



vWLAN Mobile Data Offload

Carrier-Class Wi-Fi to Ensure Mobile Data Profitability

Bluesocket vWLAN Advantages

- **Cloud-Based Control:** Distributed data plane and centralized control plane allows for thousands of Access Points (APs) to be managed by a single software-based controller
- **High Availability:** Geographically separated controllers that offer zero packet loss during controller failover
- **Single Solution for Multiple Services:** Hosted/managed enterprise Wi-Fi, mobile offload, smart metering and other Wi-Fi enabled services from a single architecture
- **Seamless Roaming across Layer 2 or Layer 3**
- **EAP-SIM/AKA with Integrated AAA Support:** Ability for APs to communicate directly with AAA systems for user authentication

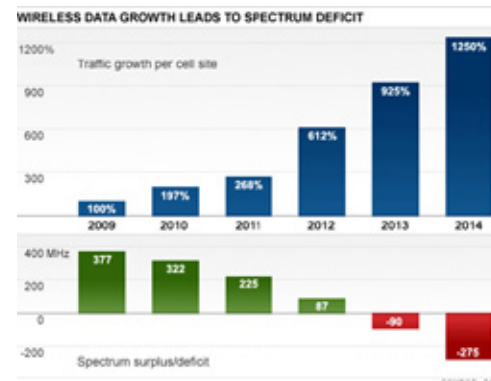
ADTRAN Carrier Wi-Fi Backhaul Advantages

- **Carrier Grade Ethernet service delivery** for high bandwidth backhaul with optional powering over bonded copper pairs to outdoor access points
- **Integrated SLA Management:** Extensive OAM feature set with integrated Y.1731 SLA monitoring of both wireline and wireless systems
- **Service Oriented Management System:** OSS support to enable seamless integration into the existing infrastructure

Soaring Demand with Eroding Profitability

The number of wireless subscribers accessing mobile data services continues to increase rapidly year over year, as a result mobile data traffic is now estimated to grow 26-fold by 2015. However operators' revenue per Gigabyte (GB) of data has been steadily decreasing much quicker than the cost to deliver the data service using the traditional cellular Radio Access Network (RAN) infrastructure.

According to a new 2012 study by wireless analyst Chetan Sharma, for the four nationwide mobile operator networks in the U.S., data represented 85% of mobile traffic. However that data only accounted for 39% of



all mobile data revenues carriers collected in the fourth quarter of 2011. Recognizing that data delivery via a cellular model will only continue the decline of profitability, operators are compelled to pursue alternative, low cost technologies to deliver data services. Today, mobile data offload strategies have quickly become an urgent initiative in every operator's business plan.

Wi-Fi is the Answer

Wi-Fi networks can easily complement cellular networks, enabling operators to offload their highly congested cellular networks. Wi-Fi

technology provides an inexpensive method for delivering data services. Operators can utilize a Wi-Fi network to reduce traffic congestion on the main network and to cost-effectively increase network capacity at specific locations. Wireline and cable providers can also use Wi-Fi networks to provide offload services and create new revenue streams by offering new applications.

Bringing the Power of Virtualization to Wi-Fi

ADTRAN's virtual Wireless LAN (vWLAN) solution brings the power of virtualization to Wi-Fi networks. The vWLAN solution virtualizes Wi-Fi network control and management onto software which runs on a hypervisor (e.g. VMware®) or a virtual appliance.

Within a traditional wireless LAN, legacy hardware controllers have complexities and scale limitations – the method of scaling has been to add more and more costly hardware controllers. vWLAN eliminates the need, cost, and all the operational constraints inherent to hardware controllers – resulting in significant cost savings in CAPEX, OPEX, and Total Cost of Ownership (TCO).

ADTRAN's vWLAN Wi-Fi Offload Solution

ADTRAN's vWLAN Wi-Fi Offload solution provides a virtualized, carrier-grade architecture that complements existing fixed and mobile core networks. Implementation of the solution is seamless to both the subscriber and the mobile core, ensuring no disruption of service and an uncomplicated, rapid deployment.

ADTRAN's vWLAN Wi-Fi Offload solution offers operators a seamless extension of their 3G and 4G networks that is easy and economical to implement and maintain. vWLAN enables operators to increase their network capacity immediately at minimal cost while providing the operator with complete control and





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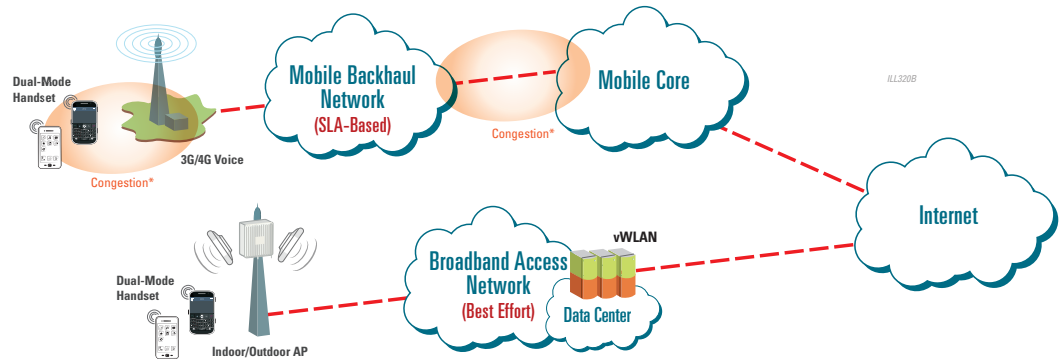


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*Mobile Offload via Wi-Fi Addresses Two Key Areas of Mobile Broadband Congestion: RAN Congestion and Backhaul Congestion

management of the Wi-Fi offload network. Since the mobile data traffic that is offloaded to the Wi-Fi network never routes through the local cellular towers or into the operator's mobile switching center (MSC), the vWLAN Wi-Fi Offload solution frees up costly cellular assets to be better utilized wherever the operator sees fit.

Seamless User Experience

The vWLAN Offload solution employs the same subscriber authentication as the cellular mobile core. A connection manager on the subscriber's phone is set to automatically detect and select a Wi-Fi network without user intervention.

Supporting the same 3G/4G policy and charging functions, the Wi-Fi services are defined and managed exactly as if they were actual 3G/4G services on the cellular network. The vWLAN Offload solution uses the same security policies as the 3G/4G cellular network and leverages the existing Diameter PCRF/OCS/OFCS interfaces for authentication, policy control, charging control, and roaming.

Cellular Friendly Hotspots

Since Wi-Fi is unlicensed spectrum, there was little consistency across the varied hot spot population and a complete lack of integration between cellular and Wi-Fi networks.

The rapid and widespread proliferation of Wi-Fi-enabled devices along with the growth of hotspot traffic became the drivers for change. According to the Wireless Broadband Alliance, figures for 2011 put the total number of Wi-Fi hotspots worldwide at 1.3 million. That number is forecasted to take a huge leap forward and grow 350% to 5.8 million by 2015.

Hotspot 2.0 (HS 2.0), developed by the Wi-Fi Alliance and the Wireless Broadband Association, is a Wi-Fi certification program to ensure that Wi-Fi devices can easily connect to hotspots in a security-protected, interoperable way. Hotspot 2.0 includes defined technology and certification requirements for Wi-Fi infrastructure devices and endpoints such as handsets, tablets and notebooks.

Hotspot 2.0 allows for seamless and secure roaming between 3G/4G cellular networks and Wi-Fi networks. Seamless to the user, it is as simple and secure as roaming between cellular towers.

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