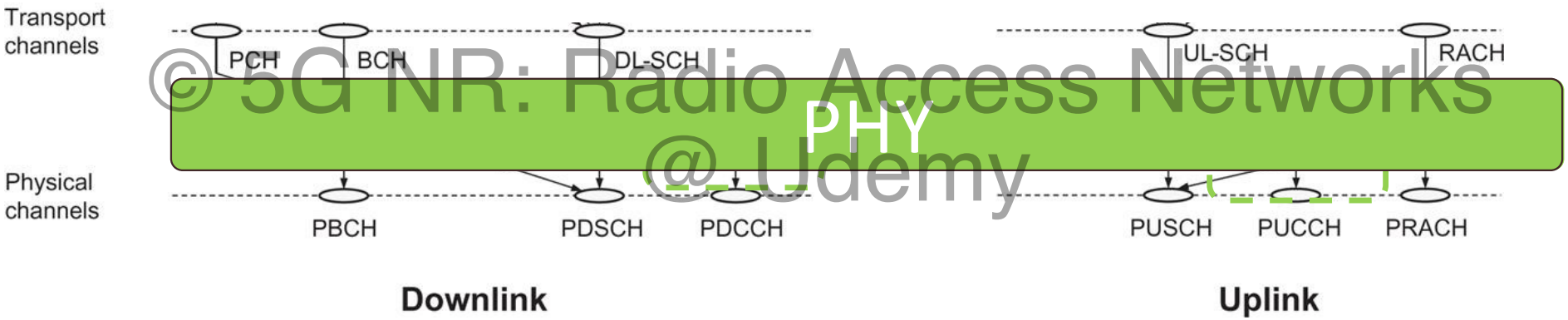
5G NR: Radio Access Networks

PHYSICAL LAYER (PHY)

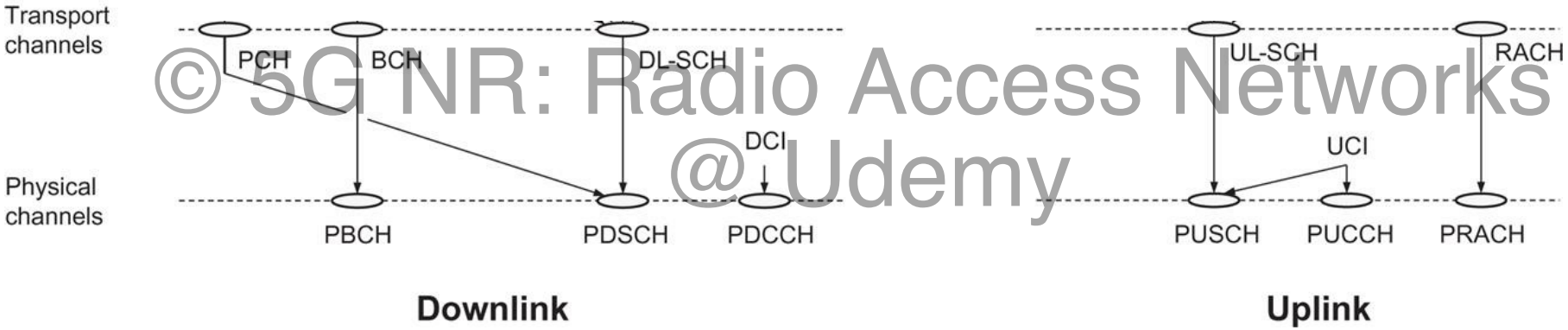
Physical Layer

"set of time–frequency resources used for transmission of a particular transport channel"



