

7/7/2010



HARISHVADADA.WORDPRESS.COM

LTE & WiMAX BLOG

5 reasons why WiMAX will be a Niche Technology | hvadada



5 Reasons why WiMAX will always be a Niche Technology

WiMAX on the very onset had a great time to market advantage for bringing in an All-IP network along with TDD advantages that started the race for 4G supremacy. But somewhere along the line 3GPP caught up with the onset of LTE specs development and has commitments from more than 88 operators across the world and an ecosystem was born. The other day while watching TV, I had an analogy – Larry King had just announced his retirement from CNN and he was speaking with Bill Maher, and when asked of his successor, he mused maybe Ryan Seacrest. That is when it struck me WiMAX is like Bill Maher – a great guy but his place is on HBO not mainstream CNN, and Ryan Seacrest is like LTE, effervescent and very mainstream.

This reminds me of the other wireless battles in the past the CDMA vs. GSM, which complemented each other and help make the user experience better. The battle is never about which technology is better, as both have their own advantages and disadvantages, but about the adaptation by the suppliers and the media. Most technologies adaptations are based on various factors like spectrum policy, economic considerations, supplier ecosystem, media and target market segment.

Here are five factors that have had an impact on the WiMAX ecosystem.

Economic Downturn impact:

The impact of the market crash in 2009 has had far reaching implications to all industries especially the discretionary spending budgets of the Telco's to upgrade their networks. Many of the far reaching network augments and technology upgrades for traditional Telco's as well as wireless providers were dictated by the economic factors. 2009 was a disastrous a year as it seemed at the outset, starting as it did with the catastrophe and bailouts for the financial industry, real estate, and the auto industry. And this not surprisingly has impacted the growth of WiMAX putting pressure on Greenfield operators. Several suppliers reported that a bottom had been reached and expected an upturn in business – modest or otherwise – going forward.

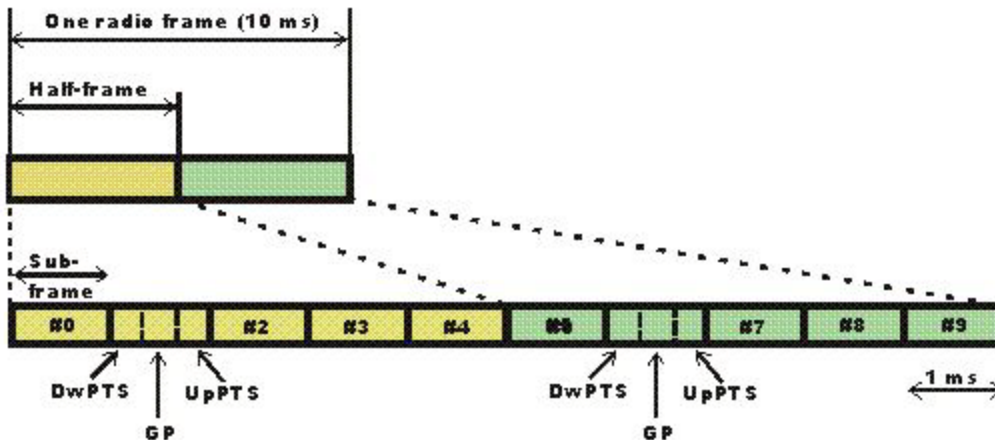
One of the biggest trend that developed over the last couple of years was the level of consolidation at the infrastructure layer; with several large RAN players either having exited the space or merged with other players over the last year. Nortel was divvied up and assets scooped up by other infrastructure vendors, Navini became Cisco to be shut down completely later, Starent was also bought over by Cisco, Wichorus was taken over by Tellabs, etc. One of the strong transformations under way in the telecom sector is the way large telecom equipment players are becoming Managed Services players (such as Ericsson, ALU and NSN); with an increasing part of their revenues coming from services business versus hardware / equipment sales.

Industry Trends:

- Corporate moves to control spending did not stall shifts to greater use of communications.
- Flat and pre-pay plans gained increased market share during 2009. While this put downward pressure on ARPUs and margins, the industry was bolstered by the complimentary rise in 3G/HSPA+ broadband.
- Government initiatives for broadband infrastructure and service development have gone forward in the US, China and Brazil.
- Operators stressed applications and a unified web-enabled experience more than ever before. The usage model has experienced a dramatic shift, which is evident in the rising market shares of Apple iPhone, Samsung, RIM and other web-device competitors. Google Android has made significant inroads.

