



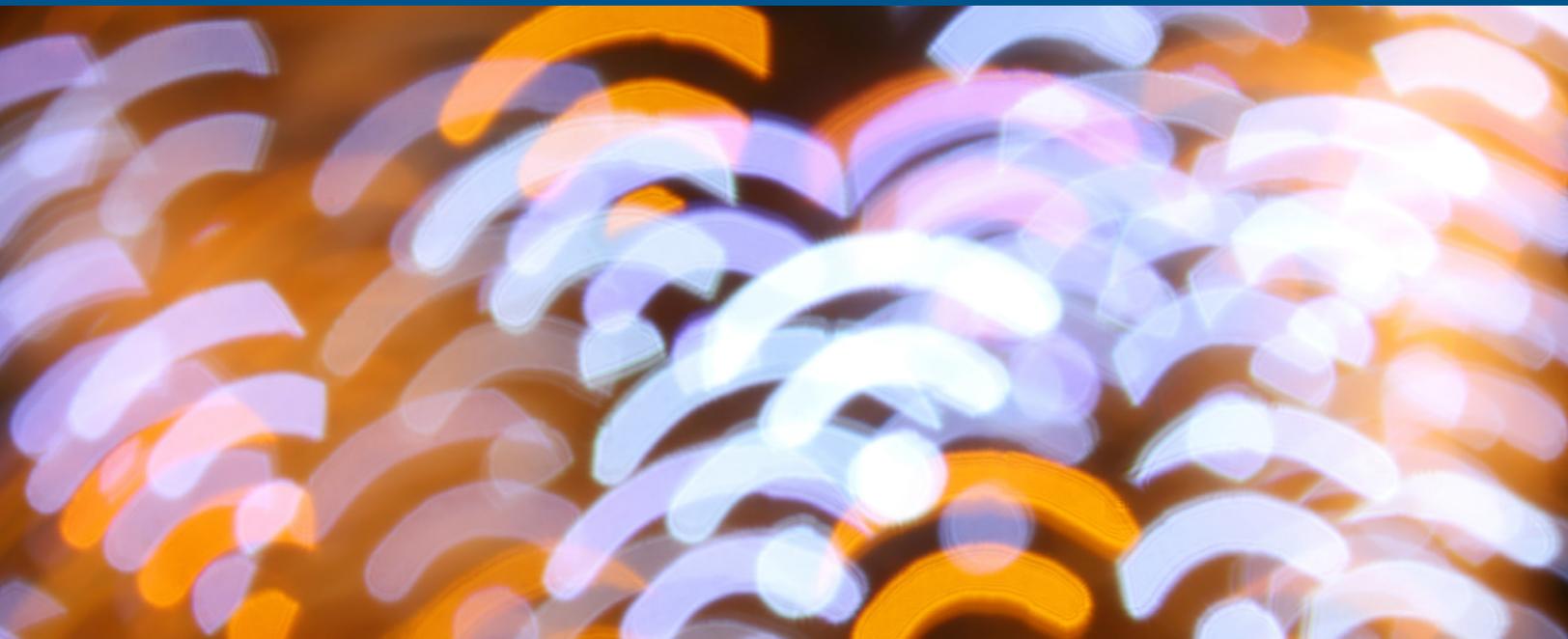
REJUVENATE REVENUES WITH CARRIER WI-FI SERVICES

FIXED AND CABLE OPERATOR CHALLENGES – COMBATING OTT AND MNO THREATS

Mobility and the cloud have fundamentally transformed the communications industry and profoundly impacted fixed-line broadband service providers and cable multiple-system operators (MSOs). The days of high-growth broadband Internet and triple-play services are rapidly fading as cord-cutting consumers increasingly turn to mobile network operators (MNOs) for voice and data services and over-the-top (OTT) providers like Netflix and Amazon for video entertainment services and other value-added applications.

