

WiMAX Forum Certified™ Expansion

Ed Agis, Chairman of the WiMAX Forum Certification Working Group (CWG), talks to InterComms about development with the WiMAX Forum specifications



Mr. Ed Agis is a Market Development Manager for the Mobility Wireless Standards and Technology Division of Intel. He is the Senior Chair of the WiMAX Forum Certification Working Group and a member of the WiMAX Technical and Marketing Working Groups. He is actively involved in the IEEE 802.16 standards body and responsible for the development of the certification testing infrastructure of the WiMAX Forum. Mr. Agis is also the WiMAX Forum Liaison to the European Telecommunications Standards Institute (ETSI).

Prior to joining the Wireless Standards and Technology Group, Ed was assigned to the Wireless Product Division (WPD) responsible for marketing programs strategy and development for the Intel wireless networking planning strategy.

Mr. Agis joined Intel in January of 2001. Prior to his current position,

Mr. Agis was the Director of Marketing and Business Unit Manager for Access Products at Xircom leading the launch of numerous mobile access products. Before joining Intel, Mr. Agis also worked for Texas Instruments as the WW Product Marketing Manager for Advance Systems Solutions and PCI Bus Products. During his tenure at Texas Instruments, Mr. Agis led the launch and market development of TI's PC Card Controller, PCI Bridge Chips and Low Voltage Logic Chips

Mr. Agis holds a Bachelors of Science Degree from the Air Force Academy, graduating Magna cum Laude in 1976 as well as a Masters of Business Administration in Management and another in Operations/Product Marketing from USC/Amber University.

Q: What is happening in terms of progress with additional frequencies with WiMAX specification?

A: The working groups in the Forum provide inputs into the Technical Working Group as well as the Regulatory Working Group. In that process we put together a document that contains a list of eligible certification profiles. A certification profile is the RF band, the channel bandwidth or raster and duplex mode. Then, the CWG, undertakes a periodic survey, about once every six months to see where the vendors are in terms of building products and those that are ready to support validation. What is interesting is that we have already introduced certified devices in 2.5GHz at 5MHz and 10MHz. And at 3.5GHz we

have three profiles at 5, 7 and 10 MHz. What has happened just recently is that the CWG has made a recommendation to the WiMAX Forum board of directors to begin validation activities in October of this year for the next set of profiles in 2.3GHz at 5, 8.75 and 10MHz. When you look at that from a global roaming perspective, you can now start building dual or tri-band devices and the stage has been set in terms of a certification profile for global roaming. A device could effectively be roaming from one profile to another. The other aspect of roaming of course is that you have different countries that are using the same profile. What would happen is very similar to what happens in today's cellular world where the operators would have roaming agreements. For example I would be on a Clearwire network in the US and when I go to Japan, because Japan is introducing 2.5GHz at 10MHz, operators could set up a roaming agreements with operators in Japan, so that I can use the same WiMAX device there.

Q: How is the certification testing programme going?

A: In terms of the certification program, we have a pretty good, robust suite of test protocols, based on standard IEEE interoperability testing, using a series of tests developed over the years and from our experience with 802.16d. We have added additional tests which look at different configurations or set ups in terms of interoperability. In, the interoperability scenarios you will typically have multiple

► subscriber stations with operators using at least two base station vendors. Operators will typically buy or lease from two base station vendors across their networks. In our Mobile Interoperability Test (MIOT) testing, for a base station to pass certification testing for interoperability it has to work with minimum of three mobile subscriber stations and if it is a mobile subscriber station, it must interoperate with minimum of two different base station vendors. That suite of testing is in place and we continue to add additional tests for Protocol Conformance Test (PCT), Radio Conformance Test (RCT) and even MIOT because there are other features that we will turn on over time as the vendors become ready. There is some additional testing beyond these modules that includes what we call Network Conformance Testing (NCT), which will be introduced in mid-2009. The reason that NCT is important is that this is testing is conducted on the mobile terminals themselves. That sets the stage along with other test suite modules for when we start introducing products in the retail space. As an example, if you were to go off and buy a device from a virtual warehouse, when those devices are ultimately introduced, they will have gone through what we call Retail Enablement, which includes network conformance testing in addition to the other modules of testing including Radiated Performance Testing. That is another suite or module of tests that are applied to the terminals not base stations. It has to do with receiver sensitivity and transmit performance, which looks at the radiated overall performance of the device/mobile station. Today, when you buy a cell phone, it has already gone through such testing. Our WiMAX devices will also go through the same performance testing. Right now we are doing certification that is based on PCT, RCT and MIOT. You are going to see additional test modules introduced for certification testing and then you will see another phase which actually enables the product to be sold to the retail channel.

