

The IBM PC and IBM's Token Ring LAN 1981-1982

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Chapter 10 - Networking: Market Competition 1981-1983

10.6 The IBM PC and IBM's Token Ring LAN 1981-1982

Other histories will reconstruct the decisions and actions within IBM leading up to and following early 1980 when executives realized IBM needed to sell a personal computer. Their customers were asking about them and clearly planning to buy desktop computers, if only for spreadsheet use. Competitors were entering the market like Xerox that had introduced a Z-80-based Xerox 820. IBM executives also had heard the rumors about Xerox's Alto and were shocked to see television advertisements extolling the promises of their Star computer. Then there was Exxon buying up companies, such as Zilog and InterCom, to make an assault on the office market. The demand for personal computers was growing rapidly: witness Apple's anticipated IPO in December, 1980. The Corporate Management Committee (CMC) and President John Opel assigned William Lowe the task of recommending a course of action. In July 1980 he reported:

The only way we can get into the personal computer business is to go out and buy part of a computer company, or buy both the CPU and software from people like Apple or Atari – because we can't do this within the culture of IBM.⁴

Concurring, but strongly preferring to sell their own computer, not one of another manufacturer, Lowe and a dozen engineers he assembled were given a month to come up with a prototype design. They first contacted a number of potential suppliers and decided to use the Intel 8088 over the Motorola and Zilog microprocessors, and Microsoft's operating system over that of Digital Research's. They also made the PC open just as had Apple. IBM entered the personal computer business leveraging external economies rather than doing everything internally as had done successfully with the System/360.

Then that fall of 1980, IBM executives saw Xerox television ads on Monday Night Football announcing the benefits of its new computer system, the Star System 8000, interconnected with an Ethernet LAN. They wanted to know what IBM's response would be. They drew a blank. So another task force was organized just as had been done to strategize for the personal computer.

Daniel Warmenhoven, a task force member, remembers why IBM selected token ring:

I remember the meeting well. One of the recommendations was we just adopt Ethernet. And the answer came back 'We can't do that, because you can't be an industry leader by following somebody else's implementation.' And at the time it was already pretty clear that DEC was getting very closely aligned – it wouldn't be so bad if it was Xerox only, but having DEC in the fray, that was like a declaration of war. I mean, the Axis Powers had formed, and IBM had to have a different solution, so the alternative was to pick the token ring.

The IBM task force was to learn its Zurich laboratory had been working with token ring technology ever since 1977.⁵ MIT Professor Jerry Saltzer, who we have observed was very familiar with token ring, remembers:

I spent the year of '77, '78 working for IBM. I was working in White Plains, but I traveled a bit, quite a bit, and one of my stops was in Zurich, and I discovered that they were interested in token rings there, so we proceeded to compare notes, and I basically supplied them with every piece of input that we had learned.

As to why IBM selected token ring versus getting involved with Ethernet, Saltzer opines:

I have a feeling that the Zurich laboratory was trying to figure out could it do something useful in the area of local area network communications. Ethernet basically was something that was being done 5,000 miles farther away than a token ring, or a ring of any kind. They came across the Cambridge Ring almost immediately because they see lots of people from Cambridge. It was harder to look at the Ethernet because no one had published anything on it yet. You know, you would just hear, in conferences or you would hear in various places that the people at Xerox PARC, and Xerox PARC is a competing company, you can't get inside to look at it. They hadn't published anything on it yet, so they began looking at rings, and that's probably the reason. I don't remember any specific reason given. On the other hand, what I found when I got there was that they agreed with me, that if you were to start off with a completely free slate, no history behind you of any kind, and ask yourself which is intrinsically better, the Ethernet or the token ring, I believe the answer is the token ring. And I think that because they happened to have begun working in that area, they quickly came to that same conclusion themselves, that it's got some fundamentally superior properties.

Warmenhoven remembers those three months of October to the end of the year when the token ring plan, a resource definition in the terminology of the day, had to be completed so funding of the project could begin in 1981. Warmenhoven, who reported to Murray Bolt, remembers:

Murray and I were probably the key architects of what I would consider to be three fundamental elements in this thing. The first one is that it had to be a structured system, so even though it was a ring, it was going to be a star wired system. It was going to model the phone systems. It started off with passive concentrators, but the whole cabling system and everything was kind of a star. The second one was that it would not be single ring, it would be a full mesh, and it would be strictly peer-to-peer across the mesh. Now, at the time, SNA was mainframe polled, and so here's your first anathema at IBM, that it's not mainframe centered. It is totally distributed. The third element, and this is really an interesting wrinkle, it had to be available for non-IBM device attachment, and this was another anathema at IBM. This leads to the conclusion you want the chip set available in the semiconductor merchant market. Murray, basically, I think, more than anybody else, made the decision that he was going to get the chip set designed by one of the major semiconductor manufacturers. The three big candidates were Intel, Motorola and TI.

The task force members were aware of the PC plan now in progress and that Don Estridge of the Entry Systems Division (ESD) had responsibility for the PC project. Again, Warmenhoven:

So the organization had formed and we knew it was off and running, but we all kept thinking it's going to be smart workstations and minis.

On August 12, 1981, IBM introduced their IBM PC. It is a moment of historic importance. IBM had not introduced the first personal computer. In fact, they were reacting to the fear of being late again as they had with minicomputers. From the IBM press release of that day:

This is the computer for just about everyone who has ever wanted a personal system at the office, on the university campus or at home," said C. B. Rogers, Jr. IBM vice president and group executive, General Business Group. "We believe its performance, reliability and ease of use make it the most advanced, affordable personal computer in the marketplace.

No expletives sounding a new day. No grand vision of the future. Simply another routine press release.

The IBM PC may have been state-of-the art for the times, but most importantly it bore the imprint, and approval, of IBM. It became possible for the personal computer to be adopted within major corporations, most of which had up to then organized their MIS, i.e. computing, assets in essentially one or a few locations. The minicomputer had penetrated only the periphery of large organizations, such as branch, or division, operations. So the idea of computers on desktops seemed, well impossible, to understand. Yet in a few years, the very idea of IBM's long-standing vision of Host centric computing would come under question.

The token ring that would be the LAN to counter the marketing efforts of companies selling competitive LANs was not as easy to accomplish as was the PC: it required coordinating and working with many different interest groups within IBM to secure their agreement to make a token ring available. As for the efforts to select a merchant chip manufacturer, by year-end 1981, after nearly a year of investigation, IBM decided to work with Texas Instruments (TI). Nearly another year was then spent negotiating the design of the chip(s). On September 16, 1982, IBM and TI made known their intentions to develop integrated-circuit chips for an IBM “local area network.”⁶ The article further confirmed that IBM was using the “token-passing” technique.

Warmenhoven remembers a meeting with TI managers shortly after the public announcement:

As I recall it, the contract got signed in roughly the first of December of '82. Now, I remember the meeting. TI came in probably ten days after the contract was signed, and said they were off the schedule by a year. I mean, they may have started the discussion ‘We’re off by up to six months,’ but by the time you get into it, it’s off by a year. And, from their perspective, they felt as though the specs had changed, all kinds of other things had gone on, but from our perspective, we had signed a contract ten days ago – I’m not sure it was exactly ten, but some very short period ago – and all of a sudden you realize that the dates you committed to, within less than a full moon, are off by 50%.

Token ring was suddenly looking like a 1984 product not a 1983 product, a prospect that did not look acceptable to ESD’s Estridge.

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