- Underserved markets including Russia, Malaysia, and the African continent saw robust growth. A few markets such as India continued to see delays in spectrum auctions and deployments due to economic outlook.
- As expected, several operators have nudged out their earlier forecasts for commercial availability of LTE service into late 2010 or early 2011. Some operators announced they would upgrade to HSPA and HSPA+.

LTE and its variant of TD-LTE:



There are two versions of LTE. FDD-LTE uses the FDD paired spectrum with two separated channels, one for the uplink and one for the downlink, which is the type of spectrum most mobile operators have. TD-LTE uses TDD unpaired spectrum channels that combine uplink and downlink, and split resources on the basis of real-time demand. Voice is inherently symmetric in the uplink and downlink so it is well suited for FDD spectrum allocations. Data traffic benefits from TDD spectrum, as it is typically asymmetric but the degree of uplink/downlink asymmetry is not fixed. The development of TD-LTE was initially pushed by China Mobile and regarded as a mainly Chinese standard, similarly to TD-SCDMA.

The appeal of TD-LTE has widened well beyond China. The recent announcement of Qualcomm to bid for TDD spectrum in India to support a TD-LTE deployment confirms—although it was not required to validate—the emergence of TD-LTE as global technology, likely to command a substantial market share.

The FDD LTE and TD-LTE versions of the 3GPP standard are very similar. As a result, devices can support both the FDD and TDD interfaces through a single chipset—i.e., without any additional cost. This is a hugely important new development: TD-LTE will benefit from the wide availability of FDD LTE devices that will be able to support TD-LTE as well. Unlike WiMAX, TD-LTE does not need to prove to have a substantial market share to convince vendors to develop devices. Vendors do not need to develop new devices, they simply need to add TD-LTE support to the existing ones.

There is a lot of TDD spectrum available, and in most cases it is cheaper and under-utilized. 3G licenses frequently have TDD allocations and upcoming 2.5 GHz auction in most cases contemplate TDD bands.

The increasing availability of base stations that can be cost-effectively upgraded will make it possible and relatively inexpensive for WiMAX operators to transition to TD-LTE using the same spectrum allocation. The transition will still require substantial efforts and be justified only in some cases, but it will make it easier for WiMAX operators to have roaming deals and to have access to the same devices that LTE operators have.

WiMAX operators will also be barely affected by TD-LTE in the short term. WiMAX is years ahead in terms of technological maturity, devices and ecosystem. This gives them a strong advantage in comparison to TD-LTE operators: They know the technology already, they have a network, and they have customers. They also have the choice whether to switch to TD-LTE or not—and, more importantly, they have no pressure to do so before TD-LTE has reached the maturity they feel comfortable with or until the WiMAX 16m prospects become clearer. WiMAX is losing the battle, but winning the war. WiMAX operators are increasingly keen on requiring vendors to be able to support both a transition to WiMAX 16m and to TD-LTE as smooth as possible.

That is the rule of evolution – big fish eat small fish!

IEEE VS 3GPP:

