

## **Welcome Message**

**For the Opening of the Technology Trends Conference**

**3 April 2018, 9:30**

**Room XXV, Palais des Nations,**

**Geneva**

Dear Guests,

I am very grateful for an opportunity to offer brief observations about the topics of your very timely conference. We have come a long way on the path to autonomous software. This is not so much about artificial intelligence or machine learning, but more generally about software in devices at the edge of the Net we refer to as the Internet of Things. These devices are programmable and have Internet communication capacity. They are typically given substantial decision making responsibility although it may be over a fairly narrow domain. For example managing heating, ventilation and air conditioning, home or industry security systems, numerical controlled milling machines, intra-warehouse delivery services and so on. Even when there is no machine learning involved, we allow these devices to rely mostly on their autonomous software to carry out their assigned tasks.

We should be concerned about the possibility of mistakes in the software, and be assured that replacement software can be downloaded from the Internet or other source. We should also be assured that the updating software comes from the right

source and has not suffered any modification between its generation and its absorption by the receiving device. Strong authentication is our friend here.

We are already seeing the need for powerful processing at the edge of the Internet in addition to its core where we typically find the data centers and cloud services. We need this capacity at the edge in case the Internet access fails. One does not want one's house or manufacturing plant to fail just because access to the Internet is temporarily unavailable.

We are seeing the emergence of new classes of computation, notably quantum computing and machine learning that have delivered spectacular results but also demonstrate significant brittleness in the face of unexpected inputs.

On the communication side, 5G looms (whatever it may end up being) and is drawing on higher and higher frequencies and offering the potential for multi-gigabit communication. We are also seeing new opportunities for sharing and shared access to spectrum, making our use more efficient and flexible.

The topics under discussion in the conference will be core parts of the next ten years of telecom and computing evolution. Many questions remain and many opportunities await leadership. There is no time like to present to engage in fruitful dialog and to set a course for vigorous and ethical development.

Vint Cerf  
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