

New Communication Technology Pilots for Smart Utilities and Smart Cities

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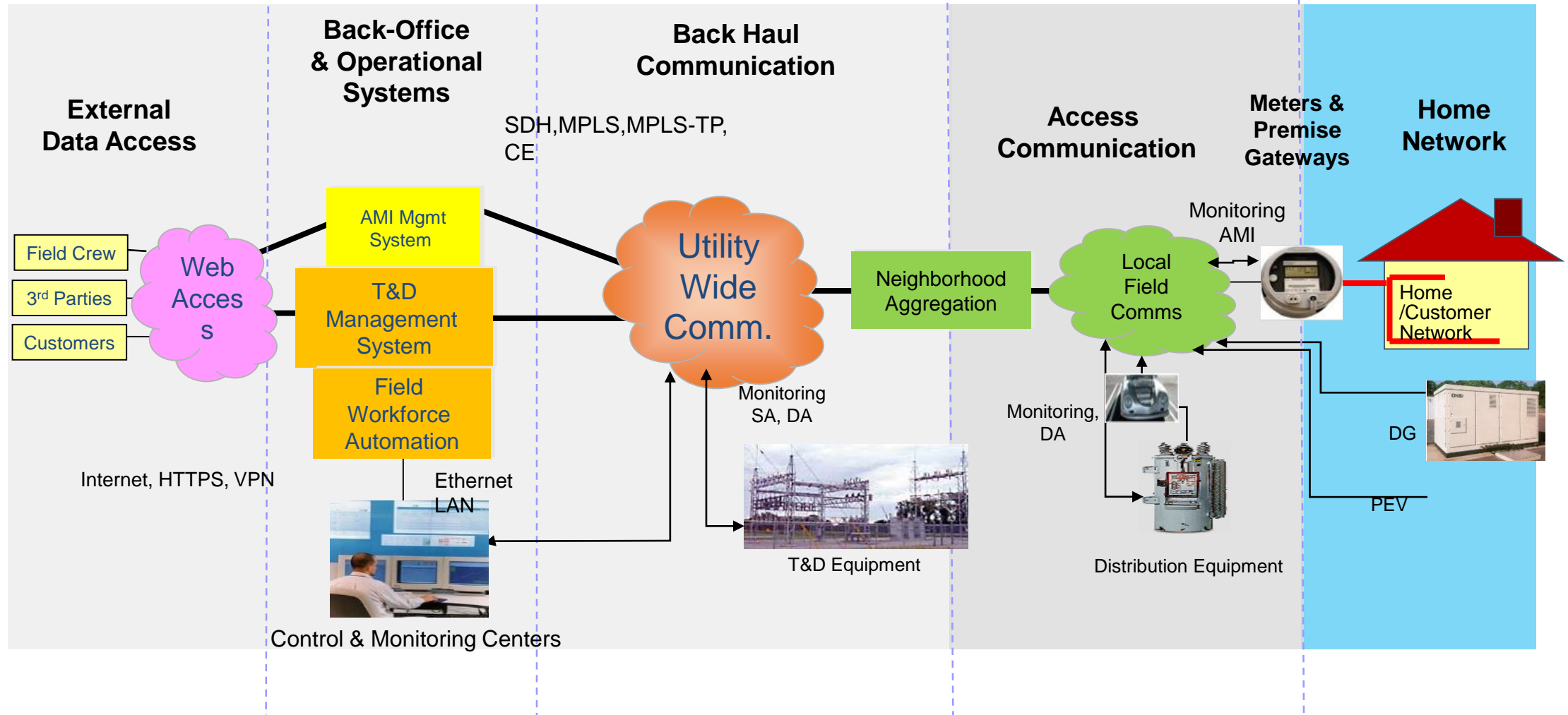
DGM, Tata Power-DDL

New Communication Technology Pilots for Smart Utilities and Smart Cities Use Cases – 5G

- ‘Integrated Vision’’ of Smart Utilities :
All components of Electricity Value Chain are intelligent, interconnected, automated
... Connected through secure and reliable Communication channel
... to ensure efficient Generation, Transmission, Distribution and Consumption of electricity
- Demanding highly diverse requirements for the communication infrastructure. This require a mix of communication technologies (e.g. 5G, Narrowband-IOT, Wireless over Wire(WoW)) each with specific use case