Physical Layer

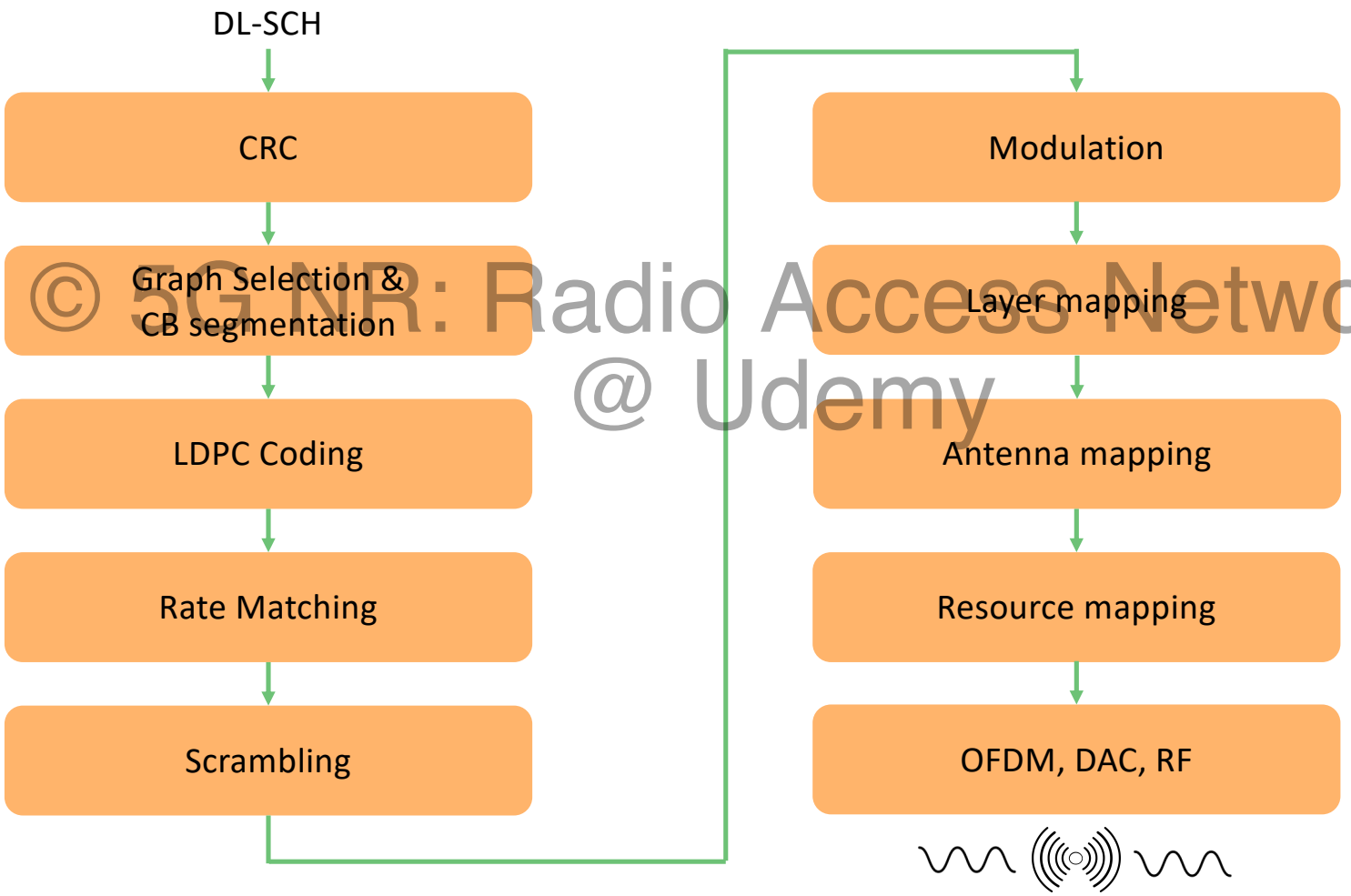
"set of time–frequency resources used for transmission of a particular transport channel"



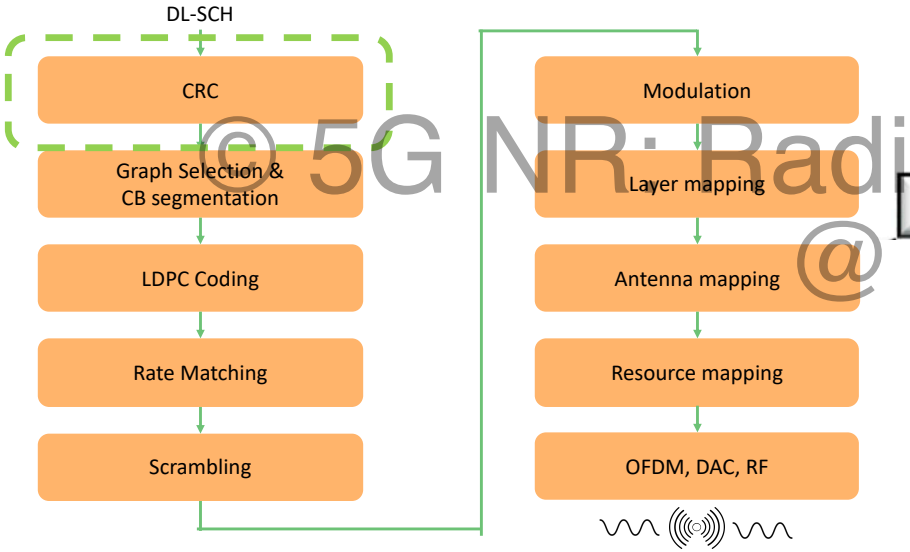
PBCH — Physical broadcast channel
PDSCH — Physical downlink shared channel
PDCCH — Physical downlink control channel

PUSCH — Physical uplink shared channel
PDCCH — Physical uplink control channel
PRACH – Physical Random Access Channel

