Conversation between Maris Graube and Dave Walden, West Cafe, lunch time, Portland, OR, 2012-02-27

Maris came to the meeting with a copy of the 802 Standard Draft C, 1982 and the following pages which he gave to me:

1. a list of nine "802 highlights from 1979-1989" (the rough years of his involvement with the IEEE 802 standards effort) with names of other people we should contact (included as an appendix to this note).

2. a list of 34 IEEE 802 meetings from 1980 to 1989 with the locations of the meetings.

3. three pages showing [a typical?] IEEE 802 Monday-Friday meeting schedule; the organization of the 802 project in terms the IEEE Plenary executive committee, working groups, and technical advisory groups; the 802 executive committee with him as chair and the chairs of the 802.1 through 802.8 working groups.

4. a copy of the Operating Rules of the IEEE Project 802 (13 pages, revision of November 8, 1989).

Of the 802 Standard Draft C, Maris said he asked people to pull this together while it was not yet a standard.

In return Dave gave Maris a copy of the 2007 interview of Bob Stewart by Steve Diamond

Notes on the conversation (drafted by Dave and corrected by Maris)

Prior to being hired by Tektronix, Maris studied engineering at the University of Michigan and then worked for computer and aerospace companies in southern California. Then he moved to the Portland, OR, region to raise a family.

Maris was hired by Tektronix [in Beaverton, OR? Yes] to work on standards. HP had created the IEEE 488 interface, and Tektronix wanted to use it. Maris was hired to look out for Tekronix's interests in that standards effort.

However, 488 only worked over a 20 meter distance, and so Maris was interested in what might work over a longer distance. He was told about a group at Purdue, where Professor Ted Williams hosted the Purdue Workshopp for Process Control including networking for process control; and Maris joined that group. They were good people and quite far along in their effort. Maris became chair of that group for a couple of years, partly because he was a neutral participant not from the process control equipment companies such as Honeywell, Foxboro, etc. After a while, it became clear to Maris that cost was not a particular concern for this group; for process control applications reliability was the big concern. But he was interested in something that also would be relevant to the rest of the world where cost was a concern.

He met Bob Stewart [this is mentioned on page 8 of the Steward interview], and they talked about "Why not start a standards activity under the IEEE. Originally it was not clear whether it should be under the Computer Society or the Communications Society, but it ended up being with the Computer Society.

Maris needed to visit ANSI in New York to convince them that this fledgling IEEE standard works was a serious thing. Also ANSI coordinates standards activities in the US to be sure there are not overlapping efforts. IEEE 802 did not conflict with other standards being developed at that time.

Interestingly, his boss at Tektronix and Tektronix supported supported Maris's activities with the 802 standard even though the company didn't have much of a use for 802 (he tried to talk to them about using it).

The 7-layer model has already been on the scene as part of the Purdue effort, and they also started with that as part of the 802 effort. Originally, they worked on functional requirements because that was important to ANSI and to move the effort in an organized direction. set up three subgroups working on different aspects of LAN's, In the beginning, the three groups were (a) for media (the wiring and signaling), (b) the media access (CSMA/CD or token), and (c) the Link layer protocol. Another group, eventually 802.1, was concerned with the overall LAN architecture. But this had problems; as shown by the Rev C compendium, it became a smorgasbord of different technologies to be selected that would not lead to interoperability of independently manufactured devices. Eventually the working groups were reorganized. [The reorganizations is well explained at http://www.historyofcomputercommunications.info] Basically, they separated the warring factions so that they could work and vote independently by themselves on their favorite LAN technology.

Maris noted that the DIX Ethernet effort had a problem that it didn't have good error control -- it didn't have a Hamming distance of 4. Other than that it was a well thought out spec. Intel was making a chip for Ethernet and this was crucial to the success of Ethernet in Maris's thinking: practically speaking, "the chip will set the standard" (not the spec). However, Phil Arst at Intel didn't want to change the chip to include good error control. Thus, Maris thought at that point that the standard could not succeed.

