Interview of Lee LaBarre and Paul Brusil

Interviewed by:
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James Pelkey: I'm with Lee LaBarre.

LaBarre: Test my powers of recall.

Pelkey: As everybody says. I had a meeting with Art Carr for four hours yesterday. He sat down, he's the president of Codex, and he says: "I'm not going to be able to remember much." At the end of it he said: "I can't believe I remembered all that!" As I said before, this conference that took place in 1979 seemed to me to have been a very important event in the early part of the LAN business. Maybe you could go back before that and share with me any observations or knowledge you have about data communications in particular, but LAN in particular, and how this conference came about. Then, maybe you could talk a little bit about the conference and what happened, that would be very helpful.

LaBarre: Well, actually, in late '78 or perhaps early '79, MITRE got interested in local area networking. We had always been interested in it of course, pioneering in it, but MITRE doesn't develop any products. What we wanted to do was to get together with some experts in the area and attempt to discover where MITRE should be heading in the first case in terms of local area networking. What were the issues? What we did was we set up a number of forums; we held a forum on the West Coast in which we called together experts in the area, and we held another one in Washington, D.C., and one in Boston. We invited experts in the area: Dave Clark, Bob Metcalfe, other such individuals, just to get together and try to brainstorm and give us some feedback as to what were the issues that we, MITRE Corp., should be looking at, and where we should be heading. Out of that experience grew the motivation for having this conference in 1979.

Pelkey: So those three conferences were held --

LaBarre: There were actually forums. We got a bunch of experts together in a room. We held one at the Copley Plaza in Boston, for example. I remember Bob Metcalfe it turns out is allergic to chicken so he couldn't eat the dinner.

Pelkey: Were these in '78? Did that March of '79 event come out of these forums that were held prior to that?

LaBarre: The March '79 event came out of these forums in the sense that we discovered that there were a number of issues, and we wanted to bring together into a forum of local area networking to discuss what those issues were, in a broader open forum. Before, these meetings with MITRE, one-on-one with a group of experts, they were not a whole bunch of invitees; they were in a room around a conference table, not truly publicly known information on the issues.

Pelkey: Did you have MITRENET at this point in time working?

LaBarre: Oh, yes. MITRE had, at this time, a synchronized, slotted network working, which had been working for years.

Pelkey: Sort of a ring?

LaBarre: Well, not really a ring. It was P-structure, but it was a slotted mechanism that was used for access. They also had adapted CSMA onto broadband, so MITRE broadband network as we have now, they were running a channel and it was only about a 300 kilohertz channel. It was fairly low speed, but we upgraded it now. We're running higher speeds. It was using CSMA. MITRE actually patented that CSMA on broadband.

Pelkey: Do you recall where that concept of CSMA came from? Was that out of Abramson and ALOHA?

LaBarre: Well, it developed out of Abramson, ALOHA, Ethernet work Metcalfe and all had done, but they had not applied it to broadband, and MITRE brought it to broadband.

Pelkey: What year did you apply it to broadband?

LaBarre: I don't remember if that was '78, '79. Greg Hopkins, who was working here, was the person who developed that.

Pelkey: Do you know where Greg is now?

LaBarre: Greg left us and went with Ungermann-Bass, and he is now one of the vice-presidents of Ungermann-Bass. He took a year off a little while ago, but I guess he's back with them. As a matter of fact, you'll find that a lot of the pioneers in local area network business, a few of them came out of the MITRE experience. Greg Hopkins of course, and you mentioned Steve Holmgren. There are others who have been with MITRE and gone to various other companies -- Interlan, etc.

Pelkey: So you had these forums and you realized that there was a real interest, and there were people out there and there were some real issues that needed to be discussed and were appropriate to discuss in a wider forum?

LaBarre: We actually had come in with some preconceived ideas as to what the issues were, and we discovered that what we thought were the issues were not really the major issues. There were higher level issues that were more important, and a lot of those issues had to do the entire protocol suite, the upper layer protocol suite. At that time we were more concerned with the access mechanisms in local area networks, and we grew to appreciate, because the experts that we had brought together had the ARPA experience, we grew to appreciate the requirement and the necessity for interworking these LANs, using higher level protocols: XNS, TCP, etc..

Pelkey: Did you access Vint Cerf during this period of time?

LaBarre: I don't remember if Vint was involved in these or not. He may have been. I'm working with Vint now quite a bit. I'd have to go way back --

Pelkey: So you became aware that it was not only the access, but really the protocol suites that sat on top of the networks and internetworking that were real issues in building a robust system.

