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REGIONAL REPORT

LiFi's Got Talent Seminars: An Imagined Story in Engineering Society

By Keattisak Sripimanwat (D.Eng), Thailand Chapter Chair

The 10th anniversary of the Thai telecom knowledge management with LED applications talk in order to celebrate the International Day of Light (IDL) 2018 in Thailand was jointly organized at the MoonMung ISAN exhibition, Sakon Nakhon Rajabhat University, on Feb 22-24, 2018. Selected topics were continuously developed from the successful 2017 Thai ComSoc tours emphasizing visible light communication (VLC) and its migration to "Light Fidelity" or LiFi. That series was done again on the day of light (March 16), online and at a few other meetings throughout the year.

The session was started with LiFi viral clips. Popular trailers were shown, followed by observing the content of major LiFi publications. Again for this year, audiences were frequently reminded to re-consider four basic criteria during the talk, whether LiFi is: low cost LED or expensive and complex laser; fixed wireless communication or with mobility; dual lighting with data or communication solely; one way (simplex) or full duplex-optical communication.

Prior to unveiling LiFi talents, a collection of hot news and rumors were discussed. For instance, LiFi was chained to 3G mobile by posting a dongle tethering to a phone or a laptop. A top phone's source code was decrypted finding LiFi inside. A number of news items were shown on its implementation at hospitals, schools, underground, trains, cabins, and even in warships. An active industry was also found in the marketing reports, which forecasted a potentially multi-billion dollar market in the next few years. Impressively, it seems that LiFi has already played important roles in our society.

After updating with fantastic information, audiences realized coincidently that the most basic LiFi is expected as "a WiFi's counterpart: a man roaming under a normal LED bulb as a hotspot with high(er) speed Internet via light to and from his phone".

Technically, samples of claimed LiFi are similar to the magical devices running well only on a few fingers but the rest of its body were powered by imagination as promoted. None of them satisfies "light fidelity" for being a counterpart with WiFi. Of course, independent or full review of those implemented cites has not been found.

Following with unpopular news, the first VLC R&D group founded on 2001 in Japan, was already ended. Also, a VLC director of the world class Korean mobile company who filed the highest number of related patent, has switched to other research areas since 2015. Moreover, significant investment in high speed personal wireless communication via LED light was not found in any major manufacturing country of consumer products. Up to the recent 5G era, none of the mobile industrial standards welcome mobility on lightwave communication. Not only that, amazing and expensive market reports have been queuing to be expired, meanwhile the real LiFi market is still on the ground. In fact, it has never been listed on the Hype Cycle for emerging technologies either.

Eventually, most audiences agreed that their expected LiFi (illumination simultaneously with gigabit data streaming connecting to multidirectional optical transceivers of a mobile device), could be commercialized only in the animation industry. In last year's report, 'A White Paper - Seminar: "LiFi's True Story vs Fake News, IEEE GCN - Oct 2018', LiFi "without" lighting purposes is however still possible where ultra smart room plugging with invisible laser communications and pointing million angle beams to and from super high-tech phone. But that might be only for James Bond in the SciFi movie with no matter of consumed time, cost, or complexity !

Later, LiFi has been appearing on arbitrary mutation from being a WiFi's counterpart. Whatever KIT that could blink or detect light for whatever purpose, it could be named LiFi too. More doubt and complaint to the backstage of LiFi are then sparked as in public articles: "Li-Fi to replace Wi-Fi? Sounds Like Sci-Fi"; "New VLC Product: You Won't Be Able to Buy It (Yet)". Furthermore, the world's top media seem to be fading after reporting previously without full verification: "LiFi: 100

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A seminar at MoonMung ISAN exhibition, Sakon Nakhon Rajabhat University.

