

## Abstract:

The availability to connect to the internet is having a profound impact on people, business and society. Today, the mobile networks have outpaced the fixed access and become the most used technology through which people get their internet access. With this comes growing expectations on mobile network quality. These expectations are further fueled by smart mobile devices that have enabled new user behavior. Providing ubiquitous coverage is an important factor in achieving positive user experience for both casual and frequent users. Together, coverage and speed form the most important network quality satisfaction determinants for users. The median global downlink speed for smartphones from the first half of 2010 until the first half of 2012 has increased with approximately 70 percent. And we expect this increase in the data rates to continue in the years to come.

To meet the end-user expectations the industry has had the foresight to ensure that the IMT technologies have been evolving over time to meet the increased demand, not only for higher data rates but also for coverage and capacity. New deployment techniques such as Heterogeneous Networks have been added to the toolbox. And the challenge of deploying cost effective wide area coverage has been addressed e.g. by smart antenna solutions as well as through the addition of new frequency band in the sub 1 GHz part of the spectrum. New technologies to lower the energy consumption has been added which will enable deployment of mobile sites where access to the energy grid is not possible, using instead other means of powering e.g. solar power.

But the exciting developments are not limited to the radio interface alone. To support the rollout of the new sites and new radio technologies there has been a large focus on providing solutions for the networks to be self-organizing in the initial deployments, and also to have self-optimizing functionality as well as self-healing capabilities. This will help the operators to significantly reduce the time and cost it will take to deploy and manage these networks. Also in the area of backhaul there has been large technological advancements both in terms of providing higher data rates on existing technologies, e.g. through improvements of micro-wave technologies, as well as in developing new solutions such as new innovative Non Line of Sight (NLOS) technologies, self-backhauling and meshed backhaul technologies.

Finally, in an environment where we see cloud technologies being increasingly used as a mean to deliver new innovative applications, we are also seeing very exciting trends where the network is combining software defined network (SDN) technologies and virtualization technologies to offer the network as a platform for new innovation by building a Service Provider SDN, opening up functionality in the network to the world of application developers.