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Metcalfe picks the gems from NetEvents Ethernet Innovation Summit

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Ethernet creator's closing keynote highlights key take-aways from 2 days' intensive discussions on future of networking innovation



Bob Metcalfe, University of Texas Austin Professor of Innovation, but better known as the co-creator of Ethernet, gave the opening and closing speeches at the NetEvents Ethernet Innovation Summit, May 22/23, in Silicon Valley's Computer History Museum. The event was celebrated with two days of intensive discussion and debate around nurturing innovation, future developments in networking and the communications landscape that was being shaped by Ethernet. The evening gala dinner, with Innovation Award ceremony and charity auction, raised over \$35,000 for STEM (Science, Technology, Engineering & Math) education.

On May 22nd, 1973, Bob Metcalfe had employed the term "Ethernet" in a PARC memo outlining the concept. Exactly 40 years later his opening keynote presentation emphasised that, while he is heralded as Ethernet's inventor, close colleagues including Dave Boggs, Butler Lampson, Chuck Thacker, Tat Lam, as well as hundreds of Xerox PARC employees. The Ethernet of today is a far cry from that original but, as Bob explained, the key fact is that the packet format and type field has not changed – allowing innovation to build on a foundation that is not only robust, but also offering backwards compatibility. Today's innovators should learn from this.

Bob's closing keynote was another highlight, with the audience captivated by his recollections – like being told that the commoditisation of Ethernet would doom 3Com whereas the volumes made even more money: "3Com is the most successful acquisition HP ever made." Bob also summarized some key points that had arisen during the two days of discussion and debate.

Twelve panel discussions on the first day looked into many aspects of innovation. One disturbing conclusion was that basic scientific research, and its transition into marketable products, is underfunded in the US to the extent that the US is in danger of falling behind its global technology competitors. According to Bill Spencer, former head of Xerox Research and Palo Alto Research Center (PARC): "Research labs like Xerox PARC, IBM and Bell Labs are no longer in existence today." As a result: "the funding of new ideas is hurting." Judy Estrin, former Cisco CTO and current JLab's CEO added that government-sponsored research is also on the wane: "Government funding for basic science is not only down, but it

is allocated in a different way. The way the DOD used to fund basic research is very different than what we have today; and the NSF is great, but it can't address all the problems that we have." At Xerox PARC people could explore long enough for an idea to develop to the point where it could inspire a startup to obtain funding and bring it to market.

Former Stanford Research Institute (SRI) researcher Bill English, co-creator with Doug Englebart of the computer mouse before moving to Sun Microsystems, regretted changes in government funding: "I think today our government has devolved to the point where the question asked in any cases of funding plays politically, and that's unfortunate." According to Estrin: "In China they do a better job investing in science and research, but not the whole cycle." She also cited Israel as not investing much in basic research, but good at the later parts of the cycle, "probably because of the strong investment [by] the military." However, according to Spencer, the US excels in the final stage: "I don't think there's any place in the world that is a better place to take an idea to the market than the United States." He also praised the universities: "If you look at the top universities worldwide, 18 out of 20 are in the United States".

Other sessions focused on standards, the status of Ethernet and the way ahead. Ethernet is becoming a universal language, looking less like a technology and more like a service offering – with serious implications for carriers. Virtualization and the rapid take-up of the cloud have enabled the fast deployment new services, "but the best is yet to come". The second day began with a keynote by Glenn Ricart, Founder & CTO, USIgnite who later argued for a localization of micro-datacentres moved close to end users to minimise latency. He summed up the debate around standards saying: "Good standards become a platform for further innovation. They evolve, they change, they expand other opportunities for devices that nobody ever imagined would even exist."

Big news in the Ethernet Cloud discussion began with MEF president, Nan Chen, announcing their new Service Operations Committee "to define, streamline and standardize processes for buying, selling as well as operating and delivering MEF-defined services." Then James Walker topped that by announcing the launch of the CloudEthernet Forum in collaboration with the MEF: "It looks to achieve many things, all of them of concrete benefit to end customers who are building large-scale, complex, sophisticated data centre environments". The eleven founding members are : Alcatel Lucent, Avaya, Citrix, Equinix, Huawei, HP, Juniper, PCCW Global, Spirent Communications, Tata Communications and Verizon. Later in the discussion Kamal Dalmia, Aquantia, produced the surprising statistic that 80-90% of today's data center connections still rely on 1G Ethernet – prompting Steve Schultz, Intel Networking Division, to add that the time taken to reconfigure the network has become the bottleneck, while servers can be deployed in minutes.

The next session SDN Is Not the Future – It's NOW took up that point, with Sunil Khandekar, Nuage Networks, saying: "The perfect use case for SDN is in the cloud data centers." Mike Marcellin, SVP Juniper, saw a big opportunity to address BYOD: "As you start to virtualize the control functions of the wireless infrastructure and integrate those with the control and management functions of the physical infrastructure, it starts to look like an opportunity for SDN." Turning to the enterprise, for Dell's Arpit Joshipura, one of the most popular recent use cases was multi-tenancy: "The multi-tenancy use case we've seen, service chaining keeps coming up, also a layer four through seven secured wired/wire line policy". Also for HP's Dave Larson: "I think the multi-tenancy network virtualization orchestration piece is the near-term revenue driver. Longer-term I think security is the real opportunity."

The debate on the next wireless standard 802.11ac cast some doubts: it offers faster

throughput but not without disadvantages, especially when several access points are densely packed. Enterprise demand isn't expected to arrive until next year at the earliest, but clients are ready now so wider take-up could be quick. Angus Robertson, Spirent, pointed out: "The carriers are focused on offloading a lot of their cellular or LTE data onto wifi. However, what a lot of the carriers see today is that many of their customers actually turn off wifi because it's slower than LTE."

The final session before Bob Metcalfe's closing keynote was The Next five Years – Strategic Planning for CIOs and CISOs, raising a host of radical ideas beginning with the Internet of Things – including medical implants to transmit body metrics to medical devices for diagnosis – and majoring on real-time analytics and Big Data. Brian Smith, Click Security pointed out that: "Friends of mine that run university networks say that they're seeing 7 to 10 IP addresses associated with each student – with their Pandora radio alarm clocks and their cell phones and all the devices they bring." This would challenge to traditional security controls associated with IP addresses and physical devices.

Above, Bob Metcalfe with Paul Saffo