LaBarre: Yes, there again, we also had the major issue then between terminal-to-host connectivity, in which quite often the LAN served the purpose of a wire replacement and gave you whatever the benefits were of a wire replacement in a local area, but the benefits of doing computer-to-computer communications were just evolving then. That's when, for example, Xerox was doing a lot of work at Xerox PARC with their workstations. That's really when the higher-level protocols began to be developed in local area networks, with computer-to-computer communications. It wasn't really until the '80s, with the advent of the microcomputer, that it became a reality that you could have a low cost workstation on your desk that ran all of these high-level protocols, so that's one of the stages we had to go through. Before you had to have -- simple connectivity was the issue. In those places where people had the high-powered workstations on their desks because they could afford it, like at Xerox, they were looking at the other issue, which was the computer-to-computer connectivity, and sharing information. That was a major eye-opener, because I hadn't come from that experience.

Pelkey: You had done terminals to multiple mainframes.

LaBarre: Right, and that's really the way the LAN business grew up. It was wire replacement. That's where you see Sytek and Ungermann-Bass -- most of those grew up that way. It was only with the advent of the microcomputer and the ability to put things on boards and be able to plug boards into PCs with high level protocols and all that you began making these low-cost PCs here actual workstations that can run all these higher level protocols.

Pelkey: How did this get-together in March come about?

LaBarre: I'm trying to think how that came about. I'm trying to think who even chaired that. Let's see if I can find the proceedings from that.

Interruption in the Interview

Pelkey: Paul Brusil has just joined us, and we have found this publication that relates to the May '79 conference, which is the Proceedings of the LACN Symposium, May 1979, and the get-together in March at the Copley Plaza was really one of those three forum settings, where Saltzer and Clark and Metcalfe were in attendance at that forum. Do you recall who attended the ones in Washington or the West Coast?

LaBarre: I believe Shoch, Huff may have attended it. Bud Lipsky was at that, wasn't he? He may have been.

Brusil: I don't know. I never went to one.

Pelkey: [Pointing] This guy started the company.

Brusil: Wasn't he the guy who showed up with the red beret?

LaBarre: No, that was at a different meeting.

Pelkey: That sounds interesting.

LaBarre: I can't really remember all the people involved in that.

Pelkey: What about Washington?

LaBarre: The Washington one is a blur.

Brusil: Sounded like the West Coast one was a blur to me.

LaBarre: I think the West Coast one helped to focus in terms of coming up with more issues so that we were able to focus on more of the issues in the later ones.

Pelkey: So the West Coast was the first one?

LaBarre: West Coast was the first one.

Pelkey: Was the one here at the Copley the last one?

LaBarre: Yes.

Pelkey: So by that time you were on a roll.

LaBarre: By that time we thought that we had discovered, really, what some of the major issues were, and were able to address those issues. We proceeded to address them over the following years. Fortunately, I left MITRE at the time, and Paul was left here to address them. I came back in the summer and addressed them.

Pelkey: Accepting the fact that memory for you is a blur, is there anything outstanding that you remember about that forum at the Copley about the discussion or the interactions of people?

LaBarre: Well I remember, in terms of -- the major issue was, as I recall, we were really concerned with the wrong issues. The real issues were the upper layer protocol issues and not the access methods, which we had been concentrating on, and the whole industry had been concentrating on up to that point. Also, the issues were going to be computer-to-computer communications over local area networks, as opposed to terminal-to-host communications.

Pelkey: Metcalfe up until that point in time had been a consultant at MIT, and MIT was in the throws of what kind of a network they wanted to put in campus-wide. They eventually selected the token ring, as you know. My understanding is that, at least Bob Metcalfe's remembrance is that if he had been more successful in that session, that forum, in terms of beating down the concepts of token ring and arguing his case better, maybe Ethernet would have been more successful. He remembers that as being an important session.

LaBarre: In terms of discussing access methods?

Pelkey: Just in terms of getting support behind Ethernet or ring or other alternatives.

LaBarre: Well, the token mechanisms were just evolving then. They weren't really out in the marketplace as such. They weren't really even in the standardization process or near standardization. Of course, the standardization process for Ethernet hadn't even started.

Pelkey: Didn't start until '81 or something.

LaBarre: But the token stuff was even further behind that. The IBM token passing used in their local loops essentially. It's amazing it took them ten years to even get that to bringing it into the standards area.

