

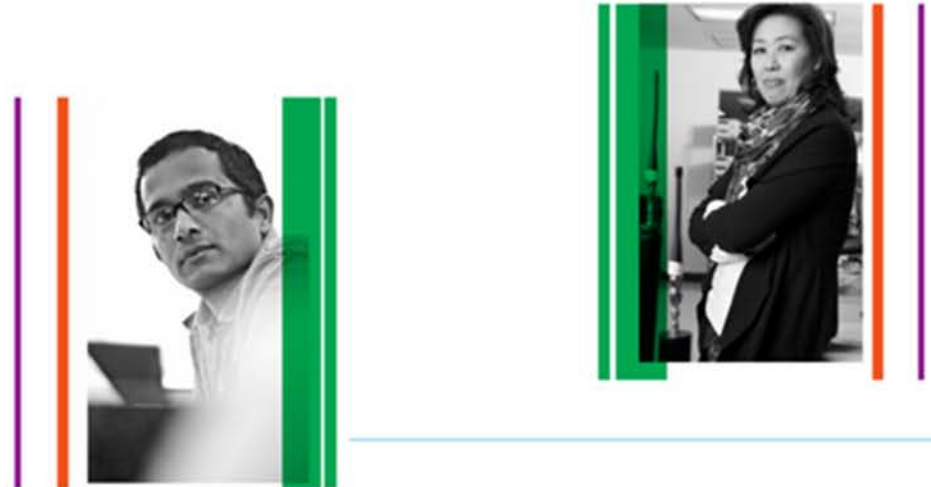
## Towards 5G *The Living Network*

Alain Mourad

[alain.mourad@interdigital.com](mailto:alain.mourad@interdigital.com)

Issy-Les-Moulineaux (FR)

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invention | collaboration | contribution

# Evolution of Wireless – *Towards 5G (The Living Network)*



## (1) Spectrum Sharing & Full Duplex

In the spectrum opportunities game, it is lot easier to find one band than two

## (2) Millimeter-Wave & Edge Caching

In the latency game, this marriage may be the union that delivers on 1 ms

## (3) D2D/M2M & Info Centric Networks

D2D/M2M has long road to play in the virtual resource fabric

## (4) New requirements New Waveforms

Ultra BB, Asynchronous, Sharing, Energy, Latency  
→ "OFDM"?