Physical Layer

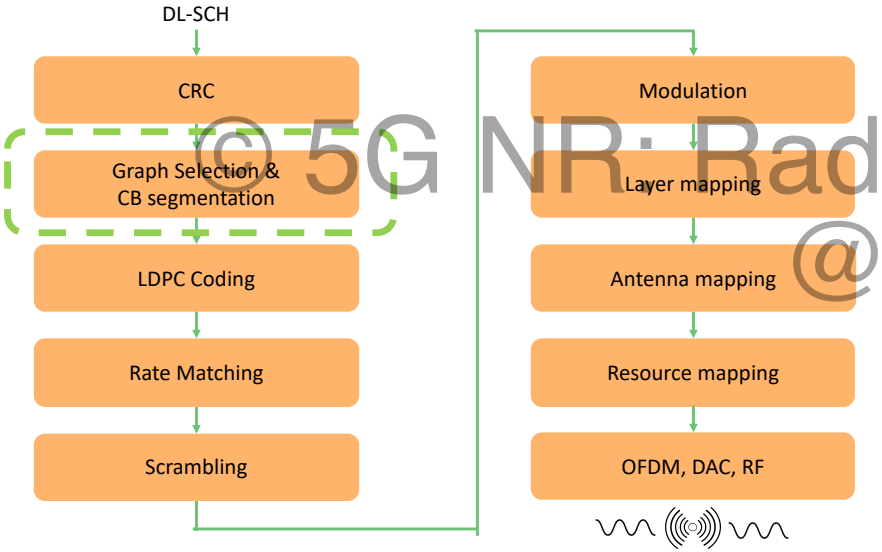


CRC



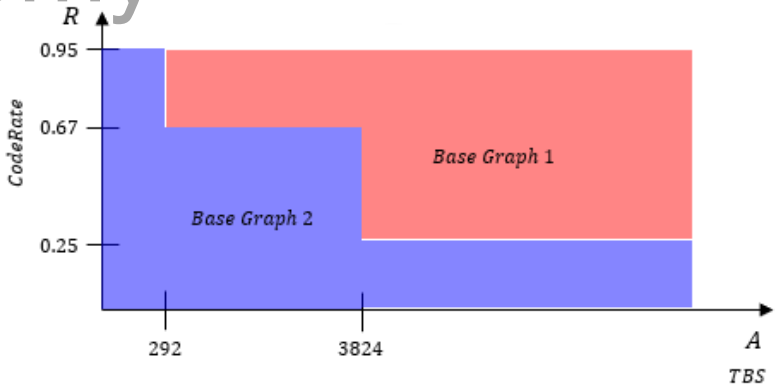
Error detection in transport block level

LDPC Graph Selection

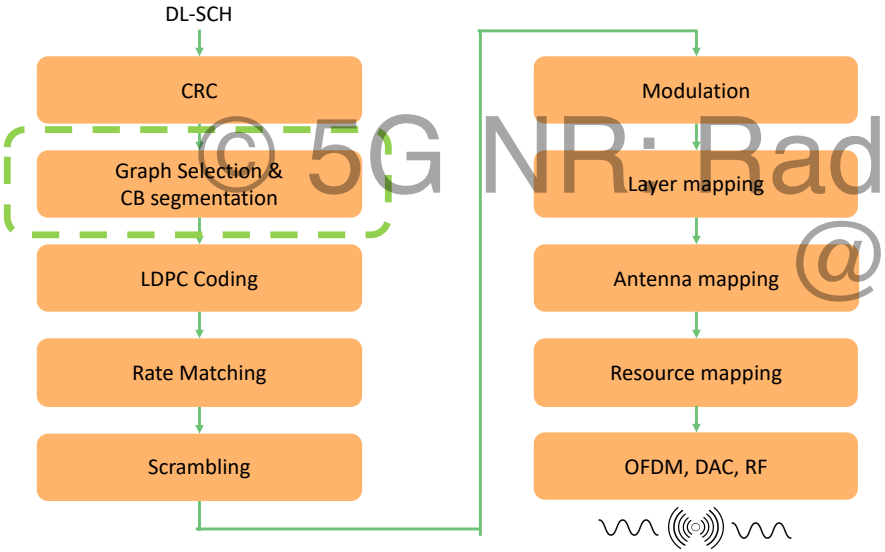


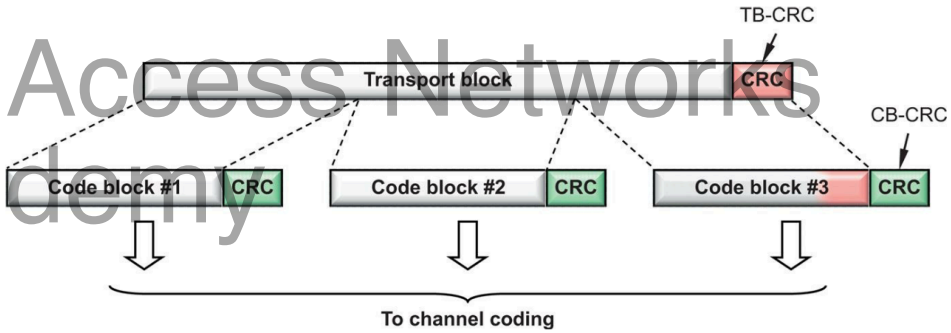
LDPC

- Transport Block Size and Code Rate
- Base Graph 1 (BG1) : With Matrix size 46X68 entries
- Base Graph 2(BG2): With matrix size 42X52 entries

