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Centro de Referência em Radiocomunicações

# Brazilian needs and perspectives for 5G Networks


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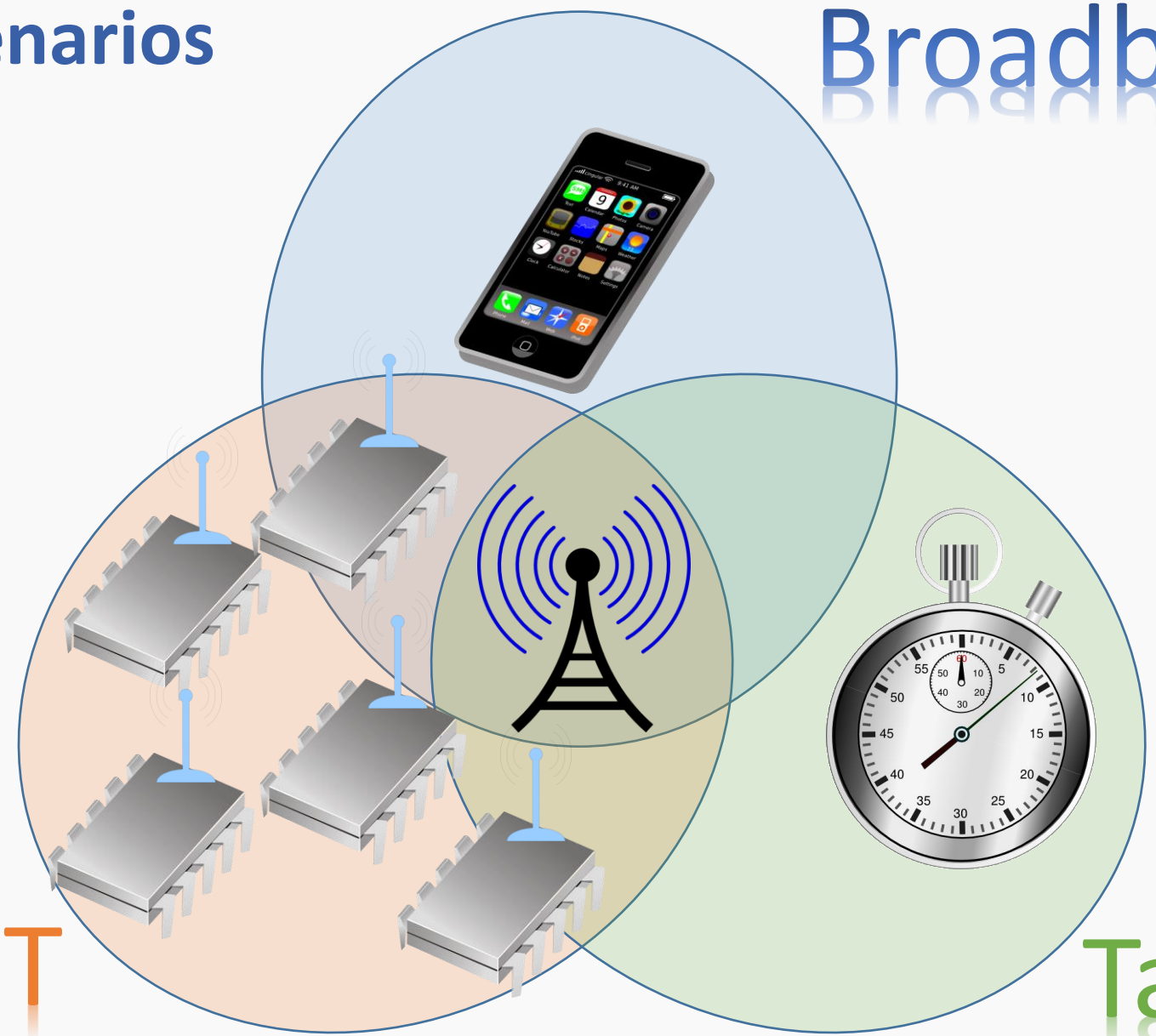
# Current 5G Scenarios



# What is missing in 5G?

- Last frontier for Internet access
  5G for Remote Areas.

