http://www.computerworld.com.pt/2013/05/22/de-putos-de-sandalias-a-pais-da-ethernet/

De putos de sandálias a pais da Ethernet

May 22, 2013 at 14:46:47 by Computerworld

Dave Boggs and Bob Metcalfe invented the ether network to interconnect computers in the center PARC, Xerox. At one point they discussed whether there would be somebody one day, the need for bandwidth of 10 Mbps ...
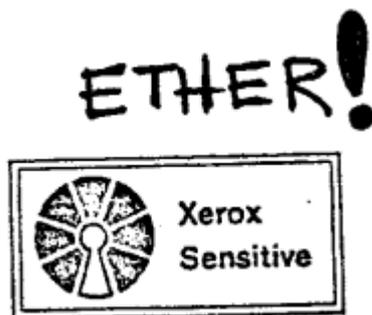
Bob Metcalfe, Dave Boggs and the rest of the scientists of the Xerox Palo Alto Research Center (PARC) in 1973 were very similar to young programmers and entrepreneurs in Silicon Vallley today. "We wore beards, sandals, jeans, t-shirts," Metcalfe said this month.

The university professor remembered the look that he and his colleagues had and the clothes they wore when they were working at the center installed in modern buildings - but amid the suburban fields, 40 years ago. At that time Metcalfe was 27.
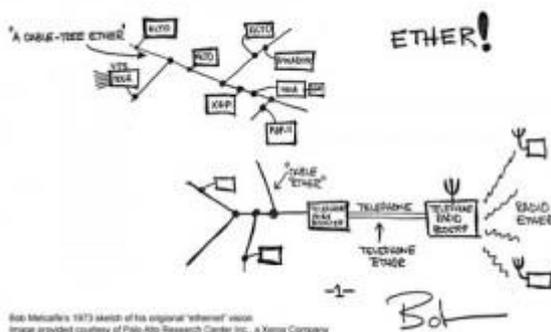
"I wore a big red beard," says the researcher, now white-haired. When he and his colleagues moved to to the main conference room of the PARC, heading to a meeting, went to sandals and sat in chairs shaped ottomans. And, as a startup, furniture disguised informal surroundings intense. "Normally we worked night and day," he says.

The proto-"geeks" in Silicon Valley even had internet after Metcalfe have assembled a connection after arriving at PARC in June, 1972. At that time, was still in the initial state that was called Arpanet, through which researchers at PARC and other institutions could connect to other computers over long distances.

Facebook and videos on Netflix and even the Web were many years away. The "staple" of modern Internet require a network much faster.

Start with a structure fast enough to send memos to laser printers which were being invented at PARC. The rest would come later: email, images, voice, music and video, all in small data sets, called packets.

Metcalfe and Boggs, students at Stanford University, worked for months to deploy this network, based on the concept of packages of ARPAnet, and the help of many researchers from PARC. In a **memo** to

his team in May 1973, Metcalfe described the architecture conceived and gave it a name: the "Ether Network", or a literal translation, the network of the ether.

The name has been accepted, the development of technology has progressed and today other researchers seeking to explore the possibility of being able to support Ethernet communication

data of a terabit per second. This Wednesday, Metcalfe and others present at the dawn of Ethernet celebrate the 40th anniversary of the grid technology, with the event Ethernet Innovation Summit at the Computer History Museum in Mountain View, California.

A breakthrough for High

Ethernet not the result of an accidental discovery. After spending nearly two years working on the Arpanet, Metcalfe was employed at PARC to develop a network capable of connecting new computers installed in the center.

A visionary institution named Alan Kay invented a system called Alto, which constituted a computer to the desktop of employees. "It created a problem that never existed before," Metcalfe said: "What to do when you have a building full of computers?"

There were already some LANs (Local Area Network) at that time, but had serious limitations, says Metcalfe. The PARC used a type called Data General MCA, used with their mini-computers Data General Nova.

Would connect only 16 systems, and had to be in the same room. The cables were 1.5 inches thick, recalls.

At their desks, Metcalfe and colleagues had ASCII text terminals. And communicate with a computer 300 bps. The speed was not enough to send files to a printer with high resolution technology, able to print one page per second.

Were to enter the digital world of the future, with the communication technology of the past.Although not everyone had agreed at PARC, Metcalfe reveals, it stressed that the networking would be critical to the new computers.

"All that power would be wasted if the machines were not connected," said Metcalfe. The system designed by Metcalfe and Boggs supplant any time of LAN.

"Our specifications passed interconnect 255 personal computers with the distance of a mile between them, with a bandwidth of hundreds of kilobits per second ... and wanted to do it using a minimal amount of cable, because the networks predecessors needed to use rooms full of cables, we called mouse nests, "says Metcalfe.

The AC Metcalfe and Boggs proposed responded well to all those requirements and provided by communication speeds of 2.94 Mbps. It would be a decent speed for a 3G mobile network today.

But Metcalfe prefers not to round the number, even today. In 1973, explains a rounding 60Kbps was, in practice, significant bandwidth itself: more than the bandwidth of the Internet connection transcontinental.

However, compared with the bonds at 300bps of those links desktops, the new network was an embarrassing wealth: it would be ten thousand times faster.