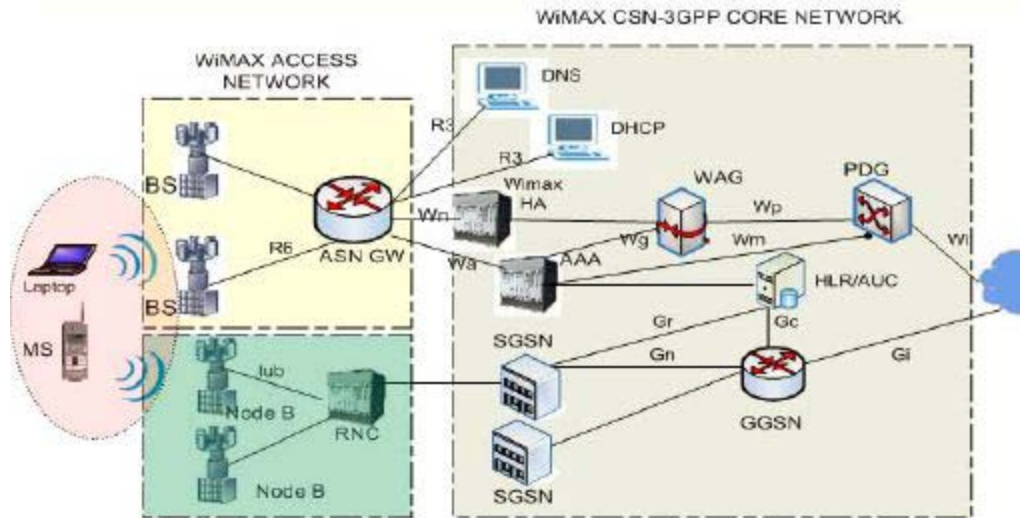
LTE development has been driven by operators; this type of initiative is one of the key differences between LTE and its predecessors, which were primarily vendor-driven technologies. Several operators (Sprint Nextel, China Mobile, Vodafone, Orange, T-Mobile International, KPN Mobile, and NTT DoCoMo) formed a limited liability company called Next Generation Mobile Networks (NGMN) Ltd in September 2006. Subsequently, NGMN defined the high-level requirements for all next-generation broadband wireless networks – not just LTE. 3GPP works very closely with NGMN to define the scope of work and the charter for LTE and LTE-Advanced.

In addition, the LTE/SAE (Service Architecture Evolution) Trial Initiative (LSTI) was formed through the cooperation of vendors and operators to begin testing LTE early in the development process. NGMN defines the requirements and LSTI conducts testing to ensure conformance. The 2008 Mobile World Congress was seen as a turning point for LTE. This conference showcased the increased momentum in LTE development and support from both the device and infrastructure perspective. Vendors showcased advanced LTE devices and infrastructure while operators announced their LTE strategies or trial plans.

WiMAX is an offshoot of IEEE wireless standards including 802.11, 802.16, 802.20, and 802.22 starting out with the view that the complex task of designing wireless networks must be chunked down into discrete task groups and purpose designed standards. These tasks are given mandates to fulfill specific functions and then work to collaborate across lines of development. This has been necessary because IEEE is open to all, and thus must build a consensus among many participants from around the globe who may have different orientations. However, this approach led to islands of development and commercial momentum that are less organized and strategic than the well-situated UMTS/LTE industry approach. The WiMAX effort has been embryonic – although developing a competitive supply ecosystem, WiMAX has not yet had the scale to play the role of market assimilator similar to UMTS.

The WiMAX Forum might have jumped forward in their thinking to the situation the industry faces today: it still faces the catch-22 of building commercial momentum while needing huge amounts of capital to acquire spectrum and fund large-scale deployments to compete with the mobile industry. Proponents of 3GPP LTE point to the large volumes their industry will develop that are expected to lead to lower cost per unit and operation efficiencies.

Backward compatibility with 3GPP and Roaming:



The first challenge for WiMAX roaming is interoperability. WiMAX is deployed in specific markets and is concentrated in urban areas in the US. In order for users to access WiMAX services outside of their operator's WiMAX network coverage area, devices must be interoperable across other WiMAX networks and between various vendors' equipment. But the ecosystem is yet to be delivered, as Sprint just came out with the HTC EVO last month.

The second challenge for WiMAX roaming is that of multiple WiMAX air interface profiles. Operators do not necessarily have the same frequency bands available within their respective geographic regions. Depending on the country, carriers may use different radio bands for their WiMAX networks, such as 2.5 GHz or 3.5 GHz, and client devices may be equipped to use only one of these. The WiMAX industry is in need of devices that support multiple bands. This was a challenge for previous generations of technologies as well, and was addressed by the availability of dual band, tri band and quad band devices. The same is expected to happen within the WiMAX space to address frequency challenges.