Pelkey: Prime was shipping a token ring.

LaBarre: Prime was (unintelligible) ARCnet. Datapoint was doing ARCnet. Oh, I was trying to think of the name of the person from Datapoint that was there -- he was one of the prime developers of the ARCnet -- [long pause]. [John Murphy?]

Pelkey: I can see you're going to be real helpful?

LaBarre: If you can find out who the prime developer of ARCnet was, then you know that he was there. [Much laughter]

Pelkey: I'll give you six weeks before I send this to you, so maybe you can make some notations.

LaBarre: Maybe I will remember by then. These things have really been buried for a while.

Brusil: I was trying to remember what our motives were for getting with NBS to host this thing, and my recollection is that both of the organizations realized the need for local networking technology for a variety of sponsors, and that we needed to have a wide forum, where we could bring together potential vendors as well as users, where the users could say: "We really need this networking," and that the vendors could hear and say: "Gee whiz, maybe there really is a need for networking, and we ought to start thinking in terms of developing products," because it was shortly after this conference that the local networking industry started taking off. MITRE had been playing in developing prototypes internally for a number of years up to this point and was certainly doing that in conjunction with NBS. We did have some sponsors -- some Air Force sponsors. National Library (unintelligible) some sponsors that wanted to have networking, and at that point the only thing we could point to is to say: "Here are some schematics of the stuff we built." I think that procurement, in conjunction with this symposium, was kind of the kickoff to vendors thinking: "Gee whiz, maybe there is a market there that we need to go after." So I guess I see this conference as one of the major turning points in the creation of the LAN industry.

Pelkey: The following month after this conference is when Ungermann-Bass, Sytek, 3Com all kicked on.

LaBarre: That's right.

Brusil: That's right. It was about half a year after we had started putting out this RFP to make Chinese copies of our MITRENET. Then all of a sudden all these other companies said: "Wait a minute. We've got a slightly different way of doing it." We shouldn't do Chinese copies because we got our own way. And then the 802 stuff started coming about.

Pelkey: Before we get to 802, did Ralph Ungermann or Charles Bass participate in any of these MITRE things, or did Mike Pliner or anybody from Sytek?

LaBarre: Not that I recall.

Brusil: I don't recall.

Pelkey: So they had their own views and they were doing their own thing, although Ungermann, when they got going, they hired some people from MITRE to join them.

LaBarre: Oh, yes, a number of people. A number of people had left MITRE to go to other companies, and then migrated to Ungermann-Bass or Sytek.

Brusil: If I recall, MITRE populated Sytek as well as U-B for the first couple of years.

Pelkey: MITRE was one of the few places where there had been experiments, where there was technical talent that you could go raid if you're going to try to build a company. You could try to raid out of Xerox PARC, but that was more of an Ethernet culture, and you couldn't get a lot of people out of that environment.

LaBarre: Well actually Sytek grew out of Ford Aerospace, what they were doing there, Ken Biber.

Brusil: Well, Ken Biber at one point was at MITRE, I guess before he went to Ford Aerospace, and then certainly Meisner and Hopkins went from MITRE to U-B.

Pelkey: So Ford Aerospace had a network in '78, '79 as well?

LaBarre: Yeah, they were working on that, and the people who were involved in that effort actually split off and became Sytek.

Pelkey: Was there much contact between MITRE and Ford Aerospace?

LaBarre: Yeah, we went out there and we talked with them, exchanged things -- information. They were interested, of course, in the MITRENET CSMA.

Pelkey: They were doing a broadband sort of network? I know nothing about what happened at Ford. Ford Aerospace is a chain of events that I know very little about at this point in time.

Brusil: I'm trying to recall -- didn't we find out at one time that we had a mutual sponsor, that one of the intelligence agencies was funding both MITRE and Ford Aerospace to do roughly the same thing? I don't know whether the agency really knew it was doing it.

Pelkey: So MITRE and NBS and whomever else was involved said: "Wait a minute, this wider forum would be appropriate," with invited people. This was held, again, in Boston?

Brusil: It was in Boston. I can't remember which hotel, but it was in Boston.

Pelkey: How many people attended this?

Brusil: I'd say it was the order of 200 to 300. For sure 200; whether is was 300 I can't remember.

Pelkey: Do you know if there is a list of people who attended that some place?

Brusil: Probably long since gone. I did see a list at some point. I can't imagine that the co-editor there, Rob Rosenthal, would have kept the list either.