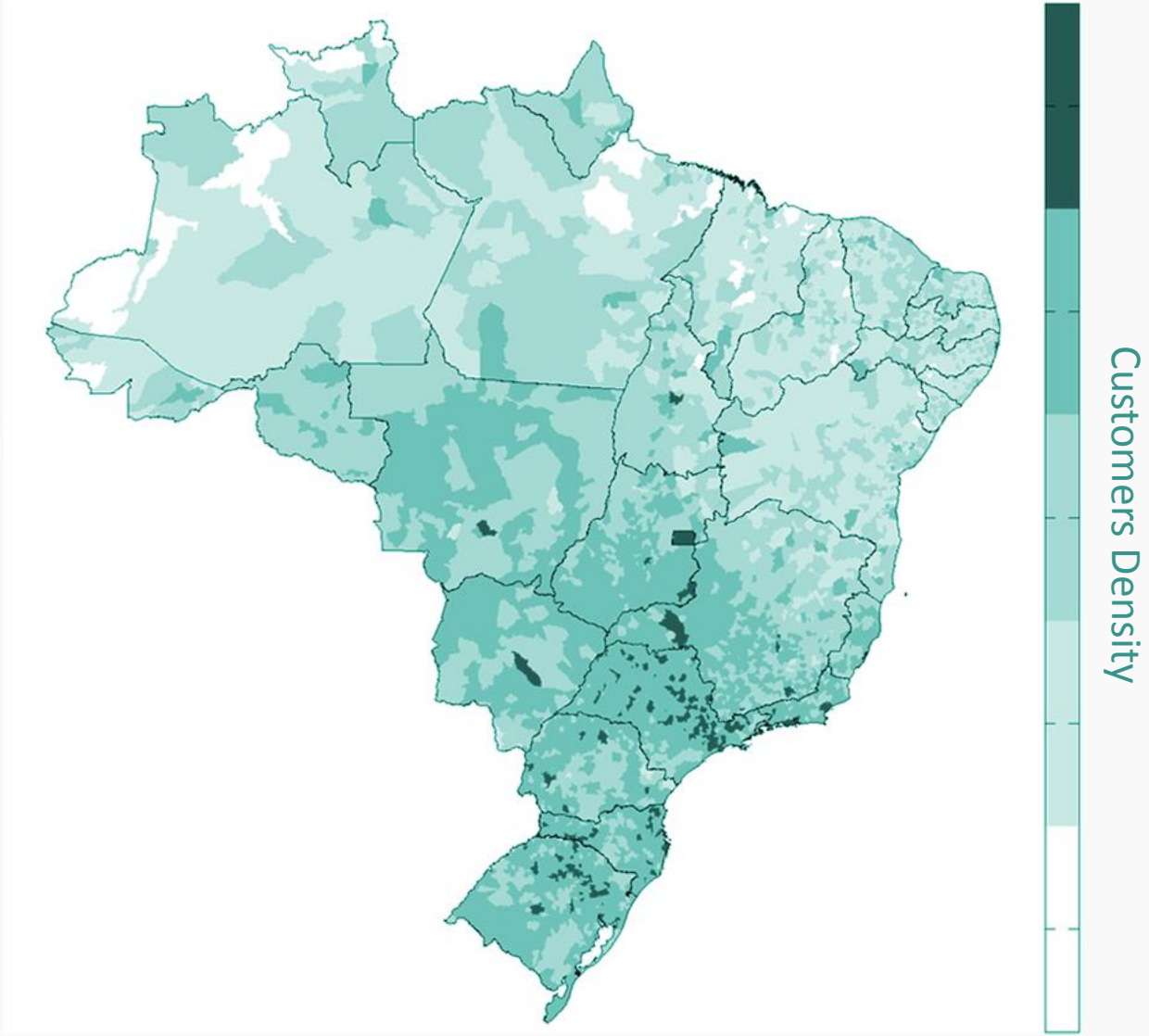
# Applications

## 5G for Remote Areas

# 5G for Remote Areas Feasibility

- Large number of new costumers spread in a large areas.