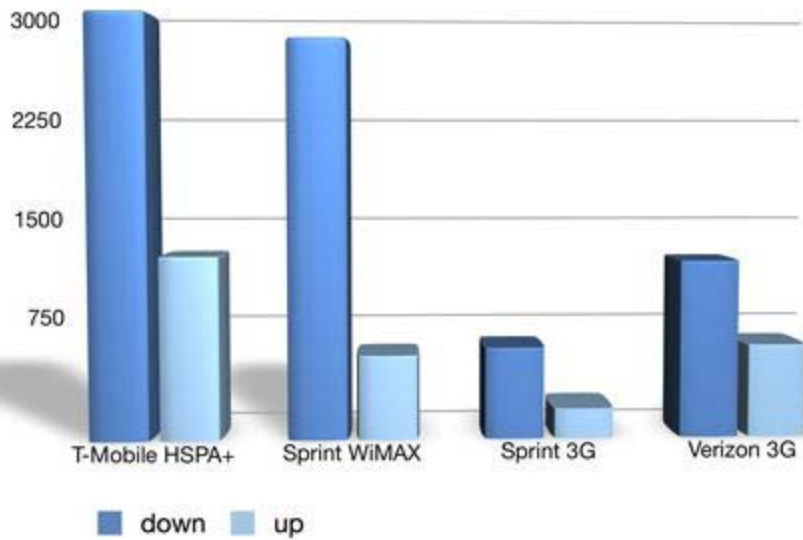
Meanwhile LTE doesn't face a situation like this as the critical factor in 4G success will spill over from 3.5G – having the hottest hand-held devices. Suppliers will dance to the tune of the largest operators with the most significant coverage.

HSPA+:

HSPA+ is aimed at extending operators' investment in 3G/HSPA networks and easing migration to LTE. HSPA+ with 2x2 MIMO, 64 Quadrature Amplitude Modulation (QAM) in the downlink, and 16 QAM in the uplink will increase data rates up to 42 MB in the downlink and 11.5 MB in the uplink. In addition, the one-tunnel architecture flattens the network by enabling a direct transport path for user data between the Radio Network Controller (RNC) and the GGSN. Control data will still use the SGSN. There is also an option to integrate the RNC directly into the eNodeB, thereby eliminating the need for separate hardware. These additional capabilities address the need for augmented bandwidth, reduced latency, and network elements with the same 5 MHz channel bandwidth used in UMTS networks. Consequently, operators can leverage existing 3G spectrum to deploy HSPA+. In addition, this architecture supports enhanced VoIP services. As a result of these enhancements, the need to upgrade to LTE is not as compelling. Operators feel that 42 MB will meet their data requirements for the next several years. The only drawback is that HSPA+ is still a CDMA-based technology and will lack the increased efficiency of OFDM (orthogonal frequency-division multiplexing).

Here is a HSPA+ Vs WiMAX study by Rich Brome from Phonscoop.com

A test was run on the T-Mobile HSPA+ network and the Sprint 4G (Clearwire) network, across six locations in Philadelphia, and an average user experience was calculated.



- Both were considerably faster than CDMA EVDO Rev. A
- HSPA 7.2 devices deliver surprisingly fast data on T-Mobile's upgraded network
- T-Mobile's HSPA+ is more than twice as fast as WiMAX
- Latency test – T-Mobile's HSPA+ was, better with a difference was one-tenth of a second
- Sprint about their WiMAX network is that parts of their Philadelphia network are already at capacity, meaning the network is "full" with existing users and, essentially, maxed out. Just as Sprint is still building its WiMAX network city-by-city, T-Mobile is still in the process of upgrading its network to HSPA+, also city-by-city. Once a city has been upgraded, T-Mobile's HSPA+ coverage is the same as their existing 3G network coverage, since it's the same network, just upgraded. T-Mobile's upgraded HSPA+ network is worth a hard look.

** This comparison has its drawbacks, as Sprint network is loaded with 4G devices, whereas T-Mobile doesn't have any HSPA+ capable phones. Also Sprint uses the Clearwire network as a direct tunnel, which impacts the latency of the network.

Conclusion

WiMAX is truly at a turning point today. Its time to market advantage is being offset by the incredible dynamism of the LTE community and the scale that it has achieved in record time. Cost advantage is the last piece holding the machine together. Although wireless is a market rich in niches, the possible survival of a defeated standard could be very much defined by its cost. After the successive salves of operators' announcements about their selection of LTE, the question of the survival of WiMAX is completely relevant. Many in the industry are now thinking that WiMAX may eventually disappear altogether, or else remain restricted to a small niche.

With the significant momentum that LTE is gaining, the battle could be well over if WiMAX can't retain the cost advantage despite its lack of scale. WiMAX market dynamics could help overpass the scale limitation and help bail the standard out. WiMAX's ability to compete in terms of cost may define its future and eventually ensure that WiMAX could still be an option for service operators in some emerging markets, for vertical applications and other niches.