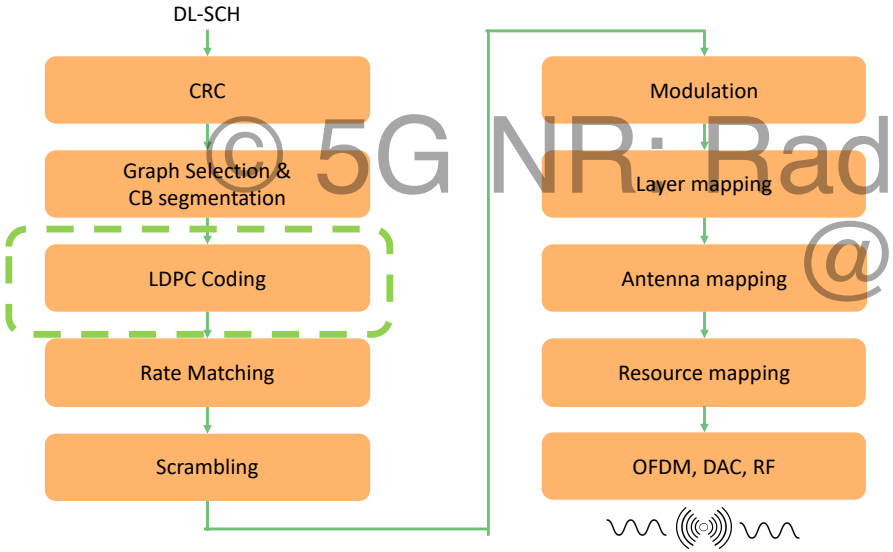


Code Block Segmentation

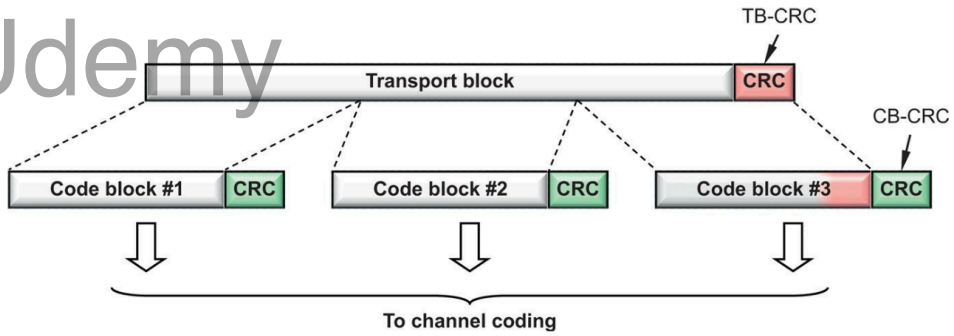




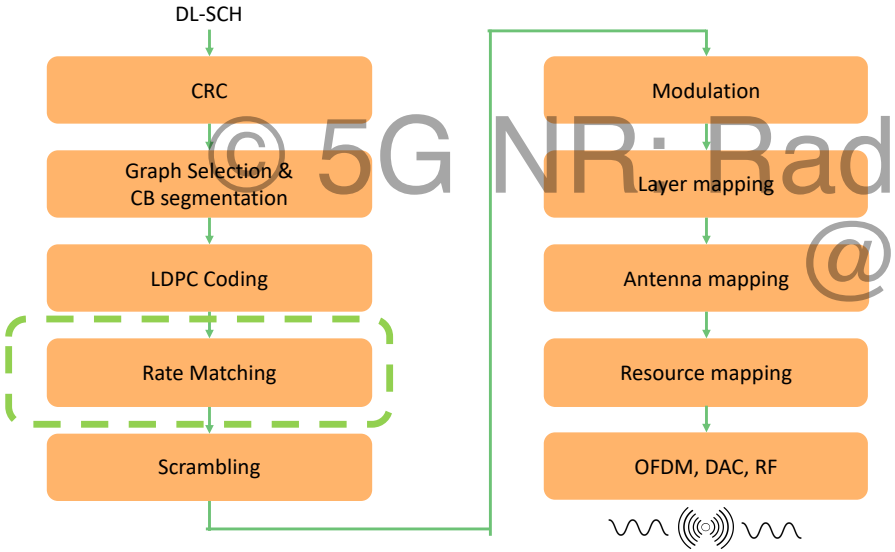
LDPC Coding



"Redundant bits to improve resiliency"