Fixed-line operators risk becoming commodity data providers as OTT providers seize the subscriber relationship and the revenue streams that go with it—advertising, customer analytics and premium services. To make matters worse, OTT providers are making money on the backs of the network operators. Operators are forced to expand network capacity to support skyrocketing IP video traffic growth, but the OTT providers are monetizing their infrastructure investments!

Going forward, fixed-line service providers and cable MSOs must identify innovative ways to win back subscribers and avoid commoditization. Many are turning to carrier Wi-Fi services to extend reach, move up the value chain and restore margin and revenue growth.



CARRIER WI-FI OPPORTUNITY – EXTEND REACH, ADD VALUE, REVIVE GROWTH

We live in a mobile first, cloud-first world. Wi-Fi has emerged as the technology of choice for the mobile era and the Internet of Things. There are **4 billion Wi-Fi devices** in use globally.¹ And 57% of the consumer electronics products purchased around the world are Wi-Fi equipped.¹

Wi-Fi is ubiquitous. It is built into mobile devices like smartphones, tablets and laptops; entertainment platforms like gaming systems, smart televisions and streaming video appliances; and home automation devices like intelligent thermostats, surveillance cameras and control systems. Wi-Fi service is widely available—in homes, hotel rooms, cars, airplanes and public spaces. Almost 60% of U.S. households and over 25% of world-wide households are Wi-Fi-enabled.² And nearly **50 million Wi-Fi hotspots** are deployed across the globe.³

Forward-looking cable MSOs and fixed-line service providers are tapping into the massive Wi-Fi ecosystem, launching carrier Wi-Fi services to stave off competitive threats and rekindle business growth. The Wireless Broadband Alliance [Next-Generation Hotspot](#) (NGH) program and [Wi-Fi Alliance Hotspot 2.0](#) initiative promise to deliver public Wi-Fi experiences that are as seamless and secure as traditional cellular network interactions.

Going forward, community Wi-Fi will become an increasingly viable alternative to cellular in many indoor and outdoor settings. At the same time, MNOs will look to public Wi-Fi to improve indoor coverage, offload radio access network traffic and contain expensive spectrum acquisitions.

Figure 1: Wi-Fi by the Numbers



50 million global Wi-Fi hotspots
4 billion Wi-Fi devices worldwide



42% of the world's mobile data traffic
is carried over Wi-Fi¹



90% of the world's tablet traffic is
carried over Wi-Fi¹



20,000+ Wi-Fi CERTIFIED™ products²

¹ 2014 statistics from [Wi-Fi Alliance](#)

² Wi-Fi Alliance

1 Embedded WLAN (Wi-Fi) CE Devices: Global Market Forecast, Strategy Analytics, February 2014
2 Global Broadband and Wi-Fi Networked Households Forecast, Strategy Analytics, October 2014
3 iPass Maravedis-Rethink Study, November 2014

Most industry analysts believe service providers will be the major builders and operators of next-generation Wi-Fi networks. Carrier Wi-Fi services will enable broadband providers and cable operators to:

- **Establish new revenue streams with Wi-Fi hotspots** – the Wireless Broadband Alliance projects annual global Next-Generation Hotspot service revenues to reach \$150 billion in by 2018.¹
- **Extend service reach with roaming and peering agreements** – allow subscribers to access their home services from any Wi-Fi network, at any time, using any device. Improve customer loyalty and reduce churn.
- **Recoup Wi-Fi infrastructure investments with partner agreements** – generate wholesaling, roaming and offload revenues from other service providers.
- **Expand network coverage and capacity with homespots** – transform residential Wi-Fi gateways into public hotspots.
- **Avoid commoditization with value-added services** – introduce home monitoring and control systems; cloud-based data storage, sharing and backup services; or TV-to-go services.
- **Monetize customer analytics** – sell business intelligence data—location information, TV viewing or Internet surfing data—to marketing firms. Create new revenue streams with location-based services or micro-targeted advertising.
- **Offer managed Wi-Fi services** – implement and operate Wi-Fi networks on behalf of business customers.