REGIONAL REPORT

IEEE Santa Clara Valley (SCV) Lecture and Tour of CoreSite Multi-Tenant Data Center

By Alan J Weissberger, IEEE Technology Blog Content Manager and Author, USA

On May 23, 2019, over 30 IEEE ComSocSCV and IEEE Power Electronics members were treated to a superb talk and tour of the CoreSite Multi-Tenant Data Center (MTDC) in Santa Clara, CA. Key findings and take aways are summarized in this article.

CoreSite is a data center owner/provider (structured as a REIT) that competes with Equinix, Digital Realty, CyrusOne, QTS, and others. Our lecture and tour were conducted by CoreSite technical specialists Jameson Agraz and Gerry Fassig who both did a superb job!

Overview

CoreSite MTDC colocation customers have their own spaces, varying from partial cabinets, private cages up to private suites. The customer provides their own compute, network and storage infrastructure, while CoreSite provides fiber optic based network access, power distribution and backup, physical security, and Remote Hands (via on site staff) if requested.

The following types of Network Access are available to CoreSite MTDC customers:

- Direct Access to Tier-1 Networks from telcos and cloud service providers
- Access to a broad range of network services (Transit/Transport/Dark Fiber/Lit Fiber)
- Direct Access to Public Clouds (Amazon, Microsoft, Google, etc.)
- Direct Access to Optical Ethernet Fabrics

CoreSite has many data centers in Santa Clara, CA because of the relatively low electricity rates charged by Silicon Valley Power. (Note: this author has lived in Santa Clara for 49+ years, but not because of low electricity rates.)

CoreSite provides power distribution and backup on power failures, which includes:

- Standby Generators
- Large Scale UPS
- Resilient Design
- Power Quality
- A/B Power Delivery
- Six 9s Uptime

CoreSite also provides physical security, including:

- 24/7 On-Site Security Personnel
- Dual-Authentication Access
- IP DVR for All Facility Areas
- Perimeter Security
- Equipment Check-In/Out Process
- Access-Control Policies (Badge Deactivation, etc.)

CoreSite's MTDC Network Access and Topology

There are 28 network service providers and cloud on ramp providers, including eleven unique fiber providers, which maintain a presence in the CoreSite Santa Clara MTDC campus. The purpose of that is to enable customers to share fiber network/cloud access at a much higher speed and lower cost than would otherwise be realized via premises-based network/cloud access.

While the names of the all the network and cloud service providers could not be disclosed, some of the network operators included: Verizon, AT&T, Century Link, and Zayo. In addition, AWS Direct Connect, Microsoft Azure ExpressRoute, Alibaba Cloud, Google Cloud interconnection and other unnamed cloud providers were said to have provided direct fiber to cloud connectivity for CoreSite's Santa Clara MTDC customers.

Here is how connectivity is provided within and outside the CoreSite MTDC:

The SMF (Single Mode Fiber) or MMF (Multi Mode Fiber) from each customer's colocation cage is physically routed (under raised floor) to a fiber wiring cross-connect/patch panel box maintained by CoreSite. The output fibers from that box are then routed to a private room where the network/cloud providers maintain their own fiber optic gear (fiber optic multiplexers/switches, DWDM transponders and other fiber optic transmission equipment) which connects to the outside plant fiber optic cable(s) for each of the respective network/cloud service providers.

That arrangement facilitates very quick and easy access to a different network operator/cloud service provider if the customer wants to switch providers.

The outside plant fiber fault detection and restoration are done by each network/cloud provider- usually via a mesh topology fiber optic network or 1:1 protection switching or N:1 hot standby. CoreSite's responsibility ends when it delivers the fiber to the network/cloud service provider colocation cages. They do, however, have network engineers that are responsible for maintenance and troubleshooting all of the wiring/connections within the CoreSite MTDC when necessary.

Enterprise Network Access via the CoreSite Interconnect Gateway

For remote access, CoreSite offers an Interconnect Gateway-SM which provides their enterprise customers a dedicated, high-performance interconnection solution to reach their cloud and network service providers. This CoreSite's Interconnect Gateway directly integrates enterprises' WAN architecture into CoreSite's native cloud and carrier ecosystem using high-speed fiber and virtual interconnections. This is shown in the illustration below courtesy of CoreSite.