Q: What happens to WiMAX over the near future?

A: For 2010/2011, the 802.16e 2005 IEEE standard, which is now at Rev 2 is now officially in Letter Ballot. That is the final stage that the standard goes through after all the latest changes have been discussed,

resolved and harmonised amongst the members. The WiMAX Forum takes that very seriously because many of our members are actual members of the IEEE and have assisted in providing individual contributions to the standard. That is going to trigger off another set of activities in the sense that will have us do additional enhancements in terms of the PCT testing. It will also include the introduction of a duplex mode Frequency Division Duplex for Mobile WiMAX all the prior profiles are Time Division Duplex. In addition to those enhancements, we will have to go back and revalidate some of the tests that we currently have in the suite because they will be affected in some form or fashion by some of the changes that are being introduced in 802.16e 2005 Rev 2.

Q: What about 802.16m?

A: That is the next stage after the 802.16e 2005 Rev 2. Some of us in the Forum call that Release 2. The Rev 2 that I mentioned is Release 1.5. I would anticipate that the IEEE will complete their work on Release 2 sometime around mid 2010/2011. Then it will go through the Sponsor Ballot, then the Letter Ballot. As we get closer, eventually what happens is that one of our Work Groups starts a Systems Profile Document. That document then pulls from the standard those things that we believe are a necessity for use in Mobile WiMAX. It identifies the band, the power class and features that we have to have as mandatory and it identifies features that are options. This effort kicks off another series of developments for specification of the documents that the CWG ultimately uses to create the Test cases. Thereafter we start getting into validation and we reload the cycle with new certification profiles, which will be based on the 802.16m timescale. That activity will start out about mid year 2010 after 802.16e is closed. It will probably take about a year as we progress with other specifications.

Q: What are the other specifications?

A: In between the 802.16e 2005 rev 2 and the 802.16m, we have another major introduction in regards to the development of testing and specification in the WiMAX Forum. That is referred to as Network Interoperability Testing or NWIOT. That module is based on a specification by our Networking Group. These are guys that come from the 3GPP world who

have been involved with the development of other cellular technologies. What no one else has been able to do is introduce the capability to test what we call reference nodes in a network. The WiMAX Forum is going to introduce a test bed which is able to switch out base stations, gateways, home agents and all the different components. The testing requires that we test the terminal and the base station, the base station and the ASN Gateway and the ASN gateway and the AAA service across reference nodes. In addition to all that we are also the only industry consortium today that also certifies base station. Nobody else does that.

Q: Is the capacity in your certification labs keeping pace with demand?

A: Our capacity is ahead of the pipeline. We need to do that so we can assure vendors who are coming in for certification testing that they can go to any of our global labs because they each have the same test capability, whether that is China, Korea, Taiwan, the US or Europe. There will probably also be another lab in Brazil and in Malaysia. In terms of the actual pipeline, what we are seeing initially you see it is sort of like an ice hockey stick, where you see small number of devices come in but after that it starts to pick up. We are seeing the introduction of certified chipsets and modules which will go into other OEM products. Today you will see up on the WiMAX registry, about 70 plus devices that have been WiMAX Forum Certified for Mobile WiMAX and there will definitely be more. You will also see over time the introduction of many device form factors: handsets, notebooks, netbooks, mobile internet devices, hand held devices, cameras and gaming devices. When those particular vendors choose to submit is determined by them and their market requirements. There are well over 455 deployments using WiMAX devices today, some of them are pre-WiMAX but once the 2.3GHz profile is available for certification, those operators will then require the vendor to come in and get the product formally certified.

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