Focus on distributed computing

When designing the network, put emphasis on supporting distributed computing, a new concept at the center of all the work done at PARC at the time. Represented an important gap in relation to sharing systems that dominated the electronic computing since its inception in the 50s.

All PCs connected to the LAN shared one cable, and the algorithms that ran the network were distributed among them. On each participating computer was installed an add-on card with Ethernet microcode running on a standard processor.

"It was just a cable in the hallway and the PC linked to it at the point nearest to them was," says Metcalfe.

Metcalfe Boggs and were re operating in November of 1973.Earlier, the employees of PARC could ask for a high with or without Ethernet, but soon all depended on her, he said.

One of the reasons why this happened was the use of an application used to test each of the semiconductor memory High technology has yet to mature. The scientist at PARC, Chuck Thacker, scheduled a diagnostic routine that run in Alto, testing the system memory when the user was not using it.

After sending test results to system maintenance via Ethernet. But the main use was to send print jobs to printers and reach the Arpanet, through one of the first routers and some long-distance lines.

The evolution was gradual: laser printers appeared in 1974 and the email by 1976, says Metcalfe. Over the 70 years, the use of Ethernet has expanded, but only around the premises of Xerox and a few institutions such as Stanford and MIT, where he was doing cutting-edge computing.

The White House also received an Ethernet network, along with some Altos. For a time, Xerox was prepared to sell the Ethernet technology as a commercial product: it would call the Xerox Wire, and would be part of an office system owner.

However, in 1980, the company proposed technology to the Institute of Electrical and Electronics Engineers (IEEE), as an open standard. In parallel, other companies have developed their own schemes LAN, so there are several other approaches.

In the end, eventually designating three as IEEE standards: Ethernet, Token Ring from IBM, and a system of General Motors, called Token Bus While GM's proposal has not gone away, and the Token Ring LAN to other approaches, including ARCNET, survived.

"After we spent a few years matarmo us each other, and Ethernet ultimately prevailed," explains Metcalfe said. "But it was a long process."

In the late '80s, Ethernet had actually prevailed, according to its creator. Had supporters as companies like Intel, Digital and small business launched by the Metcalfe, market adapters and network equipment: 3Com, bought already this century by HP.

10Mbps could be too

PARC's team took the Ethernet to the level of 20 Mbps of bandwidth. However to ensure that it would work with Intel chips, reduced this capacity by half as normalized value. Still, there were certain someone would need this level of bandwidth.

"We discussed the possibility of being too 10Mbps. Then came the limit of 100Mb, gigabit, and then, later still 40Gb and 10Gb, and 100Gb and 400Gb now the level of being standardized, and there is talk of terabit, "says Metcalfe. "The big surprise is that there is an increase of the bandwidth in Ethernet, there has always been the emergence of new applications."

As with other technologies widely used, success has brought more successful. Each iteration has become cheaper as has become more ubiquitous. A key factor for the success of Ethernet was the fact that each new version is compatible with previous Metcalfe explains.

Metcalfe shares the patent with Ethernet Boggs, so with Thacker and Butler Lampson, another guru PARC. Many others at PARC helped develop software and hardware for the new network, said.Today, Metcalfe is a professor at the University of Texas at Austin and says it will develop a career as a venture capital investor at Polaris Partners. Boggs co-founded the Media LAN, a manufacturer of network adapters, purchased by SBE in 2000.
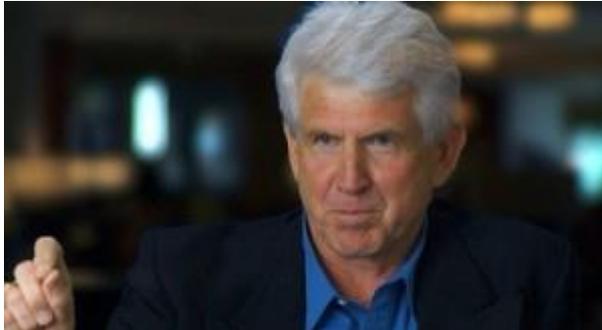
Ethernet was first supported on coaxial cable and then switched to double cable ("twisted-pair cable"), but also reached other media.Depending to whom pregunta, technology has helped to weave other technologies. If the bandwidth 1Tbps was not in the minds of the creators of technology, there were other forms of Ethernet. In the memorandum of May 22, Metcalfe predicted that Ether Network run on cable television and telephone or on radio technology, and up to the electricity grid.

Inventors misbehaving

Ethernet reached all these media by making part of the base of WiFi according to Metcalfe. But though the technology has evolved into something very different and the route had "hundreds of inventors," according to the professor. And why is that Metcalfe is eager to be at the event this Wednesday in California.

"One of the things that inventors do when they meet is to discuss about who invented what, who did it first, and who are the charlatans, and we ended up witnessing behaviours really ugly," he explains."I'm just like those people."

"I'm also old enough to realize how ugly it can be. So I prefer to leave to discuss with them and celebrate their contributions only "suggests Metcalfe. "In our conference on 22 May, I hope all the unknown heroes of the Ethernet appear and tell your side of the story."

(Stephen Lawson / IDG News Service)