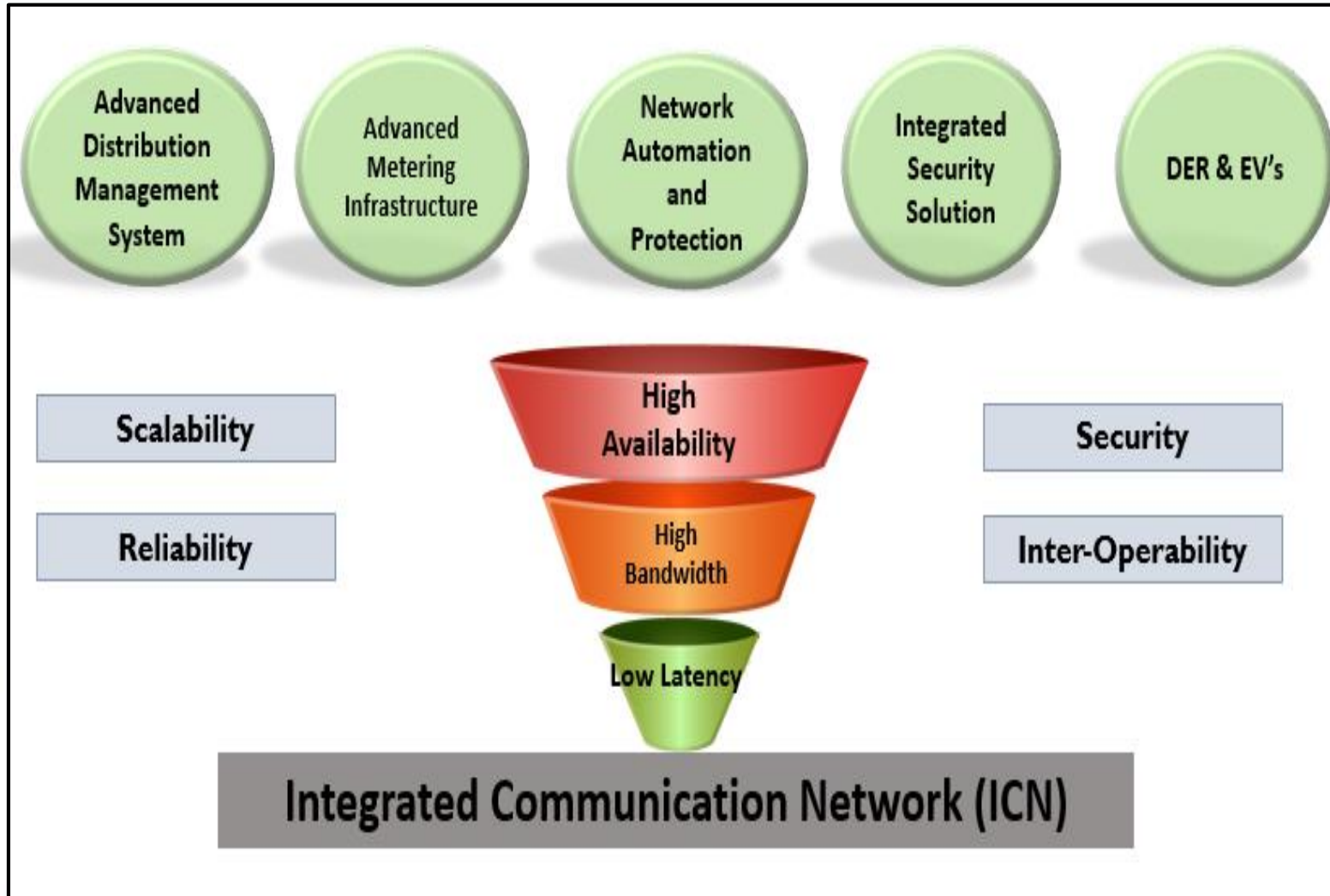
Integrated Communications architecture for Utilities



Use cases for Power Distribution Utilities are :

- Automation and optimization of grids for operational efficiency
- Distribution automation for outage and Power management
- Enabling mission critical services for Protection of electrical grid
- Field work Safety and efficiency
- Backhaul for non-OFC networks
- Replacement of Wi-Fi as a private 5G
- Smart video analytics for Remote inspection, monitoring
- Consumer empowerment