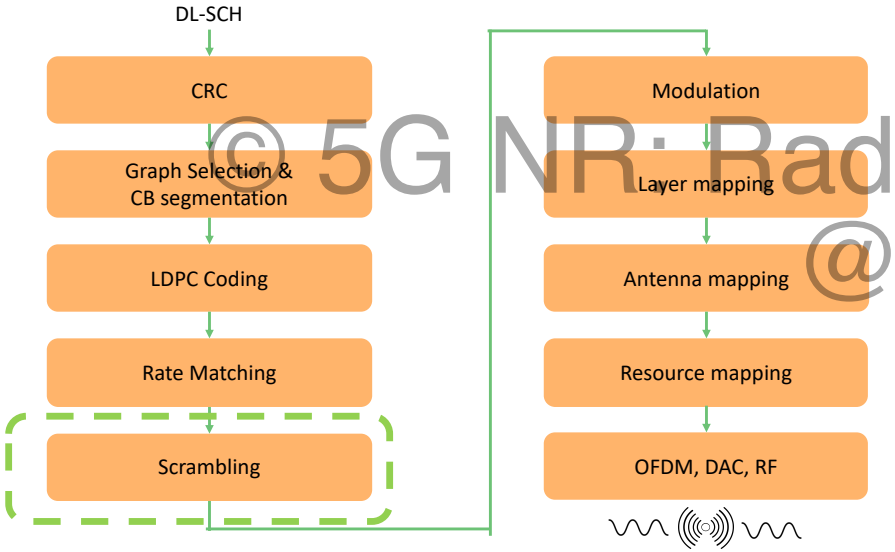


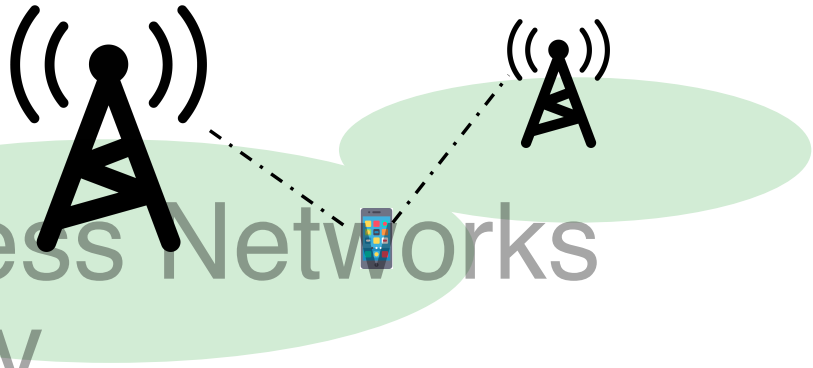
Rate Matching

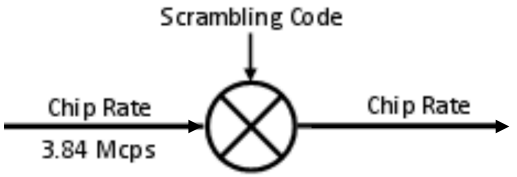


"to extracts the exact set of bits to be transmitted"

