opportunity both parties must ensure that offload works to the benefit of users as well as the respective operators and this means managing the offload process intelligently. Vendors such as Birdstep, based in Stockholm, Sweden, have emerged as specialists in managing the data offload process and more recently combining WiFi and cellular infrastructures to create heterogeneous networks (HetNets) offering the best of both for users while optimising costs for operators.

## HetNets and WiFi/cellular convergence

The first step in combining WiFi with cellular lies in enabling 'zero-touch' user authentication, so that no interaction with the client device is required, also with totally transparent and seamless switching between WiFi and cellular. "We also ensure that every device has continuous real-time knowledge of cellular and WiFi network quality and uses this knowledge for intelligent network selection," says Birdstep CEO Lonnie Schilling. "Furthermore our Device Policy servers enable the cable operator to create very granular policies specifying how the user device will operate, using models combining location, time, network load, QoS, or application based rules. The cable operator can then define how aggressively or conservatively cellular or WiFi is to be used."

This, says Schilling, gives cable operators the chance to partner or lease wholesale cellular capacity from an MNO and provide their cable



VAP3400 - Wireless AC Video Bridge

customers with a cellular service, with absolute control of the HetNet. “It enables them to maximise the customer experience while also saving on cellular wholesale costs.”

HetNets will become more important for cable operators as their mobile reach expands because they will enable them to serve locations beyond the reach of WiFi but within range of cellular networks. Therefore some cable operators are also considering partnerships with MNOs (Mobile Network Operators) to provide near total coverage through HetNets. But for most operators this is some way off, in the distant haze of future 5G mobile services that finally standardise close integration between the licensed spectrum of cellular services and unlicensed spectrum of Wi-Fi.

But the move towards some form of HetNet operation makes immediate sense for quad-play cable operators that already have their own cellular service. In the case of Virgin Media in the UK, now part of the Liberty Global group, the mobile service is virtual, running over EE’s network, but this is incidental to most customers who just want the best connection wherever they are. “As the UK’s first quad-play provider, we consider WiFi from various perspectives, helping our cable customers stay online on the go, and ensuring our mobile customers get the best connection wherever they are,” says Virgin Media’s head of corporate relations, Gareth Mead.

“These different considerations are converging as we and the country move more towards quad-play as standard. We already have services that

run over Wi-Fi for no extra cost, such as Virgin TV Anywhere, the most comprehensive mobile TV service in the country, and SmartCall, which means Virgin home phone inclusive minutes can be used on smartphones,” he says.

As Mead notes, there is increasing overlap between outdoor and indoor Wi-Fi as the two come together in the development of large scale hot spot infrastructures providing extensive coverage, especially in urban areas. The most obvious overlap is through use of Homespot sharing, whereby a subscriber’s WiFi network is securely partitioned such that perhaps other customers of the operator are allowed free access. This can also help improve coverage within a home by recruiting a neighbour’s WiFi network to provide redundancy.

“Using the customer’s WiFi gateway as an additional Hotspot or Homespot is something that is gaining momentum and offers a friendly housing estate service with scope to connect longer and deeper into the garden, providing potential backup in the case of failure of your own device,” agrees Charles Cheevers, CTO at ARRIS.

On a wider note, making the continuity of the mobile/wireless handoff seamless – ie, going back and forth from an LTE network to a WiFi network – is still something that needs to be perfected and implemented in the handset, but there is much work taking place within Cable Labs and other bodies in this area.

### WiFi roaming

When it comes to nationwide outdoor coverage, many cable operators are restricted by their geographical footprint, which often prevents them matching the overall coverage of former incumbent telco competitors with more extensive networks. This is particularly the case in the US where there are several major cable operators and even more minor ones partitioned by geography, so that even the largest, Comcast, only covers a fairly small proportion of public places where people might want access.

The obvious solution was for the operators to club together and allow all subscribers access to all WiFi hotspots and this is what happened when the cable companies created a federated solution where they enable access using the Cable WiFi SSID (Service Set Identifier – the public name of a wireless network) tied to each subscription. “This allows, for example, a Comcast customer who is in a Time Warner Cable area on business



or visiting to use the Cable-WiFi SSID and their Comcast login credentials to access WiFi for free,” says Cheevers. This has now been extended to large parts of Europe as well through a deal between Comcast and Liberty Global, allowing travelers in both regions to access WiFi Hotspots using their home log-in credentials.

Meanwhile, the cable industry is finding ingenious ways of filling in such networks to provide denser coverage, so that subscribers are more likely to be able to access the Internet wherever they are, at least while in more urban areas. ARRIS, for example, has defined what it calls an ‘in between’ device – a DOCSIS and WiFi Hardened Outdoor unit that fits between the HomespotWiFi and carrier level outdoor WiFi gateways.

“This device can typically co-locate with the tap locations in the coax network and cut-in as a dedicated Access Point and backhaul any WiFi traffic directly into the DOCSIS infrastructure,” says Cheevers. “This device increases the WiFi air coverage for an MSO, which can then offer a longer WiFi connected experience.”

Tap locations are in the downstream coaxial part of cable HFC (Hybrid Fibre Coax) networks where amplifiers are located to compensate for attenuation by boosting the RF signals.

So there are a great many use case and opportunities for cable MSOs to make a wireless play both inside and outside the home. And now is the time for them to engage in these. **CSI**