Use case & Communication requirement for Utilities



- The efficiency and reliability of a Smart Grid depends upon the choice of the ICTs adopted for various applications
- 5G adoption will help Power Utilities to increase the reliability, safety and operational efficiency while lowering operational expenses

New Communication Technology Pilots for Smart Utilities and Smart Cities Use Cases – 5G

- Key attributes of 5G are Higher Speed , Ultra reliable low latency (few msec), Massive machine type communication, High concurrency :: 5G is designed to be adaptable to different use cases
- Other attributes of 5G like Software-defined networking, Network slicing and Network Function Virtualization (NFV) make it suited for deploying various IT/OT applications

5G use cases for PoC at Tata Power-DDL are :

- Remote monitoring & control of grid sub-stations (66/33/11 kV)
- Fast response for fault isolation and service restoration through Distribution Automation
- Sub transmission protection through LDR for reliable transmission and distribution
- Cyber & Physical Security (Integrated Security Solutions)
- Smart metering Deployments
- Distributed renewables: Battery Storage & micro grids

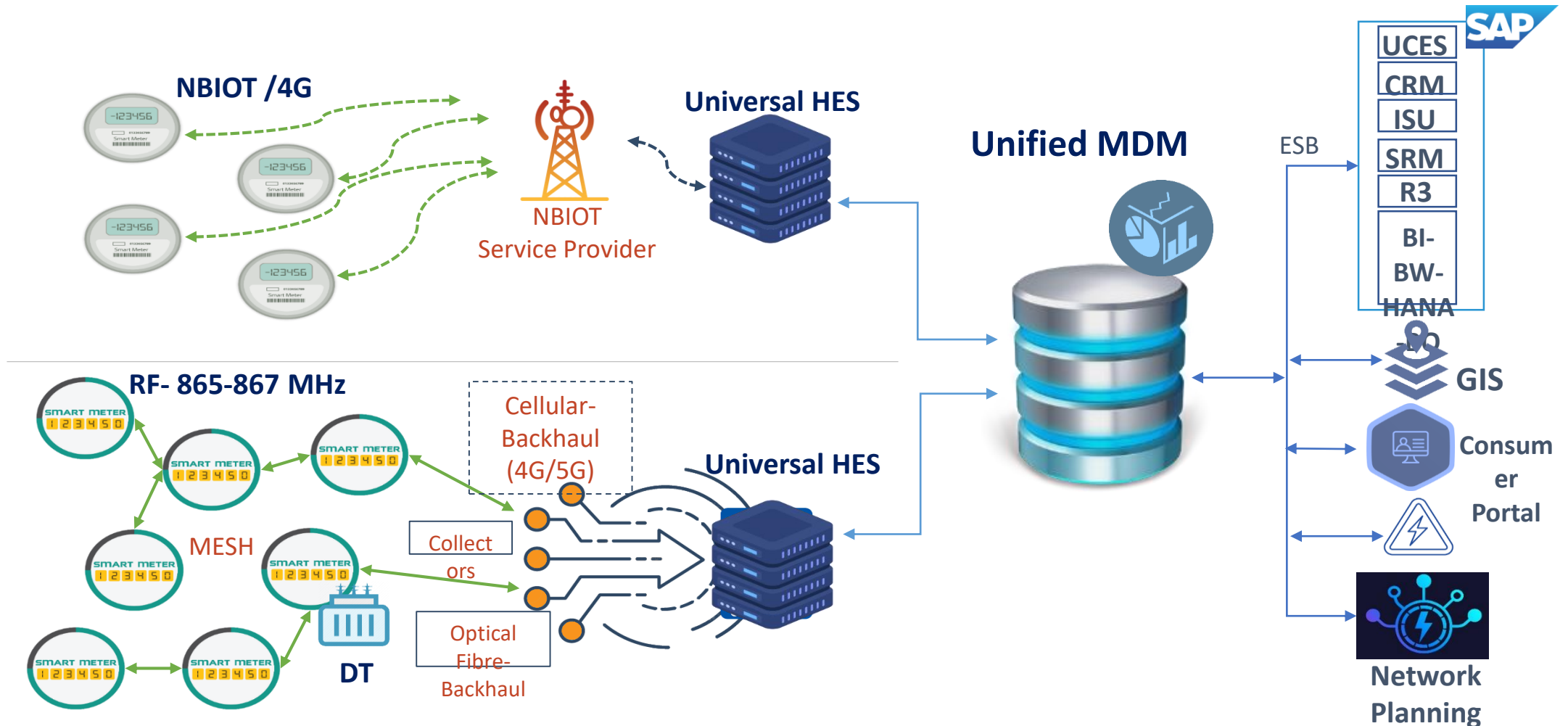
5G will act as the backbone of IoT and pave the way for the development of Smart Utilities.