Pelkey: What happened at this conference? Did both of you attend this? What was it like?

Brusil: Yes.

LaBarre: Yes.

Pelkey: What was the mood like at this? Was there anything of significance?

LaBarre: I think it was just informative, in terms of the papers that were being presented. I don't recall any --

Brusil: I don't recall any particular excitement, other than my impression that there were vendors who were listening very closely, and that very shortly after this, all of a sudden you start hearing companies' names being announced and product intentions being announced. So it was almost a crystallization of the reality of the need for local networking.

LaBarre: Of course the fact that MITRE was participating in this and MITRE's known association with the DOD and government projects, there was probably some anticipation that, out of this may come something that would appear in RFPs for government acquisitions, and I'm sure these companies were well aware of that.

Pelkey: I'm scanning the index here. This issue of protocols and the upper layers -- what was to become TCP/IP and ISO and so on -- it's not obvious, when I look at these sessions, that that was covered at this meeting in May.

LaBarre: No, at that time, there was not a lot of work on upper layer protocols, except for what Xerox had done --

Pelkey: Or ARPA had done; what Vint Cerf had started at Stanford.

LaBarre: Right, but TCP hadn't been invented.

Pelkey: Actually, TCP was probably in Revision II at that point.

LaBarre: 1979?

Brusil: Yeah, I thought it was kind of mid '70s.

Pelkey: Surfaced in '76 --

LaBarre: I guess he hadn't changed over the Arpanet yet.

Pelkey: Right, that came in '81.

LaBarre: But the final version of TCP -- TCP was being worked on, but the final version, the way we know it now, wasn't.

Pelkey: In fact, I think it had already been split. I think it was already becoming TCP/IP in '79.

LaBarre: Vint would know.

Pelkey: I've interviewed Vint. Your recollection is that, looking back on it, all of a sudden there was this that kind of coalesced things, and then all of a sudden there was this flurry of announcements of companies about to be started. Were there more of these after this first one?

Brusil: Certainly not hosted by MITRE and NBS.

LaBarre: I thought there was a combined one in 1980. Or was that when it changed into an IEEE conference.

Brusil: I'm just wondering if the next one was the kick-off of IEEE 802.

Pelkey: When did 802 start?

Brusil: It certainly wasn't before this. It would have been after this. I remember going to some meetings down at MIT about trying to define traffic characteristics so that they could begin addressing an IEEE solution that would meet those traffic characteristics. That eventually became part of the datalink layer Group, 802.2.

Pelkey: There was what, datalink, maybe physical, and then everything above it. There were going to be three standards?

Brusil: Yeah, a datalink, and something under it, and then the 'jai alai' or something like that --

Pelkey: Yeah, everything above that. And then when Xerox -- when the Blue Book came out and the triumvirate said: "We want to put this -- " they had to put it into standards in order to be able to work with each other, and they had to push for a standard. My understanding is that there was a vote -- it's not clear to me when it was, but it's probably '81, maybe '81, in which you had to have two-thirds of the membership approve, and there were 50 or 60 voting members, and token ring got over half the votes but didn't get two-thirds, and therefore it was really split and they changed the nature of 802 to switch if from being the physical, data, everything else to being Ethernet, token ring, and token bus, because they couldn't get a consensus on one network standard. Does any of that ring a bell?

Brusil: That sort of rings a bell as to how it happened.

Pelkey: Do you know anyone who I could talk to?

LaBarre: Well, the person to talk to about the whole IEEE thing --

Brusil: Maris Graube.

LaBarre: Maris Graube and the chair of the 802.3, Don Loughry from Hewlett Packard.

Pelkey: Is he still at HP?

LaBarre: L O U G H R Y.

Brusil: I remember the guy who was chairing these meetings at MIT was Bart Stuck who at that time was from AT&T. I think he might be his own consultant now. S T U C K.

Pelkey: Is he in New Jersey?

Brusil: Probably.

Pelkey: After this, MITRE, having played a role, after this MITRE wanted to participate in these events and was aware of these events.

LaBarre: Participated in --

Pelkey: But no longer was the leader it had been in creating these three forums and then putting this session together.

LaBarre: Yes, because that was not MITRE's role. MITRE's role was -- we saw that there was a need for these activities to begin, to start the activity, but then MITRE tends to do things on the basis of project funding. Once other people had taken over --

Brusil: Well, we were the catalyst, and the other thing, according to our charter, we can't compete with profit making companies, so it was going against us to be able to continue with

implementations or things like that. Certainly, in terms of the level of effort we could expend, there's no way we could have as many people as a U-B or a Sytek or whatever, on staff doing things.