1 Cost savings and revenue benefits from Next Generation Hotspot, Senza Fili Consulting, 2013

Comcast and Liberty Global Connect U.S. and European Wi-Fi Networks

Comcast—the largest U.S. cable company—and Liberty Global—the largest international cable company—have teamed up to allow their subscribers to access each other’s Wi-Fi networks. The arrangement gives customers access to millions of Wi-Fi access points in various countries, providing a free alternative to expensive cellular roaming charges when traveling abroad. Comcast has over three million Xfinity WiFi hotspots in the U.S., while Liberty Global has more than 2.5 million Wi-Fi homespots in various European countries.

Source: Comcast and Liberty Global Press Release, September 11, 2014

Leading U.S. Cable Companies Band Together

Bright House Networks, Cox Communications, Optimum, Time Warner Cable and XFINITY have joined together to allow each other’s high-speed Internet customers to access more than 300,000 Wi-Fi hotspots. The [Cable WiFi](#) initiative improves subscriber loyalty by providing consumers a free alternative to cellular data in high-traffic areas like shopping malls, parks, cafes and small businesses.

Carrier Wi-Fi Incremental Revenue Opportunities

Service providers can monetize hotspot investments in a variety of ways, including:

Premium service fees – for bandwidth or QoS commitments

Roaming charges – for subscribers roaming abroad on non-partner networks

Wholesaling settlements – from roaming or offload agreements with other carriers

Managed Wi-Fi services – for hotels, hospitality, retailers, public venues

Flash and pop-up coverage – for sporting events, concerts, political rallies

Ancillary services – including advertising, analytics, value-added applications or sponsored data

NEW CARRIER WI-FI ACCESS GATEWAYS ENABLE CARRIER-GRADE SERVICES

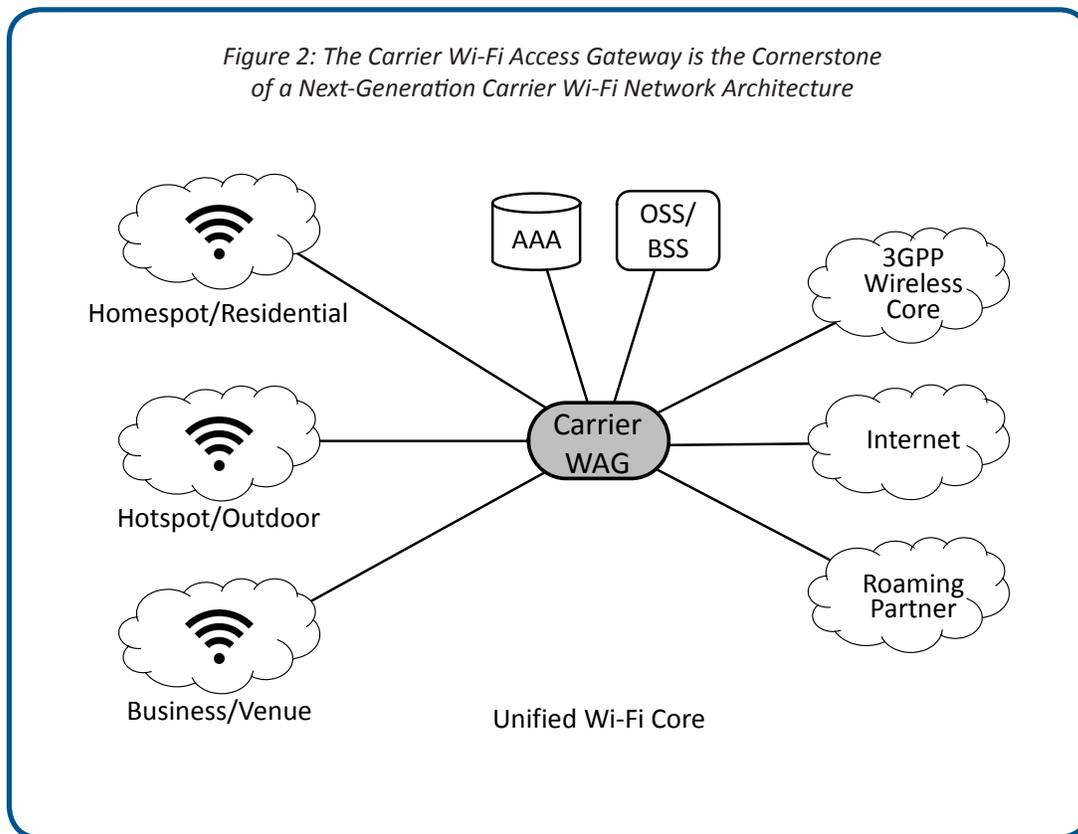
Cable and fixed-line operators are implementing next-generation Wi-Fi-centric networks to capitalize on emerging carrier Wi-Fi market opportunities. A new class of networking solution known as a carrier Wi-Fi access gateway (WAG) serves as the cornerstone of the next-generation Wi-Fi network architecture, providing critical subscriber access and policy control functions. Carrier Wi-Fi access gateways play a central role in ensuring simple, secure and seamless subscriber experiences across endpoints, hotspots and networks.