The CoreSite Interconnect Gateway includes:

- Private network connectivity from the Enterprise to the CoreSite data center
- Dedicated cabinets and network hardware for routing, switching, and security
- Direct fiber and virtual interconnections to cloud and network providers

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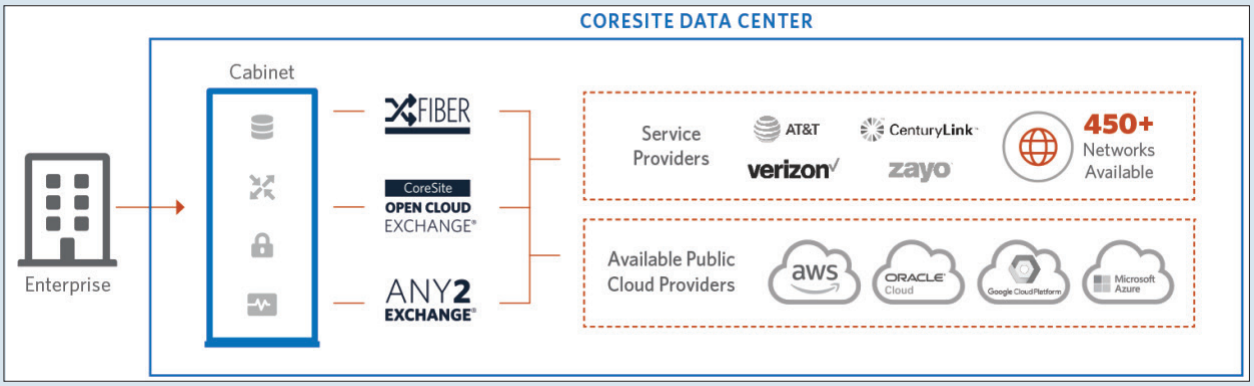

REGIONAL REPORT

IEEE Presence at Asia's Mega Technology Event

By Ewell Tan, IEEE Asia-Pacific Limited, Singapore

Once again, IEEE is proud to be one of the supporting organizations for ConnecTech Asia. This is the 4th time IEEE partnered with ConnecTech Asia (previously known as CommunicAsia). This year, ConnecTech Asia was held at Marina Bay Sands and Suntec Singapore on 18-20 June 2019. Comprising BroadcastAsia, CommunicAsia and NXTAsia, this regional event unveils Asia's digital future by highlighting emerging smart technologies (such as 5G, IoT, AI, Smart Cities and Blockchain) that are shaping the region's digital landscape. The show boasts key technology brands such as Alibaba Cloud, Amazon, Ericsson, Google, Huawei, IBM, Microsoft, NTT DOCOMO, Red Hat, Singtel, Verizon and VMware showing their latest technology innovation. One main focus of this summit is 5G technologies, which enable a smarter and more connected world. The conference has attracted 40,000 C-levels, decision makers, end users, and professionals from across the world.

The Guest of Honor, Mr. Tan Kiat How, Chief Executive of the Infocomm Media Development Authority (IMDA), gave an opening speech at the summit. In his speech, Mr. Tan pointed out the digital technology is sparking innovation, boosting productivity, spurring economic growth and raising the standard of living for societies around the world. All sectors shall work together to harness the full benefits of digitalization.

Through the partnership, Tay Kok Chin, Chairman of the Smart Cities Network (SCN), was invited to be the moderator for the Internet of Things and Smart Cities session. Prof. Yu Chien Siang, Chief Innovation & Trust Officer of Amaris.AI, was also invited as a speaker to dive deeper into the topic of how artificial intelligence (AI) will disrupt today's innovation practices. Companies have started to invest and build capabilities in AI as it will gradually become more cost efficient.

