

The connection of Italy to the Internet

Luciano Lenzini tells the story

At the end of the 1970s DARPA (Defense ARPA) decided to extend the experimentation of the TCP/IP protocol, under the guidance of Robert Kahn, to European research institutes with significant experience in the field of networking. At that time, the Internet connected many university, research and military centers throughout the USA.

I followed the various events related to the research on the TCP/IP protocol for some time, as part of my studies on networking that I was doing for CNUCE. With the RPCNET and STELLA projects we had gained a remarkable reputation and international visibility regarding this area, as well as an excellent technological know-how. The experience of connecting to the Internet, which was rapidly establishing itself as a dominant model thanks to the considerable investment of the Americans, was a natural outlet for our research.

Three colleagues with whom I was in touch at the time told me of DARPA's decision: Peter Kirstein of UCL (University College of London), Mario Gerla of UCLA (University of California at Los Angeles) and Luigi Fratta of Milan Polytechnic, who at that time was at UCLA for a study period. All three encouraged me to participate in the experiment, pointing out in particular the benefits that the Italian scientific world would have derived from the connection. In those years, among experts, we thought that research on networks would bring about not only better direct communication for the academic world, but above all the possibility of making the most of the potential of computer centers located throughout Italy, at the universities and the CNR institutes. This was the stimulus that prompted me to ask the top management of the institution for the go-ahead to participate in the trials.

After making the necessary verifications with Gianfranco Capriz (Director of CNUCE) and Giuseppe Biorci (President of the CNR General Information Commission, who managed the budget for the provision of the scientific calculation of the CNR), on February 12th 1980 I wrote a [letter](#) to Bob Kahn asking to include CNUCE in the list of European experimenters. He immediately and enthusiastically said yes. We were included in the project as pioneers, along with the University College of London and the NTE Research Center of the Norwegian Telecom.

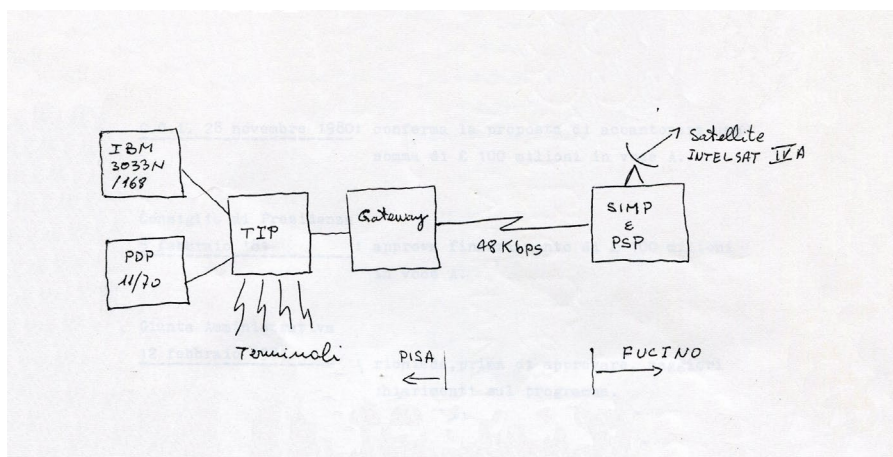
What on paper seemed a straightforward and obstacle-free path in reality proved more complicated than expected. Even if CNUCE joined the program in 1980, the real implementation of the project, that is the first effective connection to the Internet,

took place only six years later, April 30, 1986. The delay cost us a position. We started third, but we arrived fourth, because Germany connected before, although joining the program after us, through the DFVLR (West Germany Space Agency). Some episodes, in particular, can help to understand the difficulties encountered and the enormous delay that built up.

There was a good deal of work to do to "switch on" a node on the Internet. First, I organized a meeting of Bob Kahn with the members of the General Commission for Computer Science of the CNR. This was to convince them of the strategic importance for Italy of joining this experiment. The meeting proved fruitful: the CNR gave us 510 million lire, a good sum for those times.

During a subsequent visit by Bob Kahn to the CNUCE, in the autumn of 1980, we worked together on the configuration of the node. The USA had decided to use the SATNET (SATellite NETwork) to extend the experimentation of the Internet in Europe. Each nation had to provide the Internet connection through the geostationary satellite "Intelsat 4". This was positioned over the Atlantic ocean and was able to illuminate, with its antennas, Europe and the east coast of the USA. In Italy, the satellite was operated using a 35-meter parabolic antenna located at the Telespazio del Fucino station.

Together with Bob Kahn we designed a scheme that included two devices, the PSP (Packet Satellite Processor) and the SIMP (Satellite IMP). These were to be installed under the Fucino satellite dish and connected to a mini computer provided by Digital sited at CNUCE, to be used as a gateway. The figure below summarizes the configuration of the node. It is noteworthy the 48 Kbit/sec line (a very high speed at the time) between the CNUCE of Pisa and the Telespazio antenna pointing towards the Intelsat geostationary satellite. The satellite enabled communication between European and US experimenters. The PSP and the SIMP, highlighted in the figure, implemented the operations of the satellite network known as SATNET. The document [RFC 834](#), dated December 1982, entitled "Who Talks TCP?", officially proves that the Fucino station was already equipped with IP addresses in 1982, although we don't know for how long.



At this point it was time to convince the Italian Defense authorities, the SIP, Italcable and Telespazio at the same time. The problem was not about technology, but about a strategic vision for Italy. It took about three years to get everyone to agree, as shown by [the experimentation contract](#), signed on August 22nd 1984. I was young, full of enthusiasm and dreams, and such a great obstacle that required so much energy to overcome didn't scare me one bit.

