Early adoption of Unix,TCP/IP and the Internet in aid to research in mathematical physics.

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The pioneering use of computer tools such as Internet, Unix and open source software
since the mid-eighties, in the group of mathematical physics of the Prof. Tirozzi,
 one of the first experiences in Italy, anticipated their widespread use in the next decade, ...

Computer tools used by 1986-1989
in the research group of Prof. Tirozzi

- Workstations SUN-3 e SUN-4
- Unix OS and TCP/IP LAN
- Internet : telnet, ftp, smtp email, dns, gopher, usenet news, irc
- Opensource: GNU software, GCC, Core Utilities, Binary Utilities, Bash Shell, Lisp, Maxima...

The first Internet domain name registered in University of Rome: unirm1.it,
few years later replaced by the official domain uniroma1.it

Among the early experiences of these technologies in Italy
10 years before their widespread use in private companies
and the public at large

I had the fortune and honor to install this systems and play for a few years
the role of system administrator (1987-1992),
along with the colleague Paolo Branchesi.

Research projects on mathematical physics,
neural networks (Tirozzi),
computational algebra (Procesi)

No IBM mainframe or minicomputer VAX / VMS,
proprietary technologies, at the time the most used

Workstations SUN, Open Standards, Network Computing

These technical choices were revolutionary at that time
It was not clear the importance of open standards,
Open source movement had just been born
and were preferred proprietary solutions (IBM, DEC, Microsoft)

SUN = Stanford University Network
1982 Spin-off by Stanford researchers Bechtosleim, McNealy, Khosla, and Bill Joy (UC Berkeley)

SUN-3 based on CPU Motorola 68020 , with 32-bit ALU (arithmetic logic unit) and MMU (Memory Management Unity), to support Virtual Memory

LAN with a central server and few diskless client and X-terminal

Few years later replaced by SUN-4, RISC SPARC CPU
Operating System: SunOS Unix, derived by BSD (Berkeley Unix)

Compiler and base software opensource:
- GCC C compiler, GNU Common Lisp, Emacs editor and so on...developed by R.Stallmann, MIT and FSF (Free Software Foundation)

- Maxima, derived by 1982 computer algebra system Macsyma (father of Mathematica, Maple,....),

Installed with the collaboration of main developer:
Prof. Bill Schelter (1947-2001, R.I.P.) , Un.Texas at Austin, visiting University Of Rome in those years

We want remember Schelter's works on noncommutative ring theory, computational algebra, automated theorem proving, AKCL, GNU Common Lisp, Emacs, Maxima first port of the GNU C to the Intel 386 architecture, used in the original implementation of the Linux kernel,

TCP/IP Local Area Network , the protocol suite for world-wide fully interconnected packet switching networks, the Internet

Next Step ==> Link to NFSNet (US National Science Foundation Network) and other research networks, the Internet in those years

The first italian node was at the Italian National Research Council Pisa.
University of Rome did not have an internet domain, and did not think of it

For this we have configured the DNS software on SUN workstations and registered the domain
unirm1.it

For the first connection outside of our network was configured a bridge DECnet / TCP on HEPnet (High-Energy Physics Network), a network based on proprietary protocols of Digital Equipment, and Vax/VMS nodes.
Link between two workstations DEC Ultrix (brand name for DEC Unix), one in INFN Rome and in one FermiLab , Batavia (Illinois).

Around 1990 became available the first GARR backbone
GARR = Gruppo per l'Armonizzazione delle Reti della Ricerca
the Italian national computer network for universities and research

CDN 2 Mbits/sec (E1 digital link) + router Cisco AGS
Roma, Ginevra, Pisa, Bologna, Milano, Bari main nodes

At the time it was not yet clear to GARR that the future was the Internet protocols, Then were more used Bitnet or Decnet, while governments pushed OSI X.400.

The connection was shared between 4 protocols, with TDM, Time Division Multiplexing 512 Kbit/sec for channel:

1. IBM SNA, proprietary protocol
2. Digital Equipment DECnet, proprietary protocol
3. OSI protocols, ITU and government standards, X.25, X.400,.
4. TCP/IP, Internet protocols

A few years later it became clear that our choice was the right one, and other network protocols disappeared
giving way to the boom of the Internet.

Among the services that were provided from the beginning with our Internet domain:

- SMTP Email, now is the standard.

- Usenet is a worldwide distributed Internet discussion system, developed from the general purpose UUCP dial-up network architecture.
Users read and post messages (called articles or posts or news) to one or more categories, known as newsgroups.
Usenet is the precursor to web forums that are widely used today.

- Internet Relay Chat (IRC) a chat server to transfer text message, real-time.
Group communication in discussion forums, called channels, one-to-one communication via private message as well as chat and data transfer, including file sharing,
A precursor of instant messaging and social networks

Installed with the help of a young german computer scientist: Carl von Loesch (Lynx)
Only two nodes in Italy: Rome and Politecnico Milano.

- The Gopher protocol is a TCP service designed for distributing, searching, and retrieving documents over the Internet.
Gopher and WAIS was the fathers of NIR,
Network Information Retrieval

The Gopher protocol was strongly oriented towards
a menu-document design and is the effective predecessor
of the World Wide Web.

- The first www server will be installed in this network in early 1993, when I had just moved from Univ. Of Rome to Univ. Of Genoa.

- In 1992 we started to use GNU/Linux, the open source OS, by downloading on SUN ftp server the first complete distribution, Softlanding Linux System (SLS), which later became Slackware

Thanks to my coworker
Paolo Branchesi (1965-2010, R.I.P.)

Died too early for a heart attack during an motocross trial through the Sahara desert,
running on a motorcycle in the dunes near Douz (Tunisia).

Thanks to Carl von Loesch for working on IRC
Bill Schelter for working on Maxima

And of course,

Thanks to my teacher Brunello Tirozzi

We are all here for him

The group almost complete, at a graduate of one of its component