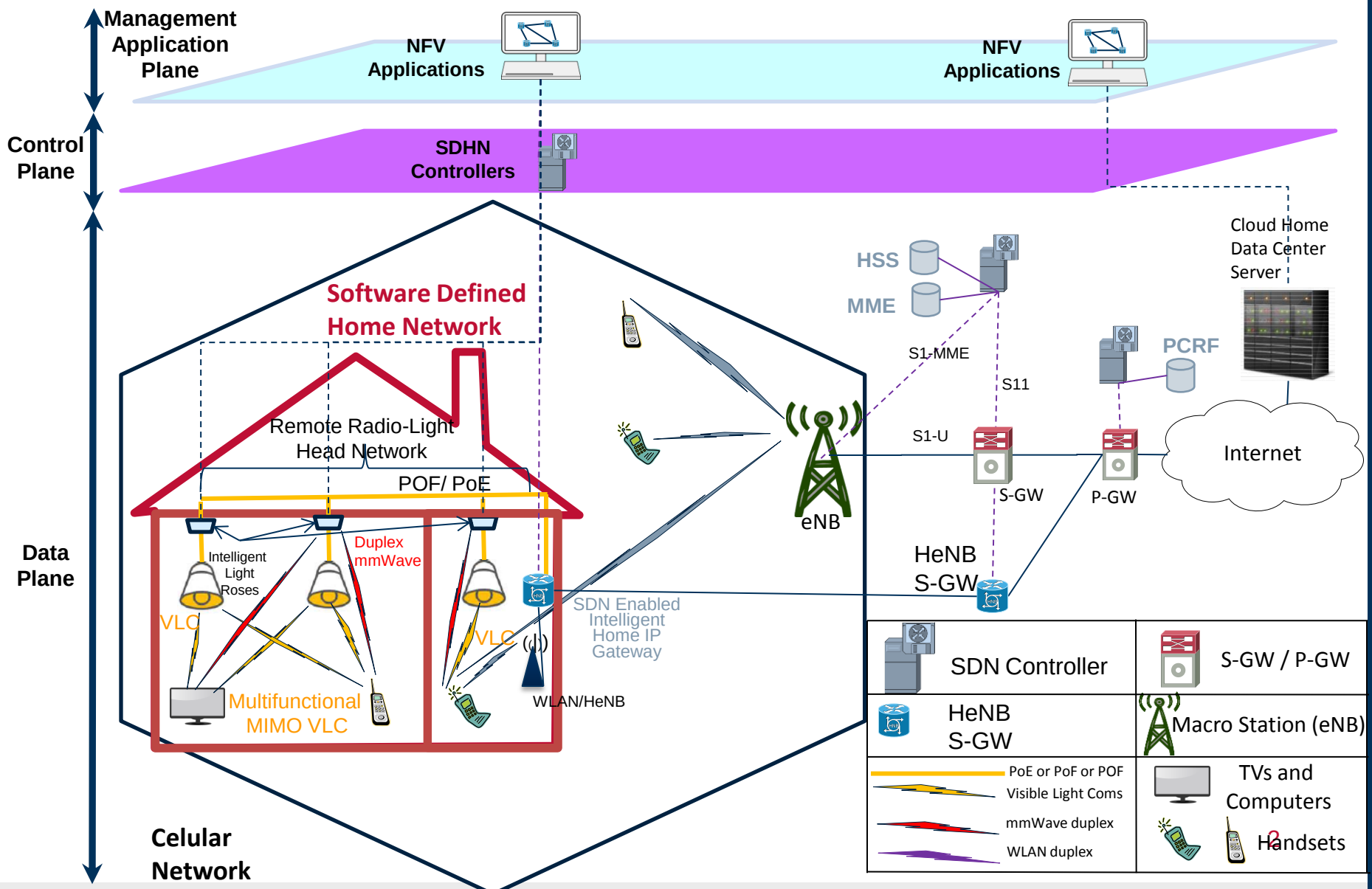
Brunel University London

Internet of Radio-Light in Buildings – 5GPPP

by Professor John Cosmas

Software Defined Home Network Architecture

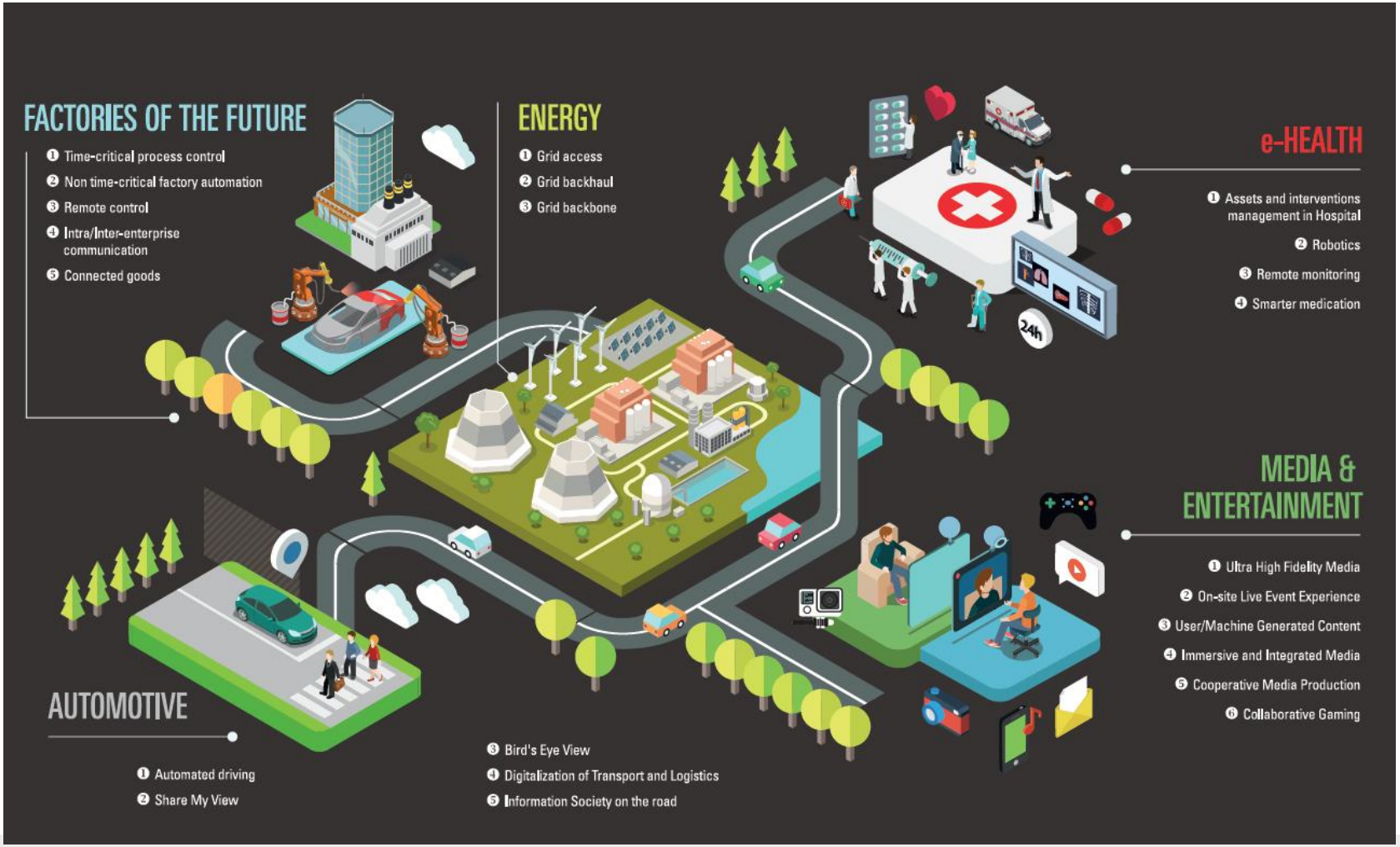


IoRL contribution to successfully address the 5G challanges

- Challange: 10 times less energy, 90% energy savings and 10x increase in battery lifetime
  - ubiquitously located RRLH access points in light roses -> considerable reduction of radiation levels and savings of UE energy consumption leading to increased battery lifetime.
- Challange: Latency to within 1ms
  - Reduced distances -> reduced propagation / transmission delays
  - Reduced signal processing buffering delay for channel estimation purposes.
- Challange: 1000x capacity increase
  - Capacity increase from 100 Mb/s to 10 Gbit/s / room
  - 10 times to 100 times higher typical user data rates in buildings obtained by
    - Multi-function MIMO applied to mmWave and VLC transmissions
    - Frequency reuse between rooms in buildings
    - 200 MHz channel bandwidth per mmWave component carrier and carrier aggregation that can combine multiple 200 MHz inter-band, contiguous and non-contiguous component carriers,

Impact on Societal Challenges in Various Potential “Vertical" Sectors

Vertical Sectors are indoors and exposed to pervasive lighting system (media & entertainment, e-health, Factories of the Future, Energy) or have lighting systems enclosing their area of operations (Automotive, Energy).



WG Contributions

WG Title	IoRL Contribution
Pre-Standardization WG	We report to the WG what pre-standards compliant architectures we propose for our home and public buildings (museums, shopping malls and metro stations) use case
Spectrum WG	We report to the WG what spectra we propose to use in the project
5G Architecture WG	We report to the WG what standards compliant architectures we propose for our home and public buildings (museums, shopping malls and metro stations) use case
SDN / NDF WG	We report to the WG on the details of the NFV/SDN API that is being developed for buildings
NetMgmt & QoS WG	We report to the WG of the subset of NFV/SDN API that is being developed for network management and QoS in buildings
Vision and Societal Challenges WG	We report to the WG on the elaboration of our techno-economic analysis of the impact our IoRL technology on society
Security WG	We report to the WG of the subset of NFV/SDN API that is being developed for network and home security in buildings
SME WG	We report to the WG on the exploitation plans of our SMEs
Trials WG	We report to the WG on the description of scenarios, testbeds and results and analysis of our building trials

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