IEEE P802 view of history by Gary Robinson based upon the paper

Standardization of Local Area Networks
by Marvin Sirbu of Carnegie Mellon University and Kent Hughes of Pacific Bell

Regading the Sirbu-Hughes paper, a few paragraphs after they first mention the DIX (Digital, Intel, Xerox) group, Gary Robinson notes:

> *I joined Digital Equipment Corp, DEC, in March of 1980 as a full time standards persons. My past work had been in research and development, so this was a major change. My standards background up to then had been in storage device interfaces.*
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> *Very soon after I joined DEC I was presented with a suggestion that I attend a meeting on LANS at NBS, now NIST, with the intent that I take on this project. I had no idea what a LAN was but no one else was interested, so I agreed. This was technically the first IEEE P802 meeting because it was the first meeting after the PAR was approved. It was very well attended, a few hundred people, including a group from the inventors at Xerox and DEC. It was not clear to me if the organizers of this group wanted DIX, DEC, Xerox, and Intel, to contribute their design or not.*
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> *When I returned home I was asked to take on this project and to lead the participation of DEC, Xerox, and Intel, the DIX group because I had more experience in standards than anyone else. I was well established in ANSI SDOs as well as the IEEE, among others. Xerox invented Ethernet and had hundreds of LANs operating at less than 10Mbs. DEC worked with Xerox to increase the speed to 10Mbps and developed the hardware to support it. Xerox had a contract with Intel to develop ICs for Ethernet, so they were included in the DIX group. DEC had contracts with other semiconductor companies and they also participated in P802.*
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> *My first meetings with the DEC and Xerox network management groups made clear they needed and wanted Ethernet to be a standard, but because the project was very advanced "no" changes could be made. This "no" was modified over*

time. The DIX group also decided they would contribute their specification called the Blue Book to P802 at version 1.0. At this point it was not clear if this contribution was acceptable to P802 or if there would be opposition.

The next step was for me to form our DIX team. Xerox choose Robert Printis, and Intel chose Phil Arst as their lead representatives. After a few meetings Bob Printis and I began to work very close together where he taught me LAN technology and I taught him standards.

P802 meetings contained about 300 participants and met almost every month. After much discussion it was decided to divide the committee into subcommittees by layer. There were only a few of us that had standards experience and the IEEE had hardly any experience in this type of standardization, IEEE had most of its expertise in power and similar work. P802/LANs belonged in the Communications society but they had no standards committee so P802 was put in the Computer society which had a standards committee but very little experience.

There was also similar work being done in another ANSI committee called X3T9 with FDDI and 50 and 70 Mbps LANS and some international standards groups. ANSI called a meeting with IEEE and X3T9 members to solve the LAN turf issues. I participated as a member of both committees and we came up with a rule that above 40Mbps belonged to X3T9 and below 40 Mbps to IEEE. That was violated in later years when no one cared any more.

The DIX group of participants contributed CSMA/CD (we did not use the common name Ethernet, which was not trademarked) bluebook V 1.0. We thought this was what the group wanted, but we soon learned that there were many people that did not want CSMA/CD, that they had their own LANs in their back rooms.

In the Sirbu-Hughes paper, they discuss that the DIX group was dissatisfied with the speed at which the 802 group was moving toward a standard and, thus, "members of the DIX group approached members of the European Computer Manufacturers Association (ECMA) in attendance at the 802 meetings about the possibility that ECMA would standardize a CSMA/CD specification. About this Gary notes:

The action in ECMA was instigated by me. It so happened that the then President of ECMA was from Digital and worked very closely with me. He recommended that I become active in the ECMA General Assembly, GA. I then joined TC24, Networking, and raised the issue of Ethernet. ECMA was always looking for new work and was totally dominated by European manufacturers of which Digital and IBM were powerful members. But the Ethernet project was accepted and a ECMA standard approved. This project did exactly what it was intended to do, which was to spur P802 into action.

Now we had three major contributions, and few minor contributions, with three different access methods. The next years were spent fighting between the three access methods. Finally on one sunny day in Phoenix before lunch I wrote a short motion stating that there shall be at least three access methods and listed the three: Toke Bus, Token Ring, and CSMA/CD. During lunch I discussed my written motion with Bob Printis and after minor improvements I went to talk to Tom Phinney who was a colleague of the Chair, G Clancy, of the DELMAC subcommittee. I did this because if I made the motion I was sure the Chair would "lose" it Tom made the motion after lunch and it was discussed for quite a while, then we spent another long time discussing how to ballot, secret, one vote per person, choose one access method or many, etc.

After what seemed like an infinite amount of time the ballot results were announced. The motion was approved. From now on CSMA/CD could exist and it we would not have to worry about being thrown out at any time. My team knew this was aq major milestone but we did not want our competitors to know just how important it was so we did not say a word or celebrate in any way until to drove off to a distant restaurant and then let loose.

The Committee also agreed to allow each subgroup to proceed at its own pace; a CSMA/CD standard could be advanced without waiting for the token standards to reach a similar stage of readiness.

After a bit of delay two additional contributions were made. One was called Token Bus and was used mainly in industrial environments. The second contribution was Token Ring and came from IBM. The interesting issue here is that IBM had been developing this in its Zurich lab and this contribution was premature in that it was not ready for prime time and was not fully supported by IBM. This caused IBM problems for a long time in that there was always arguments between the IBM P802 representatives and IBM Engineering.

The next big event was the change from the Physical, DEMAC, ... groups to the dot committees. The 3 access methods worked very hard to complete their documents but IBM kept sending high level technical people to the CSMA/CD group to raise technical issues to slow them down. The last one was an attack on the CSMA/CD Start of Frame Delimiter,SFD. The argument was that it was not good enough, but we felt it was good enough and in addition, changing it would delay the work on the IC which was underway. A meeting of CSMA/CD supporters was called to work through this issue.

Many technical discussions were presented at this small meeting to support the current SFD. After all the technical discussions were exhausted I was asked to make a recommendation. Based upon my discussions with my personal consultant, my wife, a clinical social worker, I said we should Reframe. My wife explained what this meant. It meant reorganize. So I layed out a plan to reorganize P802 and then the group worked out a timing plan and who would contact whom, etc.

That is how P802 became 802.1,2,3,4,5 and the Executive committee. CSMA/CD became 802.3, Token Bus, 802.4 and Token Ring 802.5. Now we were really separate and one group would not interfere with the other group. We shook hands and went to work. The plan worked and all 3 access methods were approved and the market made its decision.

The only negative feedback I got on my reorganization was some of the members of the Exec committee that I chose caused problems for the Exec committee. I chose them for exactly that reason. I wanted them on the Exec

committee so they wouldn't cause CSMA/CD a problem in 802.3 but vent their issues in the Exec committee. During the 20th anniversary of 802.3 Bob Metcalf, the keynote speaker, thanked my wife for her input. (years later my wife actually met Bob).

In the Sirbu-Hughes, they note, "Approval of the token ring was also dogged by concerns over patents." Olof Soderblom who had patents a certain technology believed the 802 token-ring standard infringed on his patent. About this Gary says:

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The patent issue with respect to Token Ring was a great mode enhancer in the CSMA/CD community. In fact some people wanted to pile on and try to make things worse for Token Ring but I stopped this. The patent case was solved years later when the patent was basically thrown out because Soderbloom did some things wrong/bad.