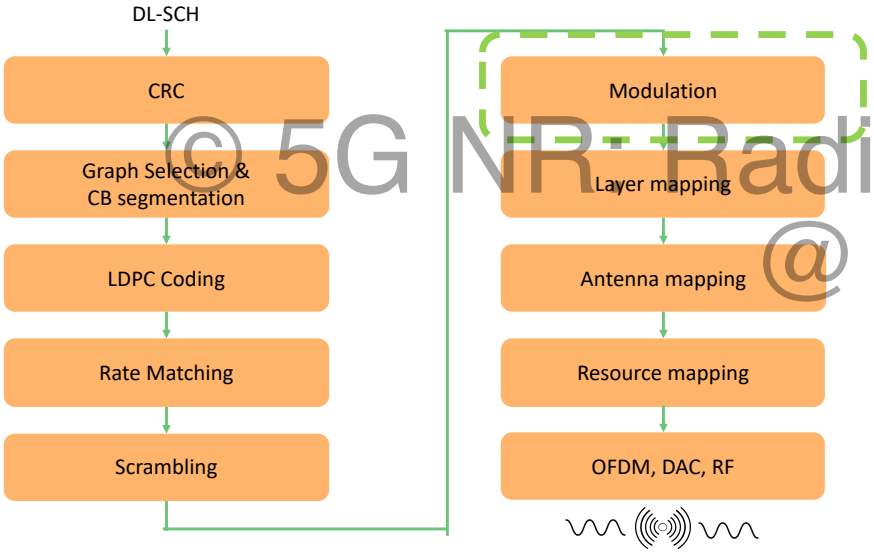
Scrambling





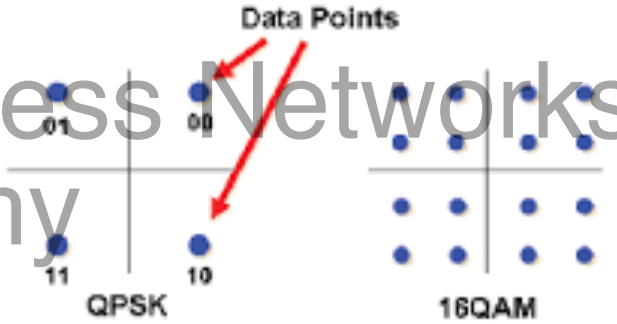


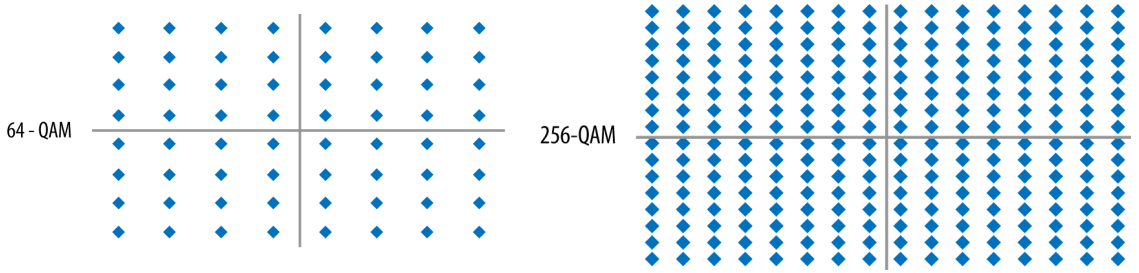
Modulation



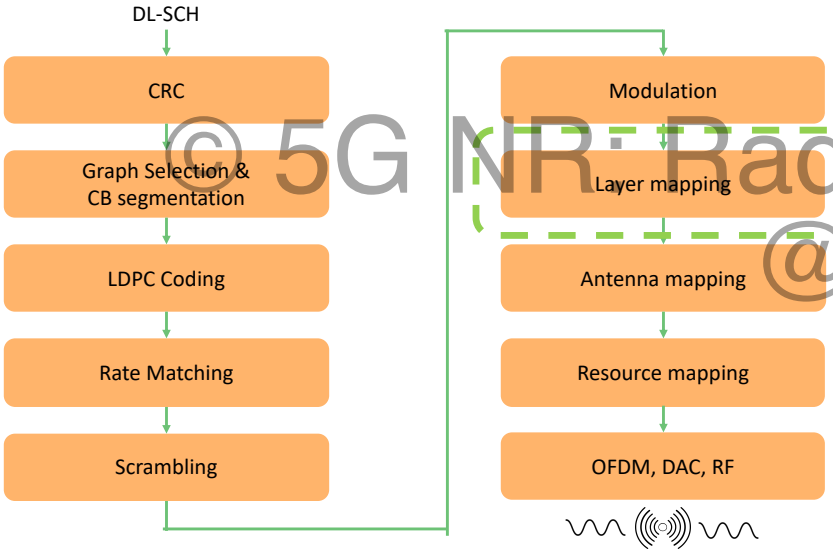
Supported modulation schemes:

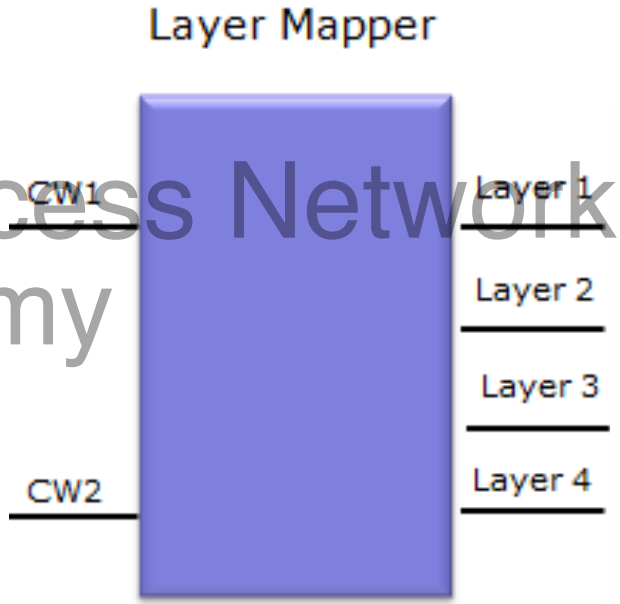
- QPSK, 16QAM, 64QAM, and 256QAM in both uplink and downlink