LaBarre: Part of the motivation is that MITRE wanted to get out of the business of making bus interface units for local area networks.

Pelkey: You wanted to buy them from somebody?

LaBarre: We wanted to buy them from somebody. Unfortunately, when we recommend local area networks to our customers, the only one that was making the interface units at that time was MITRE, and MITRE had to churn out some of these 'prototypes', that really ended up being production things simply because nobody else was making them.

Brusil: I remember that first RFP that went out for Chinese copies of MITRENET, I think it was won by a company in the Washington area, DCC. I can't remember what it stands for, Digital Communications Corp., or something like that, and they built boxes that were identical to our MITRENET boxes.

Pelkey: Ok, so your internal designs were handed over to a company to commercialize them and to provide anybody else who wanted the MITRENET. Whatever happened to DCC?

Brusil: Don't know. I don't think they were very aggressive in pursuing the local networking marketplace.

Pelkey: This was just one of many things that they were doing.

LaBarre: And also, I don't believe -- they didn't really take a hold of the product and look at improvements to it and all. This was a prototype thing that had come out of MITRE, and we're not in the business to make money.

Pelkey: This is a CSMA broadband technology?

LaBarre: Right, and they took -- they were essentially running, on their hardware, were running MITRE software, and MITRE just simply didn't have the resource at that time to put into developing a product out of this thing. So there were some problems with that.

Pelkey: Do you know if there is someone who might have taken the energy that was generated through this and took it either into the 802 or some other -- channeled it into something else?

Brusil: I don't know if Rosenthal did anything with it.

LaBarre: Well, Rosenthal certainly worked with NBS and worked with the IEEE in getting a lot of this stuff, and John Shoch, didn't he work with the IEEE on this?

Brusil: Probably. I'm also trying to think of the role of John Heafner at NBS. He was Rosenthal's boss. I'd say about three or four years after this is when they started having -- there was a kick-off meeting at NBS to get vendors together for the first NCC demo, which eventually led to the Autofact demo a couple of years later.

LaBarre: MAP/TOP.

Pelkey: Oh really, I wasn't aware of this. What was this?

Brusil: This must have been about '82-'83 timeframe. NBS called for a meeting of vendors, saying: "Let's demonstrate that we can build interoperable networking products and we'll take this show to Las Vegas at the National Computer Conference," I think in '83 or '84. I think there were a number of representatives from GM and Ford there, and I think Maris Graube, who eventually became the chair of that, was with Tektronix at the time, I think, and that eventually became the basis of the NBS OSI implementers workshops that are continuing right now.

Pelkey: Who originated that?

Brusil: I think John Heafner.

Pelkey: Is he still at --

Brusil: He's not at NBS. He's currently at DEC, and I believe about ready to jump to IBM down in the DC area.

Pelkey: Is he at DEC in DC?

Brusil: He was a month ago. Whether he's still there -- he's in transition to IBM in the DC area.

Pelkey: I need to track him down then. Is Robert Rosenthal still at NBS?

Brusil: Yes. He's now working in the security area, but he's also the chair of this continuing set of workshops where vendors and users get together and develop implementers agreements.

Pelkey: Is there anyone else from this period of time, or subsequent events, such as what happened with these workshops, someone that you think I should talk to.

Brusil: Certainly, Maris Graube, because he was the guy at this first kick-off meeting at NBS that eventually created the MAP/TOP stuff. The other important spin-off of the NBS work and the implementers workshop, I think Heafner and his colleague -- what the hell is his name -- I'll think of it later. They created the notion that there ought to be a corporation for open systems that will certify implementations of ISO products. They worked very hard for that. They also had the notion that the government ought to band together it's buying power and put together a specification based on ISO standards, and that eventually became the GOSIP, Government OSI Profile, which is currently being honchoed by Jerry Mulvenna down at NBS now, who you can also get to via that same telephone number.

Pelkey: So, going back, these original forums were MITRE. Was that a funded project, to pull together these forums and see what the issues were?

Brusil: I think the security agencies had funded that.

Pelkey: So one of the agencies said: "Why don't you take on this project of going out and finding out what's happening in LAN and what the issues are?"

Brusil: They had some networking needs that they wanted to have solved, and I guess this was part of trying to find a solution.