- Large coverage for 5G:
  .Licensed and unlicensed frequencies;
  .DTV dividend as secondary users;
  .Cognitive radio technology;
  .Worldwide standardization.

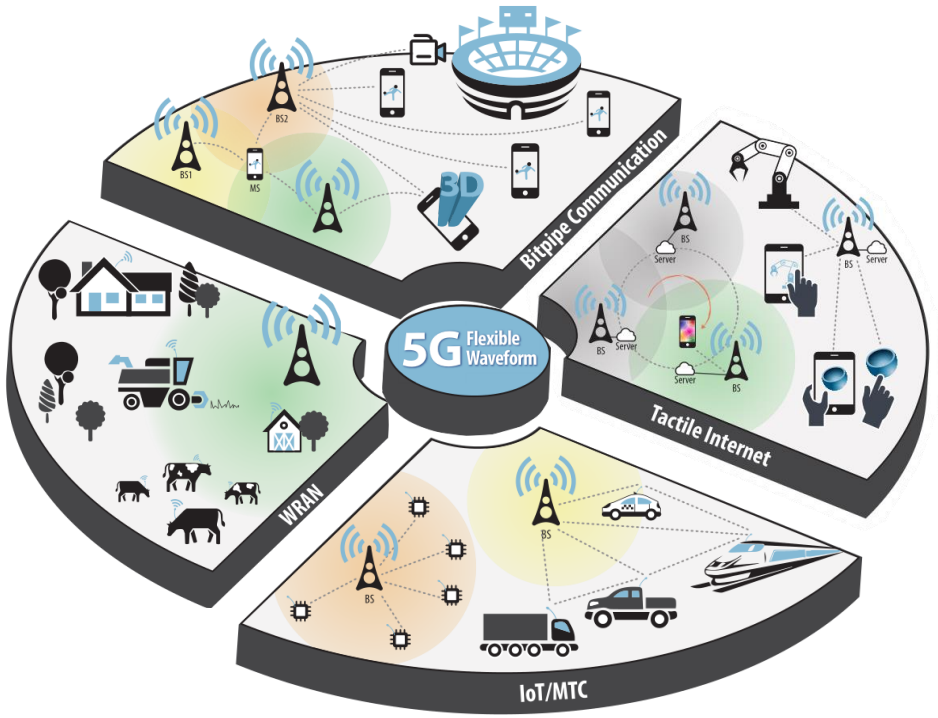


# 5G Architecture Proposal

**Enhanced Broadband**
10 Gbps with high cells density
mmWave.
Fragmented spectrum

**5G for Remote Areas**
Large coverage.
Sparse network nodes.
Scarce backhaul links.

Sub-1GHz operation
High transmission power
High propagation delay
Interference management
Integration with satellite backhaul