Staff from IEEE Asia-Pacific (from left to right): Tom Seah, Richard Chandra, Alex Liu, Min Bia Gunawan, Ewell Tan. Leo Hwa Chiang and Melody Koh are not in the picture.

In addition to the mega summit, both the IEEE Broadcast Technology Society and IEEE Asia-Pacific had an exhibit booth at the show to promote, engage and network with regional industry players and companies. IEEE represents a crucial partnership that provides additional networking opportunities for engineers, scientists, technologists, and policy makers to stay abreast of the latest technology advancement.

CHAPTER REPORT

IEEE ComSoc Harbin Chapter Strengthened the Connection with Campus

By Weixiao Meng, Harbin Chapter Chair, China

NO.1805003, a freshmen class at Harbin Institute of Technology held a leadership training activity on April 2, 2019, aiming at learning about the organization information of IEEE ComSoc, guiding students in life planning. In order to make conference discussions more efficient, the Chair of the IEEE ComSoc Harbin Chapter, Professor Weixiao Meng, was invited to attend the event.

A freshmen class of Harbin Institute of Technology, China.

First, Prof. Meng introduced the name of IEEE ComSoc, its development history, its influence around the world, and the profound function that it played in the growth of communication engineering. In addition, Prof. Meng explained some common sense knowledge, for example, how to calculate the life of a fellow. During the event, the students asked Prof. Meng many questions about the chapter, and Prof. Meng answered patiently. He recommended that joining the chapter is a great choice, both in terms of learning knowledge and expanding horizons. After the meeting, many students contacted the student chair of the IEEE ComSoc Harbin Chapter, and expressed their strong desire to join the chapter.

The students also asked questions about the difficulties encountered in college life, studying abroad and so on, and Prof. Meng answered conscientiously. He encouraged college students to plan their life ahead of time according to their own characteristics, and pay attention to the aspects related to the individual's future planning on the condition of laying a good knowledge foundation. He stressed that the most important thing is not to waste time.

After Prof. Meng's all-around and considerate explanation, the students had a better understanding of IEEE ComSoc, and they had a clearer plan for their lives. The event came to an end with warm applause. Pro. Meng presented Souvenir T-shirts to the students on behalf of IEEE ComSoc Harbin Chapter. Participants of this event took pictures together.

DISTINGUISHED LECTURE TOUR

IEEE Communication Society Distinguished Lecture by Prof. Ashutosh Dutta on 5G Networks: Opportunities, Challenges at NIT Rourkela, India

By Sambit Bakshi, National Institute of Technology Rourkela, India

The Centre for Alumni Relations and Resource Generation of the National Institute of Technology Rourkela organized an IEEE Communication Society Distinguished Lecture on "5G Networks: Opportunities and Challenges" on 07-March-2019 by Prof. Ashutosh Dutta. Prof. Dutta is a Senior Wireless Communication Systems Research Scientist and Lawrence Hafstad Fellow at Johns Hopkins University Applied Physics Labs (JHU/APL), Maryland USA, and also an alumnus of NIT Rourkela. He also participated in a pre-talk 5G sensitization discussion session with faculty members of NIT Rourkela to explore the possibilities of furthering 5G research. The meeting was chaired by Dr. Shantanu Kumar Behera, Associate Dean, Alumni Relations.

Dr. Dutta presented his valuable lecture describing the state-of-the-art of 5G research and discussed the immense possibilities of fast and reliable communication with 5G. Prof. Dutta lucidly explained the architectural differences of 5G from its previous generations. More than 50 faculty members and scholars of the Institute attended the talk. Prof. Dutta highlighted potential areas of real-time communication that can be made possible by 5G technology. The societal impact and expected coverage of 5G technology in developing countries such as India within a couple of years was discussed. In addition to his technical talk, he also provided an overview of the IEEE Future Networks Initiative and various roadmap activities that faculty and researchers can get involved with and contribute to.