## (5) Front Haul & Backhaul in the cloud

New service paradigms that deliver flexibility and new revenues



# InterDigital Enabling Technologies

Context-Aware and  
Intelligent Radio

Mm-Wave Bands,  
Massive MIMO, and  
Full Duplex Radio

**Ultra-  
Efficient**

**Ultra  
Faster**

**Very Agile**

**Massively  
connected**

New spectrally agile  
waveforms for  
asynchronous MTC

**Smarter**

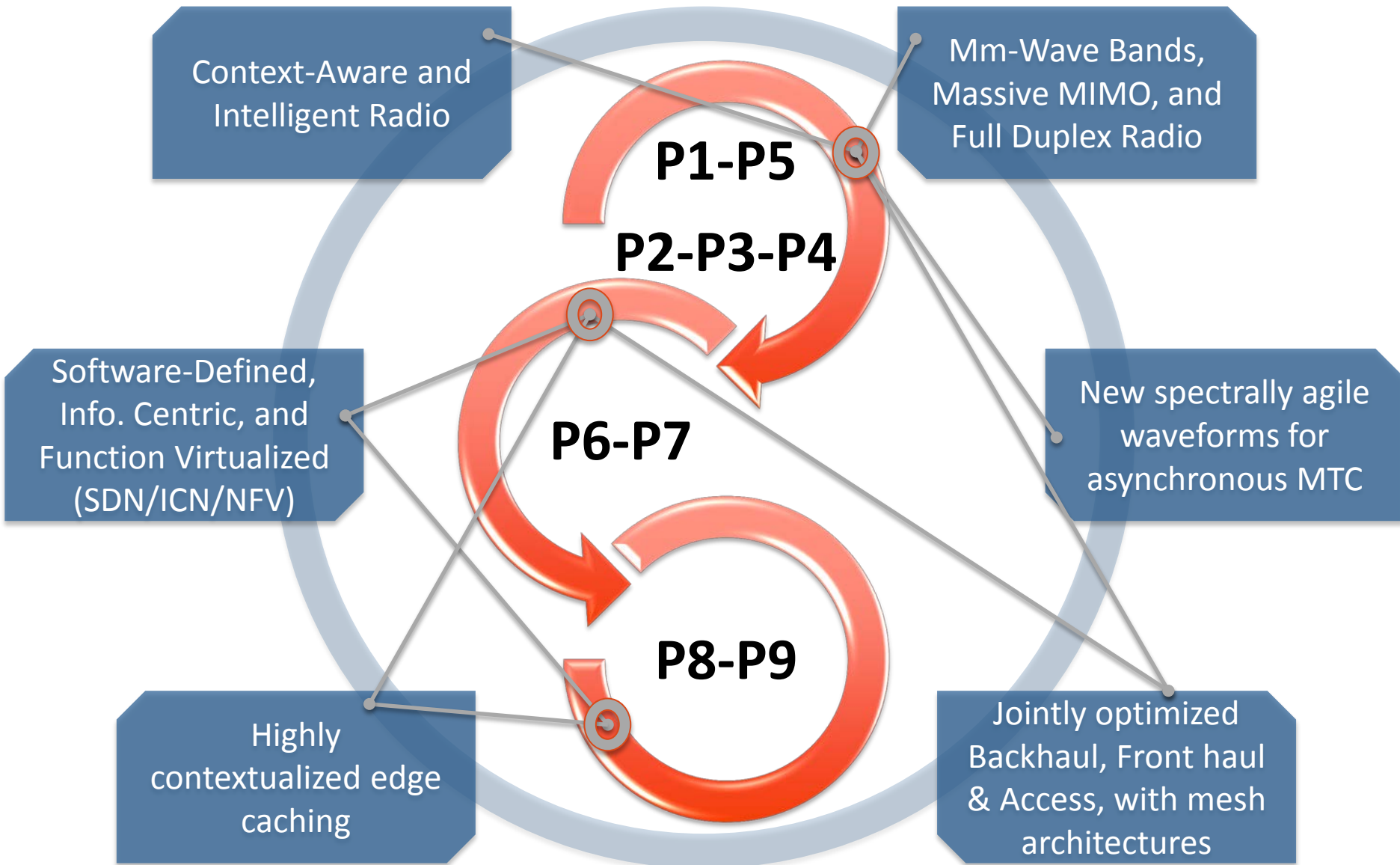
**Ultra  
Dense**

Software-Defined,  
Info. Centric, and  
Function Virtualized  
(SDN/ICN/NFV)

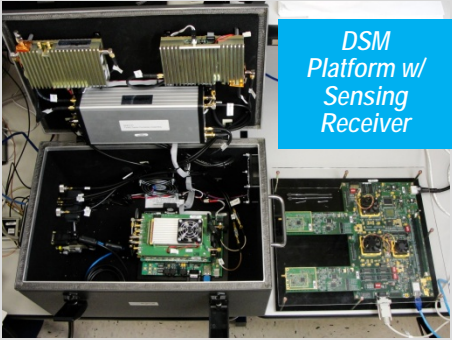
Highly  
contextualized edge  
caching

Jointly optimized  
Backhaul, Front haul  
& Access, with mesh  
architectures

# Mapping our Technology onto the 5GPPP Model



# Annex – Advanced Technology Implemented in Reference Designs, Test Platforms, Apps, and Simulations....

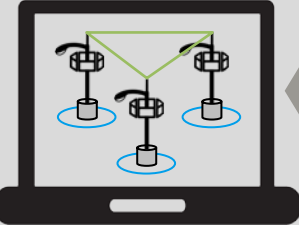



**DSM Platform w/ Sensing Receiver**

**Integrated Platforms for Testing & Validation**

**FPGA / ASIC Design**

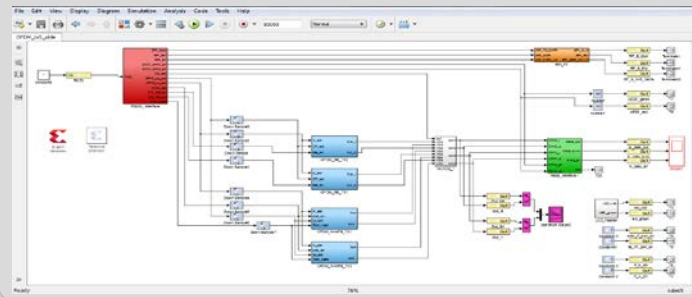
- Xilinx
- Altera
- Mentor
- Synopsis





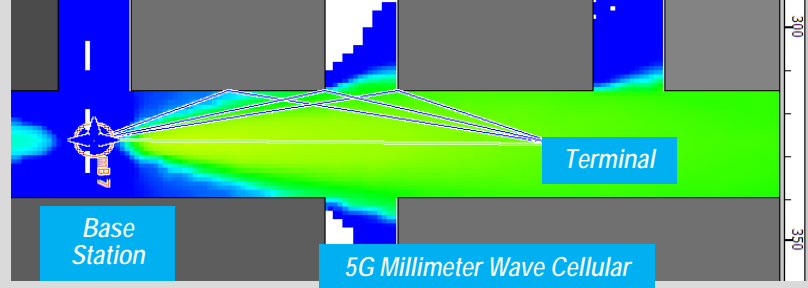
**mmW Small Cell Mesh Backhaul Development Platform**

**MATLAB, Simulink, LabView, SPW, C/++, Java ...**



**New Waveforms Platform**

**Propagation Modeling (WinProp/AWE & Rune)**



**Base Station**      **Terminal**

**5G Millimeter Wave Cellular**

**Advanced Connectivity Products (IC & Apps)**




**SlimChip IC 6071**

A-GPS
Power Management
Stacked Memory
USB Connector



**Smart Access Manager**

**Network Simulations: Opnet & NS3**



**Multi-RAT Aggregation**