benu NETWORKS

Rejuvenate Revenue with Carrier Wi-Fi Services

Fixed and Cable Operator Challenges – Combating Over-the-Top and Mobile Network Operator Threats

EXECUTIVE SUMMARY

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, while the OTT providers are monetizing the operator's 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.

## THE CARRIER WI-FI OPPORTUNITY: EXTEND REACH, ADD VALUE, AND 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 (IoT). 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.[2] Wi-Fi is ubiquitous. It is built into mobile devices like smart phones, 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 worldwide households are Wi-Fi-enabled,[3] and nearly 50 million Wi-Fi HotSpots are deployed across the globe.[4]

Forward-looking cable MSOs and fixed-line service providers are tapping into the massive Wi-Fi ecosystem, by launching carrier Wi-Fi services to stave off competitive threats and rekindle business growth. The Wireless Broadband Alliance Next-Generation HotSpot (NGH) program and the 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.

**50 million global Wi-Fi HotSpots
4 billion Wi-Fi devices worldwide**

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

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

20,000+ Wi-Fi CERTIFIED™ products

*Figure 1: Wi-Fi by the Numbers
Source: The Wi-Fi alliance*

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.[5]
- **Extend service reach with roaming and peering agreements:** This allow subscribers to access their home services from any Wi-Fi network, at any time, using any device. It also improves customer loyalty and reduces churn.
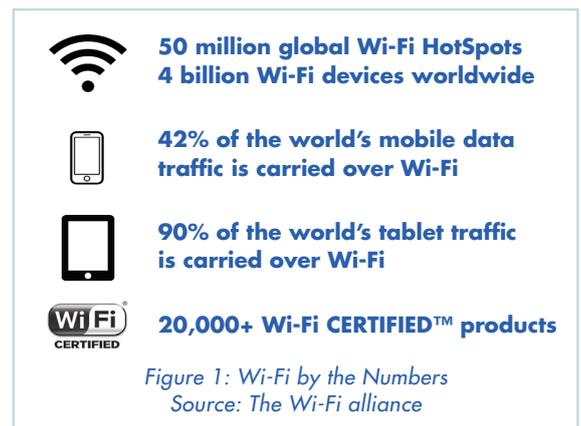
- **Recoup Wi-Fi infrastructure investments with partner agreements:** Generate wholesaling, roaming, and offload revenues from other service providers.
- **Expand network coverage and capacity with HomeSpots:** Transform residential Wi-Fi gateways into public HotSpots.
- **Avoid commoditization with value-added services:** Introduce home monitoring and control systems; cloud-based data storage, sharing, and backup services; and TV-to-go services.
- **Monetize customer analytics:** Sell business intelligence data, such as 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.

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. It provides 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.

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 Wi-Fi 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

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, and public venues
- **Flash and Pop-Up Coverage:** For sporting events, concerts, and political rallies
- **Ancillary Services:** Including advertising, analytics, value-added applications, and sponsored data

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 into 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.
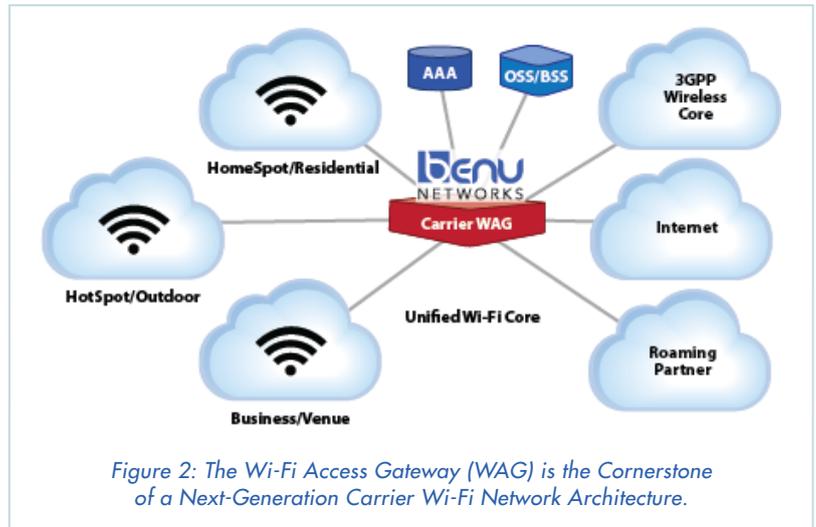
Best-of-Breed Carrier Wi-Fi Access Gateways Support:
- Ultra high-density tunnel termination
- Comprehensive access, authentication, and accounting (AAA) capabilities
- HotSpot 2.0 and NGH standards for seamless and secure roaming
- Integration with external policy stores, operations support systems (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 Networks' 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's edge or core network to aggregate service tunnels from customer premises 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. Benu Networks' WAG provides a set of carrier-grade integrated IP services for routing, filtering, and enforcing service policies at scale.

Figure 2: The Wi-Fi Access Gateway (WAG) is the Cornerstone of a Next-Generation Carrier Wi-Fi Network Architecture.

Leveraging the latest advancements in high-performance silicon technology, the MEG provides software acceleration for Benu Networks' WAG applications. 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.

SUMMARY: ACHIEVE INCREMENTAL REVENUE OPPORTUNITIES

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 of a carrier Wi-Fi access gateway, contact Benu Networks today.

ABOUT BENU NETWORKS

Benu Networks' carrier-class Virtual Service Edge (VSE) software platform enables the rapid creation and delivery of next generation IP services over a converged infrastructure, and empowers service providers to increase revenue, expand market leadership, and meet the dynamic needs of their business, residential and mobile customers.

FOOTNOTES

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*
4. *Cost savings and revenue benefits from Next Generation HotSpot, Senza Fili Consulting, 2013*
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