As soon as the contract was signed, I activated the procedure for obtaining the equipment needed to configure the node. Almost another year went by before the CNR authorized the purchase of the hardware. We were ready to proceed when a letter from DARPA dealt us another blow, which risked knocking us out for good. More or less it said: "All SATNET installations must be equipped with a new gateway in order to proceed with connection testing". It was the mythical Butterfly of the BBN, 256 processors connected in a butterfly network, without doubt more expensive than we had been expecting. At first I was dismayed. I had to change everything but above all start the bureaucratic process from scratch. Even if I had convinced the Rome CNR to grant us additional funding, I was risking another year and in the meantime the technology was likely to change yet again.

I said to myself: that's it, I give up - even if I started this project myself, even though I've dedicated six years of my life, I'm dropping out. I talked about it straightaway with the Director of CNUCE, Stefano Trumpy, who, like the previous Director Prof. Gianfranco Capriz, had always supported me. Instead of sending a message to communicate my decision, I decided to inform the members of the [ICB \(International Cooperation Board\)](#), the group that planned Internet activities in Europe, with whom I had already established a friendly relationship. For the following days an ICB meeting was planned in Washington DC and I decided to go and report the bad news in person. But it was then that an incredible thing happened.

When it was my turn to take the floor, I intervened with a certain embarrassment: "Unfortunately for us the adoption of the butterfly gateway swells the project even more, so I don't feel like moving forward." There was a long silence. At that point Bob Kahn declared a coffee break and during the break I saw him arguing in a corner of the room with Vint Cerf. When the meeting resumed, Bob addressed me with these words: "Luciano, we want the CNUCE to be there, the Butterfly will be financed for you by DARPA". I was over the moon, the Internet would really arrive in Italy despite all the difficulties and bureaucratic obstacles. It was a true victory.

In parallel with my activity, around 1985, my colleagues Blasco Bonito and Marco Sommani had already begun to adapt the software, implemented by the US researchers, to the specificities of the CNUCE hosts. They were involved in solving several problems

before getting the software to function well. In short, it was not at all a plug and play operation!

All these events involved only the people who were part of the group that were working on the project, as is normal. I still remember that a few days after the April 30 connection [I wrote a letter to the President of the CNR](#) to inform him of the success of the project, but there was no answer. This was no surprise to me at all, given that an organization like CNR manages innumerable projects in different sectors of research and experimentation on networking was only one of the many activities that were carried out in those years. No one at that time could have really grasped the potential of the Internet project, which even through my enthusiastic eyes seemed "only" a very interesting evolution for the scientific world and for computing centers, but nothing more. I imagine that the President, on reading the letter, thought pleased: "Pretty good stuff from these Pisans!", and then went on to peruse the next letter, forgetting about our project.

Two years later, though, I saw the President at the CNR headquarters in Rome. I remember it very well. He saw me from across the room and greeted me joyfully: "Luciano!" He had just come back from the United States, he told me, and had seen "a very interesting network": the Internet. "We need to connect up right away!" I understood then that my letter of 1986 had not remained in his memory, but I was happy to be able to tell him that our institute, and with him the CNR, was already connected.

Not only was the internal communication a real disaster, but even [our attempt to get the news out to the press](#) fell on deaf ears. We tried to send a public statement to the news agencies, but no newspaper took it up. More attentive than the national press was [the "Federigo Enriques" Scientific High School](#) in Livorno. Miria Gambis, teacher of mathematics and physics, on 3 December 1987, organized for her students a demonstration of the potential offered by the Internet by connecting the high school with the CNUCE Institute. The students, there in large numbers, were able to watch emails from their high school to the Universities of Wisconsin and Stanford. The almost immediate response to the email was greeted with great enthusiasm, followed by a long and thunderous applause. The students for the first time savored the idea of being able to talk with the whole world and with the greatest freedom possible.



This small but significant episode was followed by a “radio silence” that lasted thirty years. It was a period during which the Internet headed off on a never ending massively successful journey, but with no one remembering that pioneering operation of the Pisan researchers, thanks to which the experimentation had arrived in Italy. This *damnatio memoriae* was interrupted only on the 26 May 2006 by the University of Pisa, which, on my proposal, gave Vint Cerf and Bob Kahn [Honorary Degrees in Computer Engineering](#).

One of the first effects of Italy's connection to the Internet already came about the following year, in 1987. This was when Italy, thanks to the first nameserver installed by Blasco Bonito at the CNUCE of Pisa, was integrated into the world domain name system with the suffix .it. From that moment on, every Italian Internet resource officially joined the global Internet and was registered by the Network Information Service, the first nucleus of what is now the .it Registry.



Commemorative plaque for the Italian Internet Day (thirtieth anniversary) - 29th of April 2016
From left: Antonio Blasco Bonito, Maria Chiara Carrozza, Luciano Lenzini, Marco Filippeschi,
Massimo Mario Augello, Domenico Laforenza

On 29 April 2016, the thirtieth anniversary of our “enterprise” was celebrated and the Italian public finally got to know the story and the people who made our country's Internet connection possible. The celebration of Internet Day took place at the CNR research area of Pisa in the presence of the highest national and regional political, institutional and scientific authorities. And Italian national TV, broadcasting to millions of people and schools, distributed the news throughout the country. A documentary film, [LOGIN](#), was also dedicated to our story and broadcast by RAI 5 on the evening of 29 April, written by the journalist Riccardo Luna and directed by Alice Tomassini. Moreover, the morning of 29 April, at the site (Via S. Maria 36) of the former headquarters of CNUCE, a commemorative plaque was inaugurated to remember the day when Italy became part of the Internet.