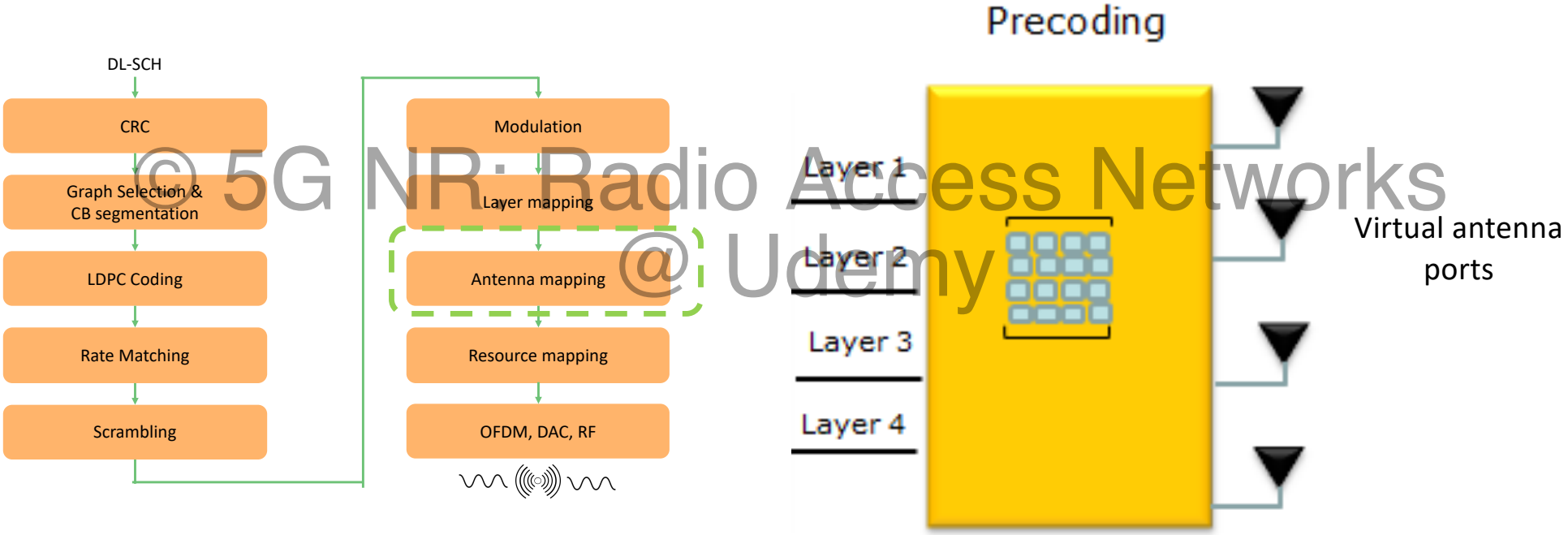


Layer Mapping

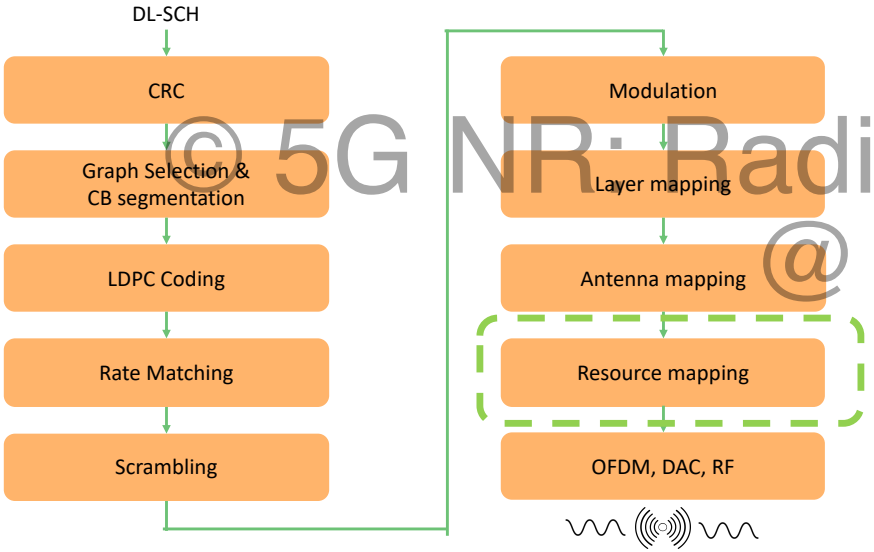


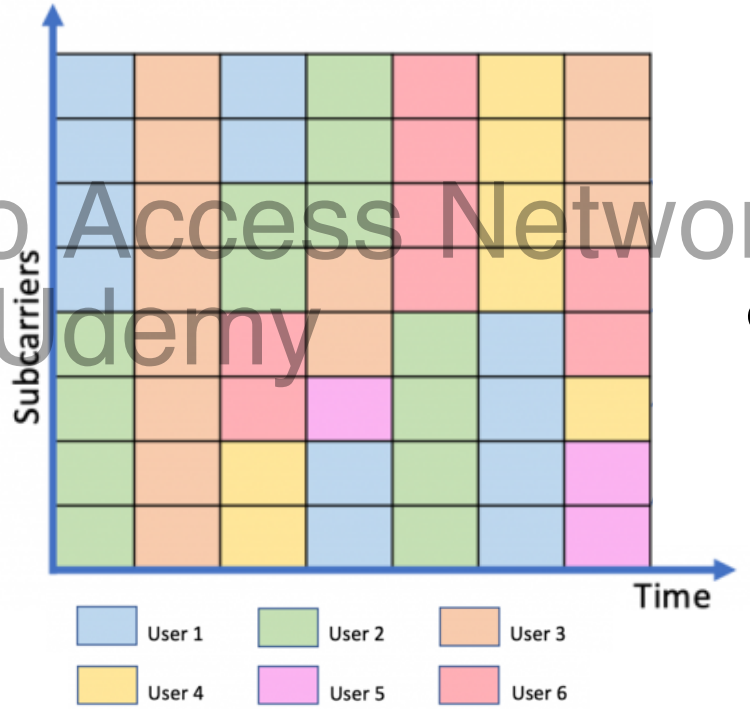


Antenna mapping and Precoding



Resource and physical antenna mapping

