

## From the desk of Rouzbeh



Dr. Rouzbeh Yassini

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The University of New Hampshire's Broadband Center of Excellence (BCoE) wishes our readers and contributors a very merry Christmas and happy and prosperous New Year. We conclude the year on an encouraging high note for TV White Space (TVWS) which has gained some momentum since mid-year. We continue to believe this technology, with support from large corporations, could represent the best chance for deploying universally available broadband. But lots more work needs to be done on development, standardization and ultimately creation of affordable hardware.

What follows is an update on the status of Microsoft and its work on TVWS. And we have another in our series of reports on standards in broadband wireless technology from my colleague Paul Nikolich, Chairman IEEE 802 LMSC and an IEEE Fellow.

### TVWS

Our update on Microsoft Airband Initiative notes that in October Microsoft announced a new partnership with wireless equipment provider Redline Communication. Recall that in July Microsoft and RADWIN had announced a strategic partnership to develop TVWS based solutions, available second half of next year, as noted in our [AUGUST 2018](#) newsletter. It's becoming obvious Microsoft is willing to work with multiple equipment providers to get Internet to the unserved as quickly as possible.

Microsoft also has announced agreements with broadband service providers willing to expand footprint in sparsely populated rural areas in the U.S. including Packerland in Wisconsin and Michigan, Network Business Systems in Illinois, Iowa and South Dakota and Native Network in rural Washington and Montana. BCoE commends Microsoft in its initiative to bridge the digital divide, not just in words but also in action. Working with service providers and equipment providers falls in line with Microsoft's Rural Airband Initiative that includes investment in partnerships with telecommunication companies serving rural areas and stimulating investment in TVWS equipment through technology licensing and royalty-free access to Microsoft patents and sample source code related to TVWS technologies.

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### **IEEE — Paul Nikolich**

Last month, I attended an IEEE 802 LAN/MAN Standards Committee (LMSC) plenary session held in Bangkok Thailand. Several interesting activities were initiated, while much progress has been made on completing existing projects. For example the next generation wireless LAN study group activity, dubbed extremely high throughput or EHT (or what will be known as Wi-Fi 7) is underway. The 802.11 Wireless LAN Working Group experts are in the process of identifying the precise scope of the key features that will be standardized by this future project; throughput, range, reliability, latency, full duplex, etc. I anticipate the project to take five years to complete, making it all the more difficult to peer into our crystal ball and identify the highest priority forward looking features. However, given the past success of the 802.11 Working Group, I'm confident they will steer us in the right direction.

Meanwhile the 802.11ax High Efficiency Wireless draft standard task group is nearing completion of its work, and I expect it to be ratified in late 2019/early 2020. We also recently saw pre-standard 802.11ax product for sale, which means the vendor community is confident in the stability of the draft standard, and we should expect a lot more product in 2019 that will be known as Wi-Fi 6. This technology will efficiently provide higher capacity in dense environments, characteristics that are important for the explosive growth of Internet of Things (IoT) end points.

And the 802.3 Ethernet wireline group completed a brand-new project authorization request for the Super-PON amendment. This standard amendment project will enable passive multi-drop fiber optic networks to significantly increase the reach and density of PON networks at relatively low cost, enabling service providers to economically deliver 1000+ Mbps Up/Down broadband access services to homes and businesses in urban/suburban environments. The work has attracted much interest from a diverse community of optical, silicon, system and service providers.

Meanwhile, the remainder of the 802.3 Ethernet group continues to progress work on amendment projects for long range, single twisted pair, multi drop interfaces to be used in automotive and factory environments; multi-gig automotive, 400 Gbps single mode optical and several more.

As a bonus Paul was able to visit with Thailand's equivalent of the USA's FCC, the National Broadcasting and Telecommunications Commission (NBTC) of Thailand, to discuss their plans for rolling out regulations to support TV Whitespace broadband access services and technologies. TVWS is on their roadmap to be deployed in the 2022-time frame, but first they need to reallocate and relocate the existing broadcast services spectrum (many of which remain analog) to digital TV which will take a few years.



The NBTC is optimistic that TVWS will be a useful technology to provide broadband access services to their rural population, much of which is entirely unconnected at this time. Perhaps by the time Thailand is ready to adopt TVWS based broadband access services, vendors will have deployed 802.22 Wireless Regional Access Network compliant and economical equipment. One can only hope.

### **Conclusion**

So, as you can see, wireless technology is moving ahead. I continue to believe that it provides us with the best chance of connecting the 3.9 billion worldwide who continue to lack access to adequate, affordable broadband. It's going to take time.

Until then, I hope you all have time with family and friends to enjoy our holiday season.

**Rouzbeh**