Prof. Ashutosh Dutta during his talk at National Institute of Technology Rourkela, India.

The talk was technically co-sponsored by the IEEE Computational Intelligence Society Intelligent System Application Technical Committee. On behalf of IEEE CIS ISATC, Vice-chair Dr. Sambit Bakshi hosted him and thanked him for his visit to NIT Rourkela and the valuable talk and interaction.

LiFi/*Continued from page 1*

Times Faster than WiFi"; "Forget WiFi: Meet the New LiFi Internet"; and "Wireless Data from Every Light Bulb".

From all the seminars, the two most frequent questions asked were: Without proving of its availability, how multi-awards and honors based on LiFi had been granted? If LiFi is successfully built in the future, how will everyone benefit, not just those who can afford it? One interesting answer was offered from an audience member: Because "LiFi performs very well in the movie then both social responsibility questions should be answered by James Bond!"

Finally, the rhetoric of this eyes-catching technology has been promoted impressively already for a long decade with encouragement to imagine a new high speed Internet via light bulbs as a counterpart of WiFi. In contrast, "misconception" has also been defended once people really asked for their imagined LiFi. A few past seminars were then ended with a discussion of IEEE ethics. This resulted in optimistic suggestions; however, at least LiFi is a very good value added technology that could prolong the saturation of the LED lighting industry, even not on LiFi itself. This field has obtained quite a high number of new engineering graduates and publications. In order to deliver talent effectively, the engineering society may just need more essential skill on (mass) science communication rather speaking paradoxically of "imagination vs misconception".

All of the 2018 seminars concluded that experts from the faculty of social sciences, humanities, or phycology should be invited to participate in future technical development. Since our society has received a lesson from this long-time LiFi mesmerizing, engineering skill alone can not handle those side effects. Multidisciplinary teams should foster labeling scientific works with social responsibility and co-judge for fair and proper engineering talent toward real adoption, not just for the stage of a talent show.

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Stefano Bregni
Editor-in-Chief
Politecnico di Milano, Italy
Email: bregni@elet.polimi.it, s.bregni@ieee.org

Fabrizio Granelli
Associate Editor
University of Trento, Italy
Email: fabrizio.granelli@unitn.it

IEEE Communications Society – Member and Global Activities
Nei Kato, Vice-President for Member and Global Activities
Song Guo, Director of Member Services
Lisandro Zambenedetti Granville, Director of LA Region
Wahab Almuhtadi, Director of NA Region
Adlen Ksentini, Director of EAME Region
Saewoong Bahk, Director of AP Region
Octavia Dobre, Director of Sister and Related Societies

Regional Correspondents Who Contributed to this Issue
Ewell Tan, Singapore (ewell.tan@ieee.org)

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Santa Clara Valley/*Continued from page 2*

- Technical integration, 24/7/365 monitoring and management from a certified CoreSite Solution Partner
- Industry-leading SLA (Service Level Agreement)

Postscript

After the talk and tour, I received many compliments and thank you notes from IEEE ComSocSCV and Power Electronics members. Indeed, network connectivity, power savings and up time are certainly the two biggest features delivered by MTDC providers. Below is one such comment from a longtime colleague.

Comment from Craig Matsumoto, Data Center Networking Analyst at 451 Research:

"Alan, thanks for arranging the CoreSite MTDC tour. It's always good to get a view of where the bits actually flow. So much thought has to go into the physical, practical things, like supplying power ... it was interesting to hear that power substations built specifically for data center usage have become a trend (they were saying Silicon Valley Power (SVP) was able to do something like that because of that corridor of data centers running along Central Expressway in Santa Clara, CA.) Great stuff – many thanks!"

Reference

Slides of the IEEE/CoreSite Presentation and Tour: Multi-Tenant Data Centers can be downloaded for free from: http://comsocscv.org/docs/MTDC%20CoreSite%20Tour%2023May2019%20IEEE-Comsoc.pdf