Extricom

Using Extricom WLAN To Offload Cellular Data

In the nearly three years since introduction of smartphones, wireless operators are feeling the effects of the wireless usage data increase. On a global basis, mobile data traffic doubles every year, with both business and consumer mobile IP traffic impacted by adoption of smartphones and other portable devices. To give an idea of the scale of this issue, UK-based service provider reported that its mobile data traffic in Europe doubled every three months in 2009 and a US based service provider has indicated that its mobile traffic increased 5000% in the past 3 years.

New generations of wireless devices like netbooks and the iPad supporting exponentially increasing numbers of web applications will feed into the voracious appetite for bandwidth. Experts estimate that smartphones will consume 10X the bandwidth and laptops 1000X the bandwidth of a regular cell phone.

This presents an enormous challenge, especially in user-dense environments like shopping malls, hotels, hospitals, and campuses. Capacity demand is outstripping bandwidth supply in many urban markets, so leading operators are looking for ways to ease coverage and congestion pains. Some possible approaches are:

Optimization: Implement traffic management tools in the core - Isolating heavy data users requires intensive packet inspection and correlation. This has a performance and cost overhead.

Scale: Accelerated LTE deployments – While LTE offers significant throughput advantages over current 3G technologies, the current rate of data demand promises to far outpace any increased supply enabled by tower or rooftop based 4G deployments

Increase the bandwidth of backhaul links – With a high cost per MB, this approach provides a broader delivery pipe. But the main user segment only gets a fractional benefit as the major consumers will continue to consume the increased bandwidth.

Wireless operators are feeling the effects of the wireless usage data increase from smartphones and other portable devices. Optimizing or scaling the network only delays the inevitable capacity crunch – a better solution is to get rid of the underlying cause by offloading traffic completely to an adjunct network.

The Solution: Offload to WLAN

Optimizing or scaling the network only delays the inevitable capacity crunch – a better solution is to get rid of the underlying cause by offloading traffic completely to an adjunct network. Moving the traffic of a heavy-bandwidth–consuming user to an alternate overlay network will ensure stable bandwidth for other network users. Alternatively, a user competing for bandwidth on a loaded network can jump over to the less-heavily used network.

The adjuncts to the main cellular network can either operate independently or as an overlay. Two possible solutions include:

Femtocells – The advantage of Femtocells is that they leverage licensed spectrum, offer better indoor coverage at lower power, and work with common single-radio handsets. To date, however, they have yet not reached widespread availability.

802.11 Wi-Fi – A considerable advantage of Wi-Fi is that it's already widely deployed. All laptops now include preinstalled Wi-Fi, and most new Smartphones have it as well. Smartphone users are already accustomed to accessing Wi-Fi networks. In addition, recent advances in the Wi-Fi standard make it much more suitable for mobile operators. 802.11n can transmit over longer distances at faster speeds, and its multiple radio technology enables better signal propagation and more consistent coverage.

Up until now, mobile operators might have viewed Wi-Fi in terms of disparate unmanaged hotspots, but large-scale deployments have proven that Wi-Fi networks consisting thousands of access points can be effectively and centrally managed. These large Wi-Fi networks have also proven the viability of both transparent authentication and mobility for Wi-Fi. Wi-Fi has also benefited from continued innovation, including lower battery consumption and better integration of connection management through auto-connectivity features.

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Industry Brief-Cellular Provider

Value:

Impressive Performance

Surprising Simplicity

Lowest Cost of Ownership

Features:

Simpler Design and Maintenance

Robust Wireless Connectivity

Seamless Mobility

Designed for 802.11n

TrueReuse™ Bandwidth

Multi-Blanket Operation, in One Infrastructure

Providing Wi-Fi as an integrated and managed service is only possible if the service provider can exercise control over it. More specifically, this means controlling the alternate network operating in unlicensed spectrum and effectively monetizing it in operator-owned coverage zones. Some critical criteria include:

Enabling seamless authentication

Enabling Mobility – seamless transition between Wi-Fi nodes

Service Integration: Enabling transparent access without regard to the underlying radio network.

The Speed Factor

Operating in 802.11g, Wi-Fi can provide 15 times the capacity of HSPA and in 802.11n up to 20 times the capacity promised by LTE. For example, at a distance of about 300 meters, an 802.11n Wi-Fi device can transmit signals at 15 Mbps. This is compared with about 5 Mbps using the older 802.11g Wi-Fi standard. This is in comparison to the average 400-700 Kbps speed of 3G wireless and the average downloads of around 1-2 Mbps of 4G.

Requirement	Extricom Unique Value
Deployment flexibility	• No RF cellular planning phase, no co-channel interference • Architecture supports dense AP deployment to ensure coverage • Edge switch requires single LAN port to overlay its connected APs • Power supplied to APs via PoE from the switch • No Layer 3 tunneling or VLAN configuration required to the wired network
Mobility	• The Extricom architecture uses a single BSS (Channel Blanket) to cover large areas, translating to zero client handoff between cells while roaming.
Capacity	• Extricom APs are equipped with up to 4 radios that can operate simultaneously. • System provides inherent RF spectrum efficiency as all channels can be used everywhere thanks to patented Same Band technology. • No ‘rate versus range’ compromise: APs can be densely deployed, ensuring data rate guarantees without coverage holes.
Quality of Service	• Multi-layer WLAN allows for separating applications, ensuring QoS and enabling mobile operators to support separate and distinct service offerings in a single infrastructure, such as voice and data • Ability to separate 802.11a/b/g/n onto dedicated layers ensures there is no “mixed mode” penalty and lowered aggregated bandwidth • Multiple BSSIDs - Separate encryption and authentication is supported for each SSID, as well as priority levels • Load-balance capabilities based on real-time decision making
Network Resilience	• Uplink/downlink diversity ensures robust connectivity • AP overlap and edges switch redundancy ensures against complete system failure.

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Wireless that Works