



## Laudatio

*Por el catedrático Juan Quemada*

I have the honor to present the Laudatio for the investment as Doctor “Honoris Causa” of two exceptional personalities who have played a key role in the creation of two fundamental pillars of today’s Information Society, namely “Dr. Vinton G. Cerf, Father of the Internet” and “Prof. Tim Berners-Lee, Inventor of the World Wide Web”.

The Internet and the Web complement each other and both together constitute the most powerful global information system ever created by mankind to support communication, knowledge creation, collaboration or social interaction.

During the last decades our society and our economy has seen a huge change, which has been caused by the, so called, “Information and Communication Technologies Revolution”, and this revolution would have never happened without the Internet and the Web.

Both, Vinton Cerf and Tim Berners-Lee, have made contributions to advance the state of the art in many different aspects and from many different positions during his professional carrier. They include, technical and architectural designs and proposals, definition of policies and strategies, or leading teams, committees and organizations. And very especially they have provided leadership and inspiration to the many people participating in the creation of the Internet and the Web.

As a technical person I must say that I am most impressed by the soundness and scalability of the architectures they both defined, namely TCP/IP and the Web architecture, which have permitted the huge growth and impact the network has had.

I will present first the more detailed view of the achievements and merits of Dr. Vinton G. Cerf only because I’m following a chronological order of occurrence.

Dr. Vinton G. Cerf was born in Connecticut in 1943. He graduated in Mathematics from Stanford University in 1965. After working for a short period at IBM he enrolled at UCLA’s computer science department to start working for an MSc and his PhD. He worked first in the Snuper computer. He started to work in 1968 in the ARPA Network Measurement Center in the group of Leonard Kleinrock and started participation in the Network Working Group (NWG) where many working procedures of the future Internet were started. He worked in the development and deployment of the ARPA Network Control Protocol (NCP) and

of the first ARPANET node at UCLA. ARPANET was the first operational packet switching network and the first step enabling the development of the Internet and the World Wide Web.

In 1974 he proposed together with Robert Kahn in his paper entitled “A Protocol for Packet Network Interconnection”, a protocol named “Transmission Control Protocol” or shortly TCP. TCP created an end-to-end virtual circuit service over a connectionless datagram service, which made the use of packet switched networks efficient, while facilitating the programming of applications, which were based on an end-to-end virtual circuit paradigm.

From 1976 to 1982 he was program manager of the “ARPA Internet” program and a principle scientist at ARPA. He continued work with Robert Kahn to invent the TCP/IP architecture, which separated routing and information transmission control into two separate layers and which became standard for Internet communications in the early eighties.

The Internet flooded into the academic and research institutions after TCP/IP was standardized as the core protocol of the Internet, enabling the development of applications over TCP/UDP and also of networking technologies, which could be easily integrated into the Internet from then on.

TCP/IP was the architectural element, which enabled decoupling the functions of the network into separate layers enabling the independent evolution of each of them: networking technologies, switching technologies, information transport and application development. From then on applications could transport information independently of the switching or communication technologies used. This separation of concerns enabled the explosion of new applications and networking technologies, which we have seen on the Internet.

Since 1982 Vinton Cerf has hold many outstanding positions in companies or organizations like Vice-president of MCI, Vice-president for Technology and Senior Evangelist of CNRI, Chairman of the ICANN Board, Founding President of the Internet Society, Honorary Chairman of the IPv6 Forum or Vice-president for Technology and Senior Evangelist of Google where he is now. During this period he has continued his engagement in the development and tuning of the Internet, including the transition to IPv6, the successor of the actual Internet Protocol (IPv4).

Vinton Cerf is a recipient of numerous very prestigious awards and commendations in connection with his work on the Internet, including the Turing Award, National Medal of Technology, Presidential Medal of Freedom, Japan Prize, the Principe the Asturias Award for Science and Technology and many others. He has been also invested Doctor “Honoris Causa” also by numerous Universities.

During all those years he has been and still remains a key player in the evolution of the Internet.

Prof. Tim Berners-Lee was born in London in 1955. He graduated in Physics from Queen's College at Oxford University in 1976. After graduating he worked at Plessey Telecommunications Ltd first and at D.G. Nash after. In 1980 he made a six-month stay at CERN, the European Particle Physics Laboratory in Geneva, where he developed the Enquire information storage program, which was never published, but which formed the conceptual basis of the future World Wide Web.

Back to England he worked at John Poole's Image computer System Ltd until 1984 where he took a fellowship at CERN again and started working in variety of developments until 1989 where he further developed the idea of extending hypertext to a network context and presented in March a proposal to his boss Mike Sendall, entitled "Information Management Proposal", which he considered "vague, but exciting".

He continued the exploration of the idea, but he didn't start development until he convinced his boss in 1990 to buy him a NeXT machine. He had developed by Christmas 1990 the first Web browser and wysiwyg editor, called "WorldWideWeb", and the first server, called "httpd", which did serve HTML content as well as FTP content at <http://info.cern.ch>. In 1990 Tim Berners-Lee started to collaborate with Robert Cailliau who got enthusiastically convinced about the potential of the World Wide Web.

The World Wide Web was the user-friendly collaborative information container needed by the Internet to allow widespread use and after some consolidation years, adoption boomed and the Web was the driver for the adoption of the Internet by companies and society in general.

The architecture of the World Wide Web, based on URLs, HTTP and HTML did revolutionize the development of applications. The Universal Resource Locator (URL) created a universal addressing space for any resource on the Internet, which could now be retrieved with HTTP. And HTML enabled an easy creation of digital hypertext documents, which could now be published and linked together over the Internet. But this was only the starting point, because innovative applications started to boom on the Web.

The use of hyperlinks over the network enables new ways of sharing knowledge and information, collaborate at a global scale, manage social relations or access remote services, and has produced a radical change in corporate organization, as well as in personal, private or public relations.

During his 20 years of existence the Web has created the pillar over which a new dimension of human society has started to grow: the network-society.

This process was coordinated by the World Wide Web Consortium (W3C), which Tim Berners-Lee created in 1994 at MIT with the following mission:

"To lead the World Wide Web to its full potential by developing protocols and guidelines that ensure long-term growth for the Web".

Tim Berners-Lee has continued his engagement in the development and tuning of the Web, not only as Director of the World Wide Web Consortium, but actively

participating in the technical developments, for example in the Semantic Web or in the Linked Data Movement, which is the next big challenge to be incorporated to the Web.

In 1999, he became the first holder of the 3Com Founders chair at CSAIL of MIT. He is the 3COM Founders Professor of Engineering in the School of Engineering of MIT. In December 2004 he was named Professor in the Computer Science Department at the University of Southampton, UK, at which he holds a chair. He is co-Director of the Web Science Research Initiative (WSRI) launched in 2006, which aims at achieving a better understanding of what the Web is, engineer its future and ensure it's social benefit.

Tim Berner-Lee is a recipient of numerous very prestigious awards and commendations in connection with his work on the Web, including the ACM Software Systems Award, IEEE Koji Kobayashi Computers and Communications Award, Knight of the British Empire, Die Quadriga Award, Japan Prize, the Principe the Asturias Award for Science and Technology and many others. He has been also invested Doctor "Honoris Causa" also by numerous Universities.

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I would like to conclude by saying that we have only to look around us to see the huge impact of the contributions made by both Vinton Cerf and Tim Berners-Lee, who are two men of great vision, as well as outstanding researchers and engineers, with enormous capabilities for technical innovation and management, who have also a deep understanding of the social and economical implications of technology deployment.