

TRIP REPORT: EUROPE, 8 JUNE - 25 JUNE, 1981
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This note reports observations while on the following itinerary:

- June 8-11, M.I.T. Industrial Liaison Program Lectures in Zurich, Switzerland
- June 11, visit to ETH Zurich.
- June 12, visit to IBM Research Laboratory, Ruschlikon, Switzerland.
- June 15, visit to INRIA, Le Chesnay, France.
- June 15, visit to CNET, Issy les Moulineaux, France
- June 16, visit to CII/Honeywell Bull, Louveciennes, France.
- June 18, visit to Olivetti, Ivrea, Italy.
- June 19, visit to CSELT, Turin, Italy.
- June 22-25, NATO meeting on tactical airborne distributed computing and local networks, Roros, Norway.

Each stop is discussed in turn:

1. The ILP lecture series on Personal Computers, Local Area Networks, and Office Automation given for four days in Zurich seemed to be a resounding success, with an audience of about 55. Most attendees were data processing executives or technical managers trying to learn about this new area. It seems likely that the series, with some debugging, will be held again.
2. In Zurich, I visited Niklaus Wirth at Eidgenossische Technisch Hochschule Zurich, where I saw a demonstration of "Lilith", an Alto-like personal computer developed by Wirth. (It uses 2901 bit-slice architecture with microcoded support for a Modula compiler.) This project looked just like most other such projects (e.g., Kayak, Nu, etc.,) somewhat behind Xerox. A Xerox Ethernet will be used to interconnect; no services are currently planned, though they are discussing a printer service based on a Canon printer. He gave me a recent (April, 1981) paper describing Lilith.

3. In Zurich, I had a brief visit to the IBM Zurich Research Laboratory, where Philippe Janson was my host. I saw a demonstration of the 4 Mbit/second Z-ring network, which will be documented in four papers at the International Symposium on Local Networks in Florence, Italy, in April, 1982. Janson also described preliminary ideas on a name server for their local network and distributed system research. Liba Svobodova will spend the month of July at this laboratory.
4. I visited the Institut National de Recherche en Informatique et en Automatique (INRIA) at Le Chesnay, near Paris, where Gerard LeLann arranged my schedule. Discussions there centered on two research areas:
 - 1) The team that was working on the Sirius Pilot project (Distributed Data Bases) is now deciding on the direction of the next Pilot project. Four ideas are under consideration by LeLann, all in the area of real time distributed systems:
 - Automated manufacturing, perhaps with Renault or Peugeot
 - Airborne distributed systems, perhaps with Dassault or SNIAS
 - Automatic traffic control, with the ministry of transport
 - A personal communication computer, to be done with CNET.In addition, another of the Sirius team, M. Gardoni, is proposing a Pilot project for a multi-micro database machine.
 - 2) Nadjah Naffah demonstrated Kayak, another Alto-like computer with a 1 Mbit/sec. Ethernet, high resolution display, etc. When asked about longer term goals, he spoke of building a knowledge-based forms handling system, and he mentioned the idea of a virtual data management terminal. Each of these things seemed a bit vague; the basic charter is office automation.
5. Near Paris, I visited with Louis Pouzin of the Centre Nationale d'Etudes Telecommunications (CNET), the French Bell Labs. He described several Pilot projects about to be initiated by CNET.
 - Software engineering for the programming of telephone exchanges.
 - A high-speed packet switch using a packet-managed interoffice signalling system.
 - Interconnection of new services, such as word processing local networks using the public data network.

The group that is initiating these projects is just getting started now, so it will be sometime until any results appear.

6. In Paris, I visited CII-Honeywell Bull, where I had a pleasant lunch and gave a talk to a small audience, but I learned very little. They apparently have almost no activity in local networks or distributed computing at this site. Grenoble is the center of this activity.
7. A visit to the Olivetti Corporate Systems Research Center at Ivrea, Italy, provided a very busy day. Mr. Guerrino De Luca acted as my host. A few months ago, Olivetti combined all communication and network activities into a new subsidiary named Olteco. Olteco works mostly on long-haul networks, and it has an agreement with Bolt Beranek and Newman under which Olteco sells packet networks using C/30 IMPs as forwarding nodes. Olteco's biggest customer is a Danish bank with 1500 minicomputers and 5000 terminals; the Danish X.21 switched data network is used for interconnection.

While there I saw a 10 Mbit Ethernet transceiver built by Olivetti, which uses a reed relay to cut the transceiver off the cable if anything goes wrong, somewhat like our ring relay cutout. At the time they were commenting about some failure of the transceiver they had purchased from 3COM to meet specifications. They couldn't look inside the transceiver to find out what might be wrong, because 3COM potted it in plastic resin. They gave me a sample of their Ethernet cable, which has two foil shields and two braid shields claimed by them to be necessary to meet the Ethernet specification. They are working on enchiping their transceiver (2 chips) and are just now starting design of a non-link repeater to Ethernet specifications.

Olivetti is seriously investigating the idea of using an Ethernet as a voice PABX with up to 100 lines. They are building A/D convertors for an experiment in which one corner of a Northern Telecom SL-1 PABX is reimplemented with an Ethernet. We discussed the likely problems when a government P.T.T. is asked to certify a PABX that is non-blocking, but where speech quality goes down above a certain trunking level.

8. In Turin, Italy, I visited the Centro Studi E Laboratoria Telecomunicazioni (CSELT), which functions as a kind of Bell Laboratories for the (private) Italian telephone company. A Dr. L. Sacchi hosted my visit and scared up a polite audience for discussion, but only one corner of this organization was much interested in our work. A subsidiary company, named Selenia, sent a Mr. Luigi Malavesi from Rome to the discussion, and he described an optical Ethernet arranged in a Z configuration so that the delay time between the transmit and receive port of a transceiver is the same for all stations. This is still a paper project, and it was not clear when they hope to try to build one. It was apparent that Selenia, in Rome, would have been the most appropriate piece of their organization to visit.

9. The last point of my itinerary was a small, four-day meeting on "Tactical airborne distributed computing and local networks," held in Roros, Norway, about 250 miles north of Oslo. This meeting was sponsored by the NATO Advisory Group for Aerospace Research and Development, and it attracted about 100 people from the defense avionics business (government and industry) of the NATO countries. The gap between hardware in the field and current technology was apparent, and the whole area of avionics seems to be struggling with how to match yearly changes in technology to an avionics procurement pattern that traditionally involves five years of development followed by 15 years in the field. A typical worry is whether or not replacement M68000 cpu chips will be available 19 years hence. The "local networks" part of the avionics interest is currently manifested in a MLD-STD-1553A, a 1 Mbit/sec. centrally controlled bus that appeared in practically every system description. "Distributed Computing" in this area involves having several program-specialized real-time processors, each handling some task such as flight control, navigation, instrument display, electronics counter measures, or weapons deployment. Very little stored data is involved, so reliability measures do not involve transactions, duplicate data, etc., but rather multiple paths for data streams, multiple sensors and processors. There was a difficult-to-bridge gap between the five academic papers and the 30 reports from the field, though the two groups were obviously straining to learn from each other. From my experience, it would be a good idea for more academics to attend future conferences of this type, to improve mutual understanding.