In Conversation with

Vint Cerf

9 March 2020

Bristows

World renowned computer scientist, Vint Cerf, is one of the founding fathers of the internet. On Monday 9 March 2020 he joined Bristows' Robert Bond on stage for a fireside chat.

Robert Bond introduced Vint Cerf as one of the cocreators of the TCP/IP Protocols, thus commonly referred to as a "father of the Internet", President of the Internet Society and Chief Internet Evangelist at Google. He is also recipient of the Medal of Technology, the Alan Turing Award and the Presidential Medal of Freedom.

Has being a "Father of the Internet" lived up to your expectations?

Mr Cerf wanted to first highlight the role the UK has had in the creation of the Internet through the involvement of numerous University of London academics to which we owe various breakthroughs, including coining the term "packet", commonly used to refer to data units being transferred through any network.

He expressed his fascination at the wild success of the Internet, noting the importance of the development of the smartphone in consolidating that success. It has also brought about negative aspects, such as some of the uses being made of social media nowadays, and the challenges of misinformation. The Internet has therefore proven to be a mixed bag, with some amazing applications and some concerning consequences. The incidence of cyberwarfare is particularly concerning for Mr Cerf, who advocates for the development of international agreement setting boundaries to some of those uses, such as the prohibition of DDoS attacks.

Were privacy or ethics areas of concern at the time the Internet was created?

The Internet was initially an entirely private and mostly academic initiative, and it originally did not have any application that would expose personal data to malicious uses. Those were therefore not topics that anyone had in mind originally. Ethics is however now a major concern, particularly in the age of the Internet of Things, which exposes us to all sorts of abuses, e.g. in connection with malicious use of webcams or self-driving cars.

Mr Cerf highlighted how important it is that service providers continue to be able to guarantee that any issue with their devices or software is timely fixed, and noted additional challenges regarding the source of some of those, including the proliferation of fake software and all sorts of malware. He gave the example of a recent attack on a domain resolution provider by hackers having taken control over 500,000 webcams with low security settings, which managed to knock down the websites of several important companies.



Vint Cerf

Hopefully, cryptography may bring solutions to some of those challenges, e.g. via chipsets with inaccessible crypto keys. Source code for devices and their software which are falling out of support should also be made available to third parties to ensure that support continues to be provided until the end of the expected lifetime for that device.

Mr Cerf pointed out that that the legislative framework will need to catch up with technology faster than it currently does, for example in relation to self-driving cars. If there is regulation concerning whether you need to wear a seat belt, there should be regulation addressing the requirements for that software.

What are the prospects for the long-term preservation of digital information?

We have kept some ancient information, such as Mesopotamian warehouse records, that were not supposed to survive that long, and we must make an effort to keep information from our own time, bearing in mind that digital media are worse than the materials used to record information in ancient times. Most CDs and floppy disks are slowly degrading and becoming unreadable, not to mention older formats such as tape. Backward compatibility is also a challenge. We need to think of ways of preserving these media for hundreds of years, which is a much longer period than the lifetime of any one company. Archival entities are facing legal challenges with rights attached to the content they are trying to preserve. The National Archives, the Bodleian Library, and the British Library are all interested in this issue of digital preservation.

Answering a question from the public, Mr Cerf mentioned that the focus should not so much be on maintaining old software in support, as development and innovation are unstoppable and it is inevitable for support to be dropped at some point, but he would like to see the source code of that software being made available for historical value.



Robert Bond

What is the "Interplanetary Internet"?

In answer to this question, Mr Cerf told the story of the evolution of communications supporting space exploration. In 1987, when the Pathfinder probe landed in Mars, point-to-point radio waves were the only method of communication between the two planets, very outdated already for that time. He wanted to build an interplanetary network to support space exploration, based on the TCP/ IP Protocol, but the math did not add up: It took three and a half minutes for a signal to propagate, then 20 minutes one way, 40 minutes both ways. Planet rotation was an additional problem interfering with communications. Finally, experimental interplanetary protocols using X band radio at 28kbit/s were developed relying on the equipment pre-installed on the Mars Rover and the Orbiter. These protocols have been running since 2004 and have been approved as standard for interplanetary communications, will support the next Moon landing and are regularly used to communicate with the International Space Station. Mr Cerf remembered this as one of the most exciting times in his career.

Can you tell us your concerns about accessibility in the development of software and devices?

Mr Cerf is a strong advocate for accessibility measures being applied in the development of software and devices. He presses at Google for implementation of accessibility everywhere. Mr Cerf is hard of hearing himself, and shared with us some stories about his wife, who was deaf and received a cochlear implant as an adult. Before the implant, she was an excellent lip reader, so much so that she worked for the CIA in that capacity (not being able to share that with him until much later). 20 minutes after she got the implant, she received her first phone call, and she has never stopped using it since. There has been great developments and innovation in his field, and Mr Cerf would love to see that same spirit applied to innovation in the field of accessibility in software development.

Tell us about your sartorial approach to dressing, famous in the industry.

Mr Cerf used to dress in casual sports attire like everyone else, but when he moved to Washington DC his wife forced him to dress up in a three-piece suit to fit in. He recalls everyone thinking he was the best dressed person in town, and therefore he has not changed his approach since. Nowadays he is obviously the only person at Google who dresses like that, and on several occasions he has even tried to turn it up a notch by dressing in academic regalia obtained from various academic circles.



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