Conventional wireless LAN gateways, designed for use in enterprise networks, can't meet stringent service provider scalability, availability and security requirements. New carrier Wi-Fi access gateways are specifically designed for next-generation carrier Wi-Fi network deployments. They deliver high performance, strong security, massive scalability and carrier-class reliability and integrate seamlessly with established service provider systems and practices. These gateways also provide IP subscriber management, advanced IP services routing, carrier-grade network address translation (CGN) etc.—all at scale.

Best-of-breed carrier Wi-Fi access gateways support:

- Ultra high-density tunnel termination
- Comprehensive access, authentication and accounting (AAA) capabilities
- Hotspot 2.0 and NGH standards for seamless and secure roaming
- Integration with external policy stores and operations support systems (OSS) and business support systems (BSS)
- Granular quality of service (QoS) controls for differentiated services per device or service group
- Stateful, fully redundant configurations for carrier-class availability

Carrier Wi-Fi access gateways help service providers **accelerate time-to-market** and **contain CAPEX and OPEX** by unifying, consolidating and centralizing Wi-Fi subscriber management functions.



BENU NETWORKS MOBILE EDGE GATEWAY

Benu's Mobile Edge Gateway (MEG) platform is a high-performance Wi-Fi access gateway designed for intelligent service delivery of carrier-grade Wi-Fi to residential, business, venue and outdoor services. The WAG is deployed in the operator edge or core network to aggregate service tunnels from customer premise equipment (CPE) such as cable modems or xDSL modems with integral Wi-Fi access points. Layer 2 tunnels (such as softGRE) are terminated on the WAG, which provides intelligent IP subscriber management and L3 anchoring for all Wi-Fi sessions. The Benu WAG provides a set of carrier-grade integrated IP services for routing, filtering and enforcing service policies at scale.

Leveraging the latest advancements in high-performance silicon technology, the MEG provides software acceleration for Benu's WAG application. The MEG delivers scale and performance for advanced IPv4/IPv6 subscriber management, Wi-Fi mobility including cellular interworking, large scale DHCPv4/v6 server, CGN, service edge routing (OSPF, BGP, IS-IS), access control and filtering policies, and many other features necessary to deliver a carrier-grade Wi-Fi experience and services.

NEXT STEPS

Looking for an innovative way to combat OTT and MNO threats? Move up the value chain, extend service reach, and rejuvenate revenue and margin growth with carrier Wi-Fi services. To learn more about carrier Wi-Fi business opportunities and the advantages and benefits of a carrier Wi-Fi access gateway contact Benu Networks today.



ABOUT BENU NETWORKS

Benu Networks provides operators an evolutionary platform to immediately capture the opportunity to offer consumers carrier-grade Wi-Fi service offerings today, and evolution to virtualization of CPE for subscriber and mobility management, and service delivery while leveraging the latest advancements in SDN and NFV.

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