**Ultra-Reliable**
Latency < 1ms.
Robustness.

**Massive MTC**
Multitude of devices.
Loose synchronization.
Low energy.

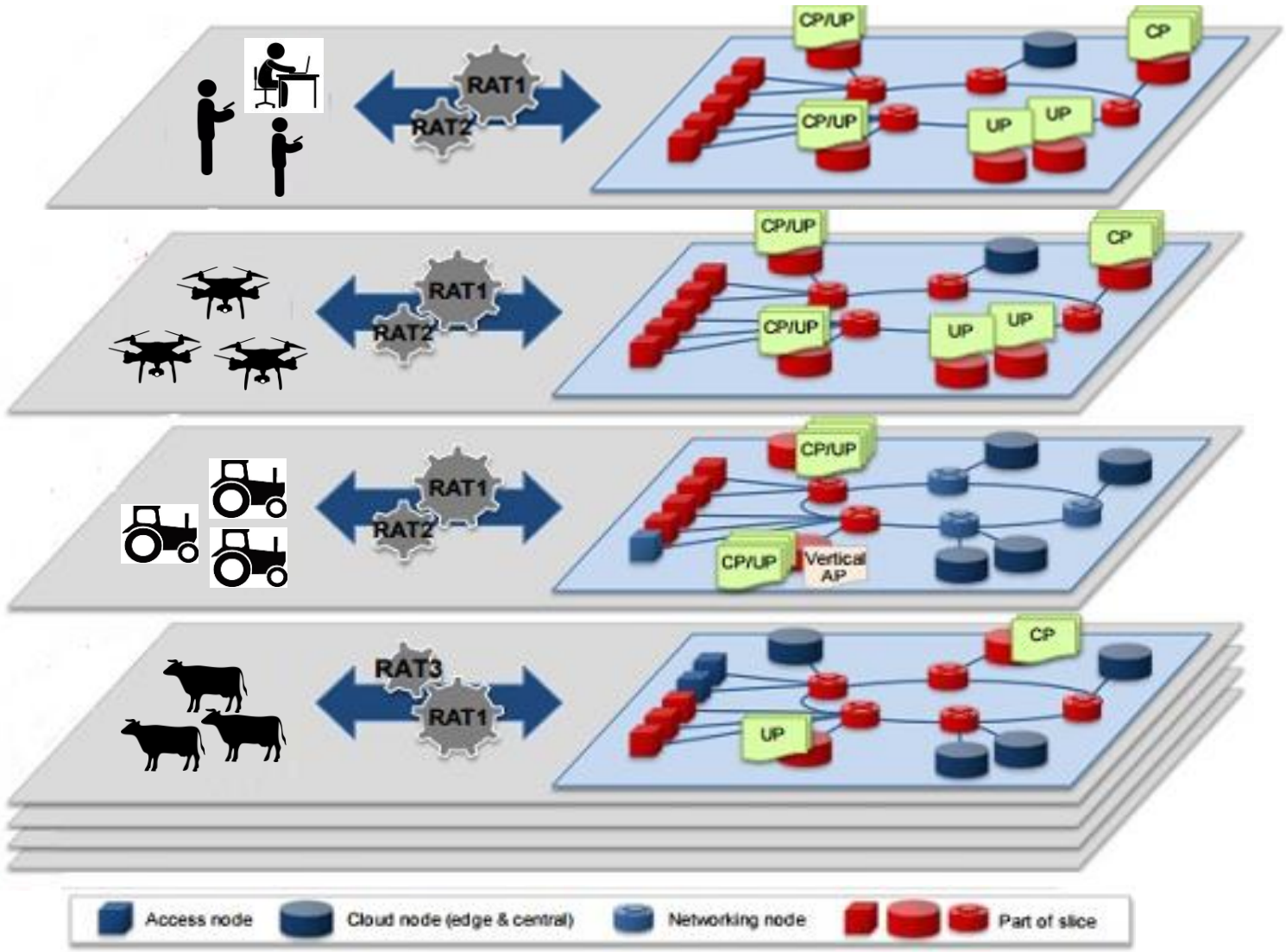
# 5G Network Slicing Scenarios

**5G Slice 1**
**(Mobile broadband access)**

**5G Slice 2**
**(High resolution mobile video)**

**5G Slice 3**
**(Real time data, voice and video)**

**5G Slice 4**
**(very low data rate, low mobility IoT)**



# Conclusions

- Remote areas is the last frontier for Internet access.
- Technology is mature and ready to provide a low cost wide coverage 5G mode.
- Several worldwide applications would benefit from 5G for remote areas:
  - ✓ Artic communication;
  - ✓ Environment monitoring;
  - ✓ Disaster monitoring.
- 5G for Remote Areas is not only applicable for the Brazilian cases!

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# Thanks for your attention!


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