Ranplan introduction and competences

Ranplan

- Produces the world leading indoor and indoor-outdoor radio access network (RAN) planning and optimisation tool – *iBuildNet*® suite.
- Named as one of the top 10 B2B Movers and Shakers at Mobile World Congress 2016
- Headquartered in Cambridge, UK;
  - Employs some 30 people in Cambridge
- Other offices in China, US, Middle East, Germany, etc

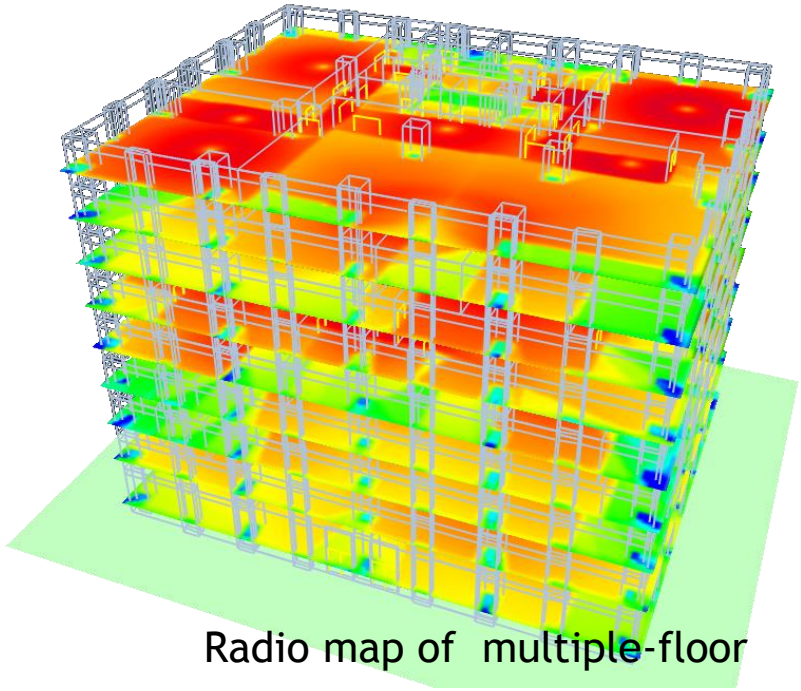
- Main product: iBuildNet
  - Used by **Ericsson, Huawei, Cisco**, **ZTE, China Mobile, Telenor, Ooredoo** etc for in-building DAS（Distributed Antenna System), indoor, indoor-outdoor small cell/HetNet planning and optimisation (P&O)
  - Partnership with Ascom (TEMS) to form **E2E RAN P&O tool suite** for worldwide adoption

- Missions:
  - Make ***iBuildNet*** the tool of choice for RAN planning/optimization in the HetNet and IoE era.
  - By 2025, over 50% of wireless users will have used the networks planned and optimized by ***iBuildNet*** tool suite.

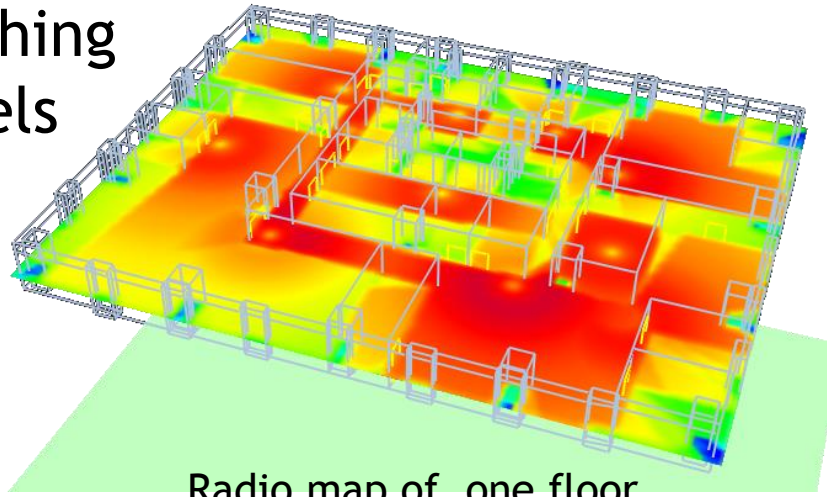

Ranplan iBuildNet® screenshots
Seamless integration of GIS, building and
Ray-based radio propagation/channel models
e.g., for small cell/HetNet deployment …
Step: -60
Step: -70
Step: -80
Step: -90
Step: -100
Step: -110

Integration of 3D building models with Ray-based radio propagation models to study 5G communications in the built environments

- **Building model:** Match all structural materials for frequencies up to millimeter waves +
- **Propagation model:** Leading ray-launching based radio propagation/channel models



Radio map of multiple-floor



Radio map of one floor

Ranplan's RAN planning & optimisation engines

- **Radio propagation engine:**
  - Ray-based
  - Works in **indoor**, **outdoor**, **indoor to outdoor** and **outdoor to indoor** scenarios
  - Works from typical cellular to **mmWave** bands
  - Supports all **multi-path** parameters specified in 3GPP TR25.996 for **MIMO** simulations

- **Network system simulator**: LTE/LTE-A, WiFi, etc

- **Data analytics engine:**
  - Data driven RAN planning and optimisation, e.g., traffic hotspot identification for small cell deployment and operation
  - Proactive network optimisation
  - Big data analysis for 5G RAN

Ranplan's interests in 5GPPP Phase 2

- **Novel air interface technologies**
  - Heterogeneous multi-layer deployments, assuring uniform performance coverage, capacity, e.g. through advanced Multi Antenna Transceiver Techniques, including 3D and massive MIMO beam-forming;
  - Enabling usage of frequency bands above 6GHz, for ultra-high speed access, backhaul and fronthaul, based on fully characterised channel models.

- Coordination and optimization of user access to heterogeneous radio accesses including ultra-dense networks, supported by intelligent radio resource management framework.

- The joint management of the resources in the wireless access and the backhaul/fronthaul

- Big data analysis for 5G RAN, including hot spot identification, caching, mobile edge computing, …

Thank you for your attention!

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