

WIRELESS BROADBAND

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A data tsunami is currently straining broadband wireless networks around the globe. This exponential growth in traffic demand is fueled by several trends, including (i) the proliferation of smartphones, tablets and portable computers loaded with multimedia applications, (ii) the emergence of “the cloud” as a central data repository that must be constantly accessed, and (iii) the connectivity of a new class of users of which there is an almost infinite supply: machines.

Altogether, the tsunami brought about by the confluence of smartphones, cloud computing, and machine-to-machine communication, is poised to increase the volume of wireless traffic to staggering levels. Over the next decade, the volume of wireless traffic could increase by 3 orders of magnitude.

At the same time, there is a growing perception that physical-layer wireless research, long the driving force of advances in wireless communications, has become a mature discipline whose gains have mostly been exhausted already and will only be incremental henceforth. This rules out substantial further improvements from signal processing, waveform design, coding, interference management and cancellation, multiple access, or power control. Without new leaps at the physical layer, it is unclear whether, and how, the multiple-order-of-magnitude increases in capacity that will be necessary to satisfy this demand could be attained. If they cannot be attained purely through physical layer advances, then how? Will they require a wholesale re-design of network architectures? Drastic changes in spectrum regulation regimes?

Debating this issue and its many ramifications is the theme of this session, with speakers with broad backgrounds in physical layer communication, network architectures and spectrum regulation from both academia and industry.