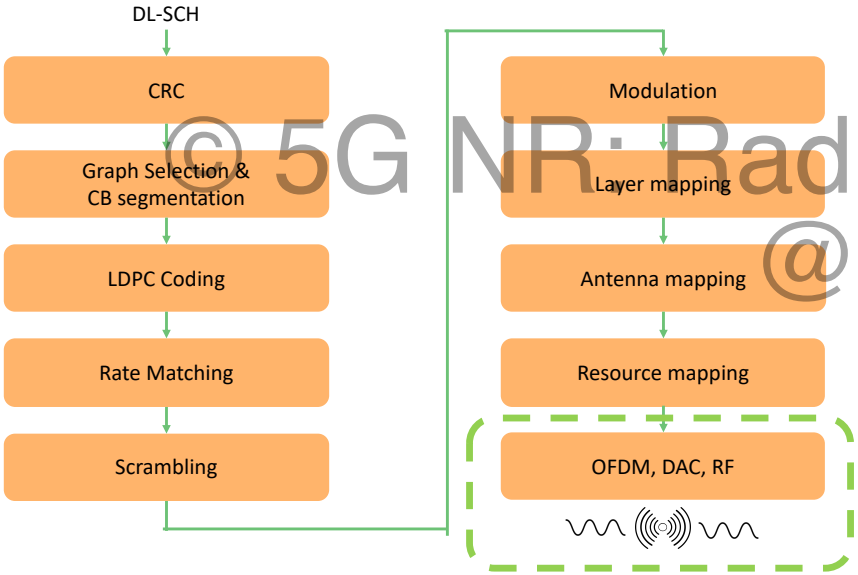


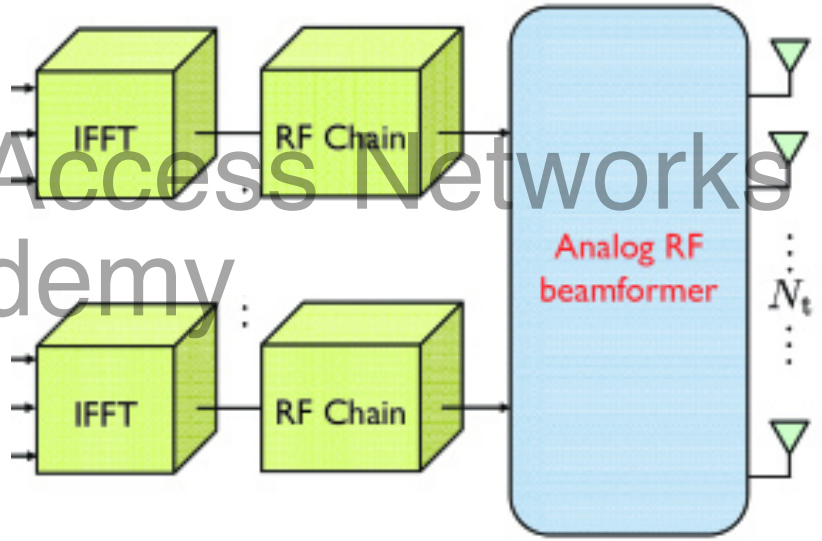


&

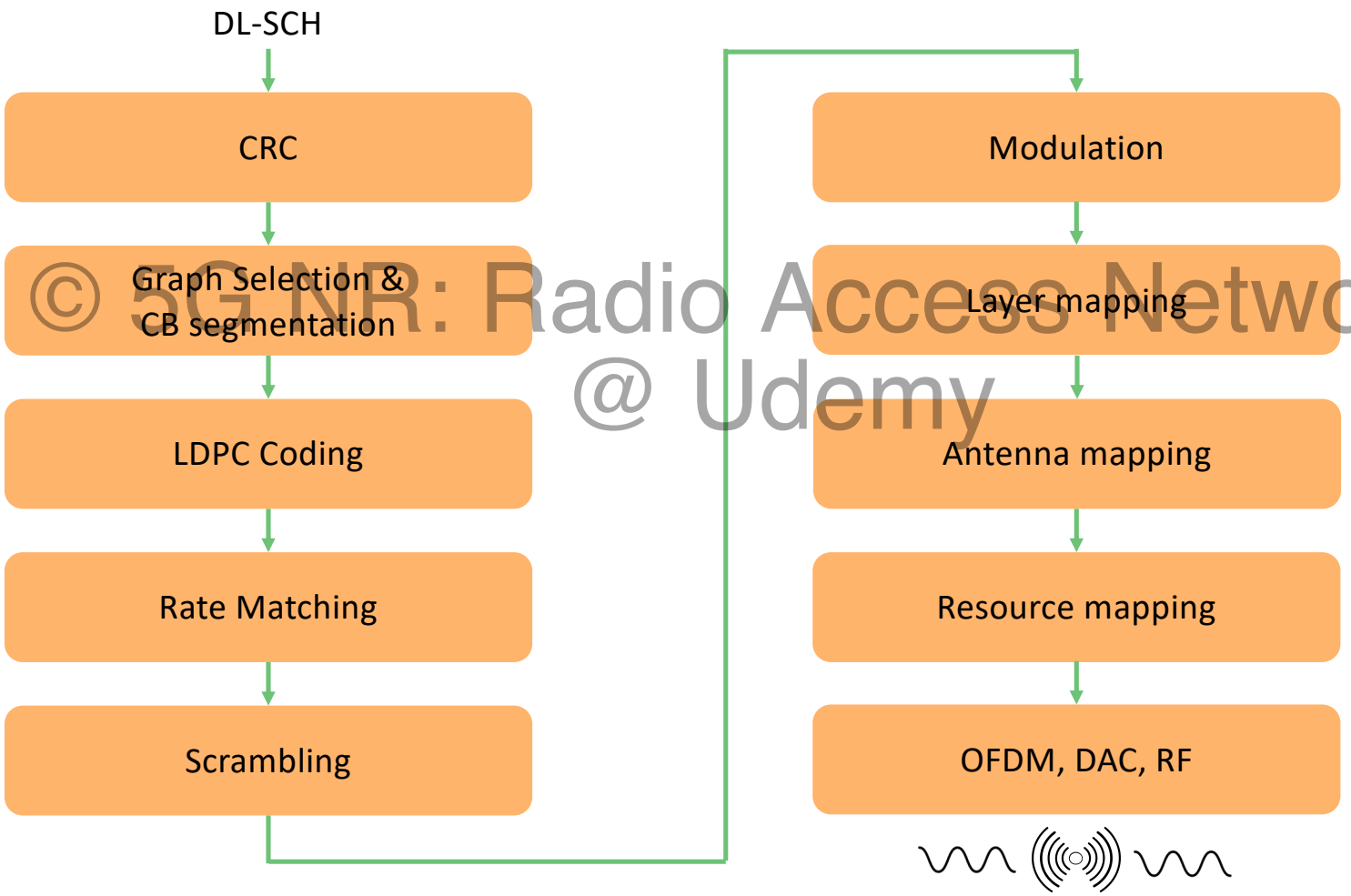
Virtual Antenna to Physical Antenna

OFDM, DAC, RF





Summary



THANK YOU