NB-IOT:

LPWA technology suitable for Low latency, Low bandwidth but Long range requiring deep penetration/better coverage in basements or remote locations. Typical use cases include

- Asset tracking & monitoring
- Oil level, Temperature and Humidity Control
- Smart metering

Use Cases – 5G, NB-IoT at Tata Power DDL



Thank You

For discussions/suggestions/queries email: www.indiasmartgrid.org
www.isgw.in

Links/References

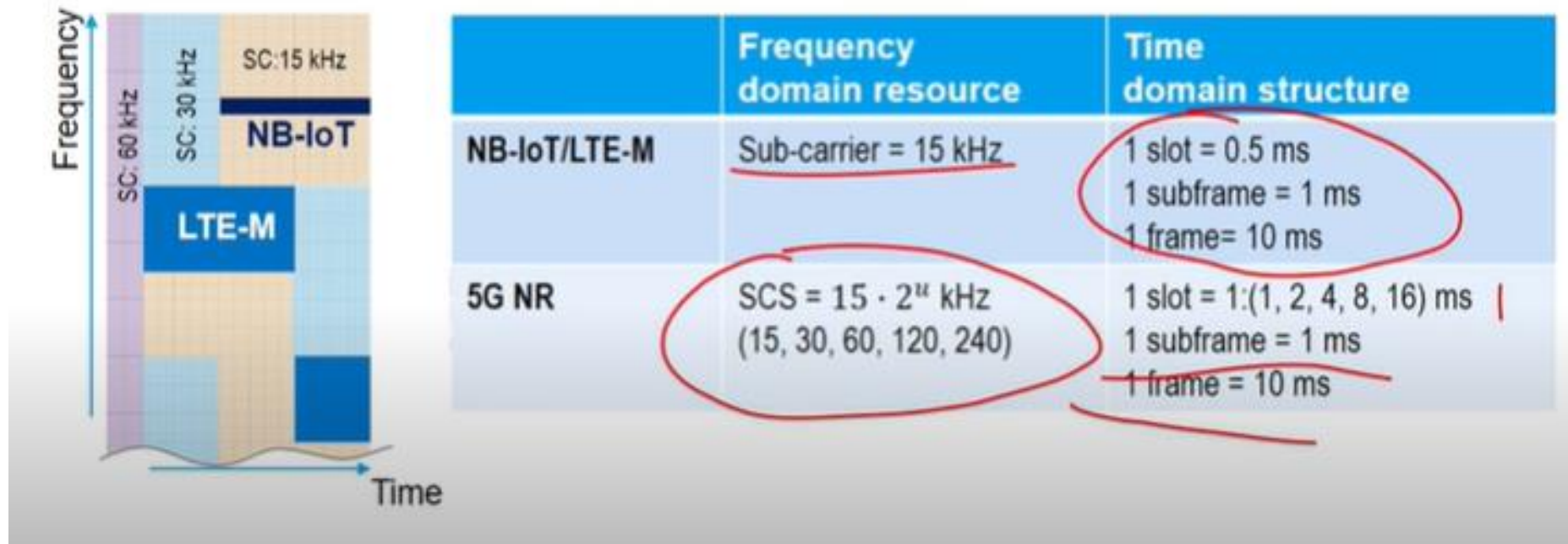
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New Communication Technology Pilots for Smart Utilities and Smart Cities Use Cases – 5G, NB-IoT, Wireless over Wire (WoW)

NB-IoT/LTE-M and 5G NR coexistence in physical layer by design

Physical layer numerologies are compatible



Source  Rohde Schwarz