LaBarre: Carl Sunshine, that's another name that pops up that was at those meetings.

Brusil: Yes. He's with Unisys.

LaBarre: And Ken Biber. He's now with Unisys. I have Carl's number here…

Pelkey: We're impressed.

LaBarre: Don Loughry at Hewlett-Packard

Pelkey: I thank you both. Given that what I'm writing about in data communications in a larger sense -- I'm also writing about modems and multiplexers and X.25 and T1 -- were there any activities that you're aware of, intellectual property that came in any of those areas?

Brusil: No, I certainly wasn't plugged into that community.

Pelkey: When did MITRENET first get implemented?

LaBarre: Well, we had versions of MITRENET in '72, slotted MITRENET.

Brusil: Which eventually became Applitek. The MITRE developer was Ash Dahod, and he left and became president and CEO of Applitek.

Pelkey: When did that happen?

Brusil: He must have left in the early '80s. I thought it was subsequent to this meeting. He's one of the authors here. We'll find out.

Pelkey: When did it go from slotted to broadband?

LaBarre: Well, this was slotted on broadband?

Pelkey: So when did it go CSMA?

LaBarre: We just opened up another channel. We still used the slotted for quite a while. This went to CSMA I think it was 1976, '75. Greg Hopkins had some things running on there.

Pelkey: How did you guys come in contact with the ideas of Metcalfe?

LaBarre: Well through the literature they produced.

Pelkey: But his paper wasn't published until '76. His thesis had been.

LaBarre: Well, his PhD dissertation was one source, as well as, through the years, Tobagi, Lam and a number of others, their dissertations. That brings up another person that was there, the author of all these queuing theory books, Len Kleinrock.

Brusil: What about Watson – from Lawrence Livermore?

LaBarre: That's right. These people were also at these forums.

Pelkey: I should stick around here for a couple of days, you'll think of more people.

LaBarre: As a matter of fact, Watson and Fletcher's algorithm on CSMA/CD, their timer-based one --

Brusil: Got incorporated into our MITRENET design --

LaBarre: Which is incorporated and currently being used for the link level on our MITRENET right here. Nobody uses it commercially right now, but it still works after all these years, what 10 years. It was put in the House of Representatives at the time.

Pelkey: The MITRENET, the CSMA version, other than for having contracted it out to the DCC, it never really did anything other than that, whereas the Applitek got spun out of the slotted --

LaBarre: Well, Ford Aerospace essentially took the concept that we had and put it on broadband. Ford or Sytek.

Pelkey: Sytek came out of Ford Aerospace, and Ford Aerospace picked up what you had done in terms of CSMA.

LaBarre: They had a lot of stuff there. They certainly enhanced it far beyond what we had done. They made a product out of it.

Pelkey: I have no other questions.

Brusil: I'm just amazed at how many companies got spun out of our group here.

Pelkey: It's amazing when people start to think about where ideas come from.

LaBarre: Steve Dunston --

Brusil: He was also part of that Applitek crew.

LaBarre: Branford Branston --

Brusil: See the faces but not the names, right.

LaBarre: These are people that went off to work with the smaller venture companies.

Pelkey: Did venture capitalists come out here at that point in time and try to get people out of here? Or was it more the initiative of a person going out?

LaBarre: I believe Greg Hopkins might have been recruited.

Brusil: I think they had already formed the corporate entity, U-B, and then they came after Hopkins and Meisner.

LaBarre: You said U-B had already done Ethernet, baseband. They were looking to get into broadband areas.

Pelkey: So they were looking for some people who knew something about broadband, and they came here. You had been the source of it. The first broadband implementation was here. Thank you very much for your time.

LaBarre: [Leafing through some papers] These are the local area network conferences put on at the University of Minnesota, CDC Corporation was involved in that. Bill Franta and all these people have been doing a lot of work in that.

Pelkey: Is he still there?

LaBarre: I don't know. He may still be there. They held, for a number of years, local area network conferences. As a matter of fact, they held one last year. Bill Franta's local area network conference.

Brusil: Oh, in Minneapolis. But that started after this effort. They essentially carried on what we had started, in terms of conference on local area networks.

LaBarre: I think Harvey Freeman was an organizer of that conference series.

Pelkey: Is he at Minnesota now?

Brusil: He used to be with Architecture Technology. I don't know if he still is.

LaBarre: Dick Watson.

Pelkey: You're just a flood of names now.

END OF THE INTERVIEW