I mentioned that a lot of what he did seemed to be more political (getting people to work together, breaking deadlocks between positions, etc.). Maris said, "I call this 'electro-political engineering'." At a Denver meeting [April 1981?], he had lined up chairs of three standards: Lidnisky for HILI 802.1, Carlson for LLC, Lon Loughry for 802.3, Bob Douglas 802.4, and Bob Donan for 802.5.

Carlson had worked on HDLC, and a guy named Funk from Switzerland pointed out at the Purdue Workshop the HDLC didn't have a good Hamming Distance -- this was the first time Maris learned about Hamming Distance. Hamming distance of 4 became one of

the 802 functional requirements. This was the major impasse to accepting the DIX proposal as the standard.

The 802 work was organized so it was organized bottom up (not top down from the IEEE or the Computer Society). They even raised their own money to support the standards activities, e.g., $1M at one point. The chair didn't get to vote except to break ties, and the executive committee's role included stopping redundancy among the various working groups. They spend a lot of time thinking about how the process should work [see document 4 noted at the beginning of this note]. For instance, people who came to two out of three meetings could vote. They didn't want to make it too hard to participate, but they also didn't want to let just anyone come to a meeting and vote.

By way of example, a fellow named Vic Hayes from NCR in The Netherlands came to them to talk about wireless. There were a lot of theoretical discussions. Maris was in favor of having that activity be part of the 802 effort, but he didn't think it would ever go anywhere. That was the beginning of 802.11 for WiFi.

In addition to his work with the 802 activity, Maris attended a lot of IEEE and Computer Society Standards Board activities, but was not otherwise ever involved in those "higher" levels of IEEE standards.

Regarding standards, Maris believes there needs to be (a) a business aspect, and (b) a reasonable implementation (e.g., the Intel Ethernet chip, or later the WiFi RF chip). A spec without a business need is not sufficient; a spec that can't be practically implemented will go nowhere.

Maris gave a small example of another standard. When he was pulling the 802 Draft C book together, he was given 9-track tapes for the various parts and worked in the Tektronix computer center to get them all converted to printable form. Consequently, he called Microsoft and asked for Bill Gates, but got connected with an able and friendly assistant. He told the assistant that the 802 effort needed 12 copies of Microsoft Word because that would be the standard format for documents in this standard activity -- so they could exchange files, merge them, etc. Microsoft provided the 12 copies for free, and Word became the standard for documenting 802. There were plenty of 802 standards that went no where, for instance, one he was interested in and help develop for process control involving Token Bus.

Ethernet was originally very different than it eventually became. The wiring was very unwieldy. It runs much faster now, and is much cheaper. Price was key Maris thinks. Most that remains of the original Ethernet is its name and the basic frame structure. [He notes that in Alice in Wonderland, the cat in the tree fades until only the smile is left.]

Token Ring had a problem in that a Swedish guy named Söderblom patented it. Then when it was becoming an 802 standard, he wanted license fees for Token Ring products. This interfered with Token Ring being low cost.

A key in the success of Ethernet is that Xerox allowed Ethernet to move into the wider world without charging for it.

Maris personally is more interested in Token Bus, and he started a company, Relcom Inc., to work in that area. They sell wiring products for anything involving process control of fluids, e.g., refineries, ..., "from beer to waste treatment". In this narrow area he is still involved with standards.

The GM MAP effort to get a common standard communication protocol for automation failed because they used then developing ISO standard at the next level up but TCP/IP won the competition and the ISO standard became irrelevant.

It was a very pleasant meeting with Maris, and I greatly appreciate the time he took to talk with me.

Appendix

Document 1: 802 highlights from 1979-1989

IEEE 488, Ted Williams Purdue Workshop, ANSI, PAR, Robert Stewart, Robbie Rosenthan, Harvey Freeman

Rationale for standard, functional requirements, early organization along ISO 7-layer model, operating rules

First draft "standard" and Microsoft Word as standard text

Reorganization into semi-autonomous groups

Ethernet, DIX, Hamming distance, the Intel chip, Don Loughry

Toekn Ring, star, the Söderblom patent, Bob Donan

Token Bus, MAP, Mike Kaminsky GM MAP project head.

WiFi and Vic Hayes

Dave Carlson, LLC, ISO Protocols, TCP/IP