METIS 5G Vision

Views on Beyond-4G/5G panel
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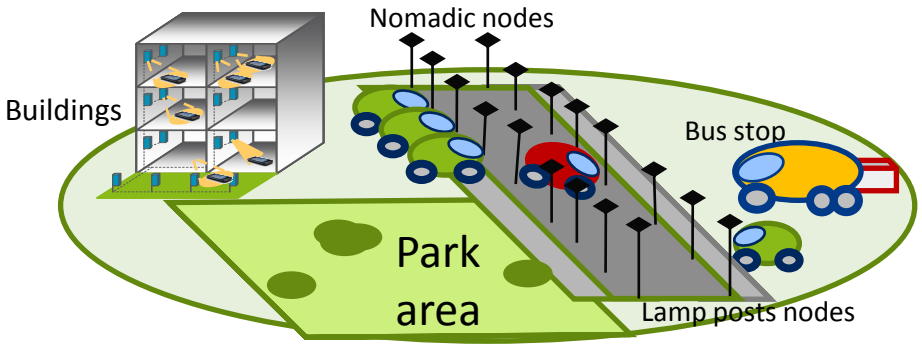
www.metis2020.com

5G Challenges

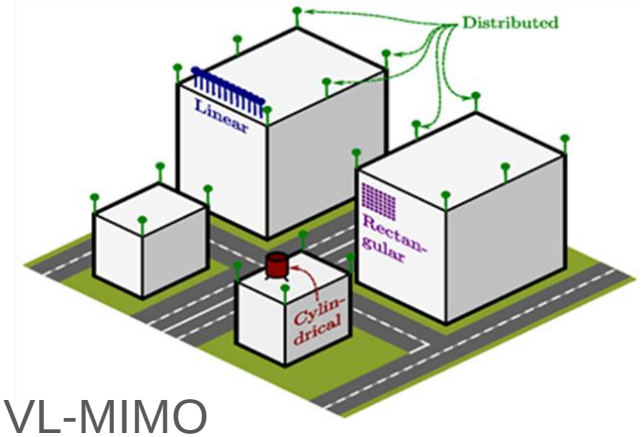
Data rates	Multiple Gbps / 100s of Mbps	5G MBB, UDN
Capacity	36TB / 500 GB /month/user	
Spectrum	Higher frequencies & flexibility	
Energy	~10% of today's consumption	
Latency reduction	~ms	URC, MN
D2D capabilities	NSPS, ITS, resilience, …	
Reliability	99.999% within time budget	
Coverage	>20 dB of LTE	
#years on battery	~10 years	MMC
#devices per area	300.000 per access node	
Modem cost	~$1 modem cost	

Some 5G Technology Components

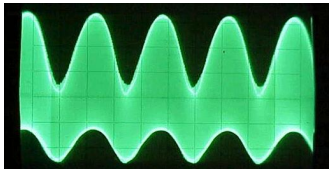
New spectrum bands and access methods



Dense and dynamic networks
Multi-hop wireless backhaul



VL-MIMO
Massive multi-antenna systems

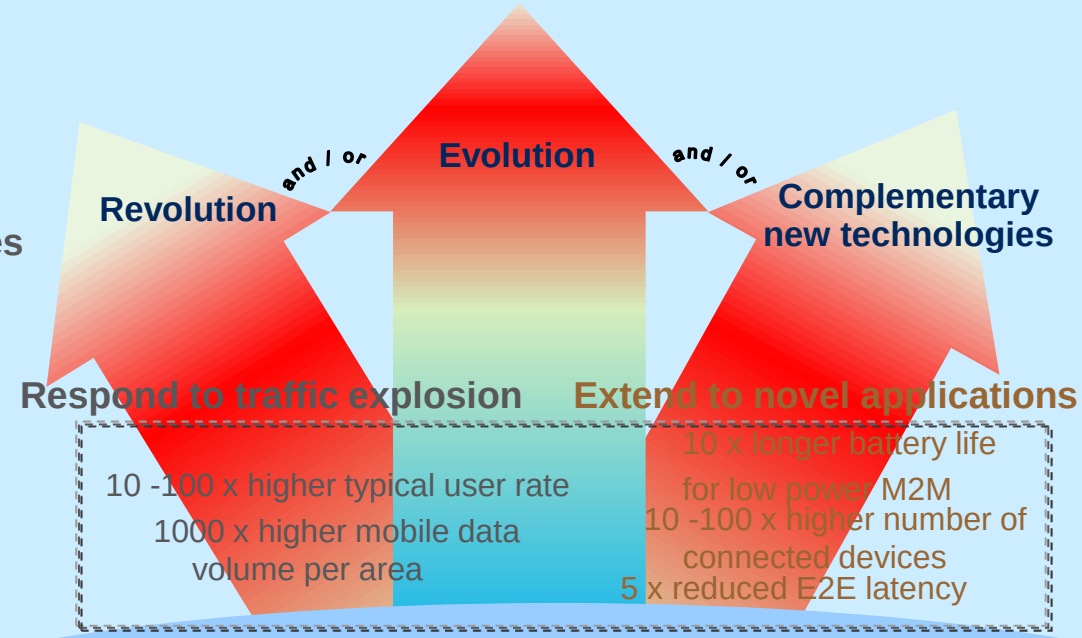


Air interfaces for new applications
and reduced signaling

5G Vision

Integration of access technologies
into one seamless experience *anywhere*
and *anytime* to *anyone* and *anything*

- **Higher frequencies & new spectrum access**
- **Ultra-Dense Networks**
- **Moving Networks**
- **Massive MIMO**



- **Mobile, Reliable D2D Communication**
- **Ultra-Reliable Communications**
- **Massive Machine Communications**

Main technologies in 2012

3G | 4G | Wifi