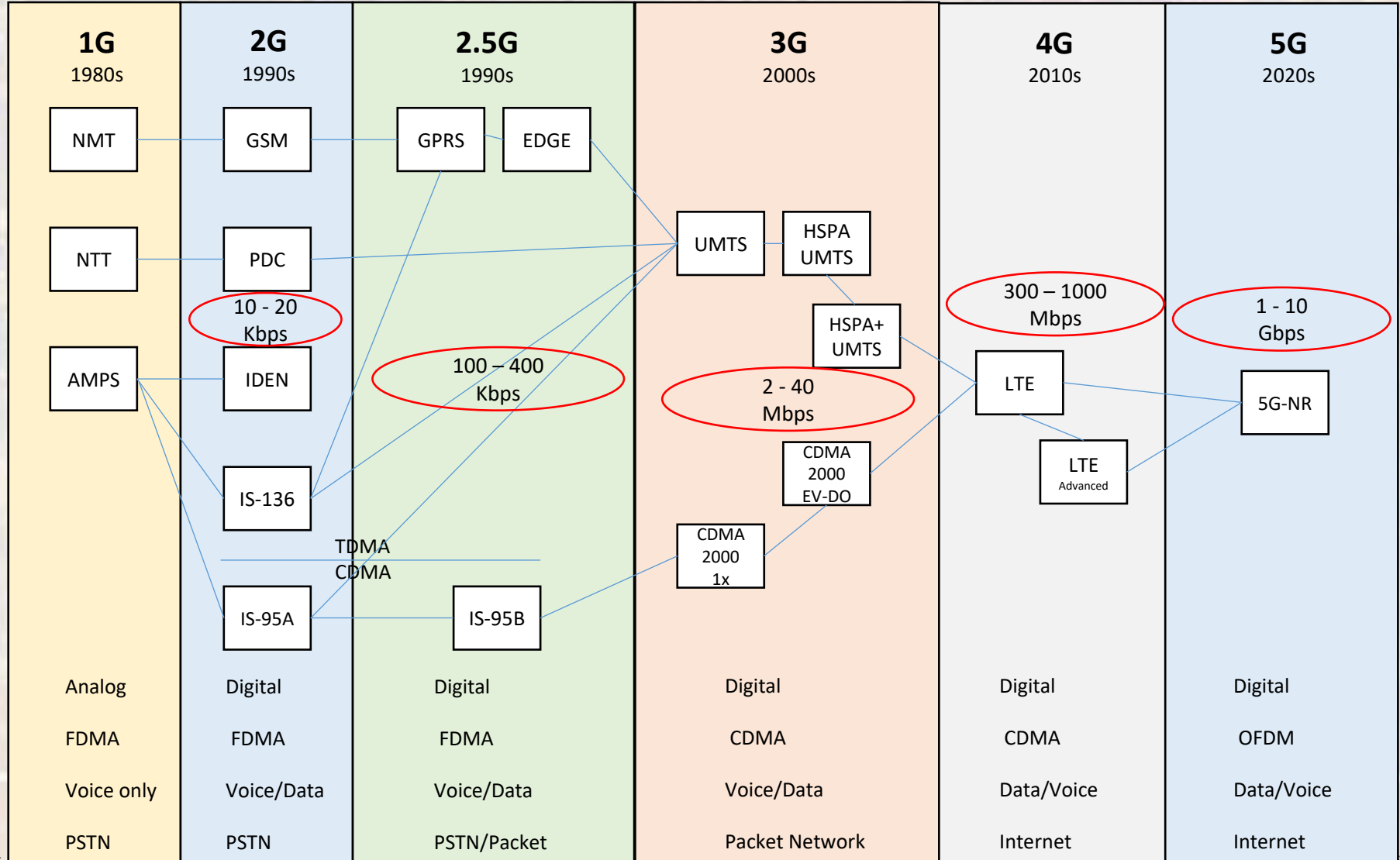


# Cellular Internet

Last updated 4/18/24

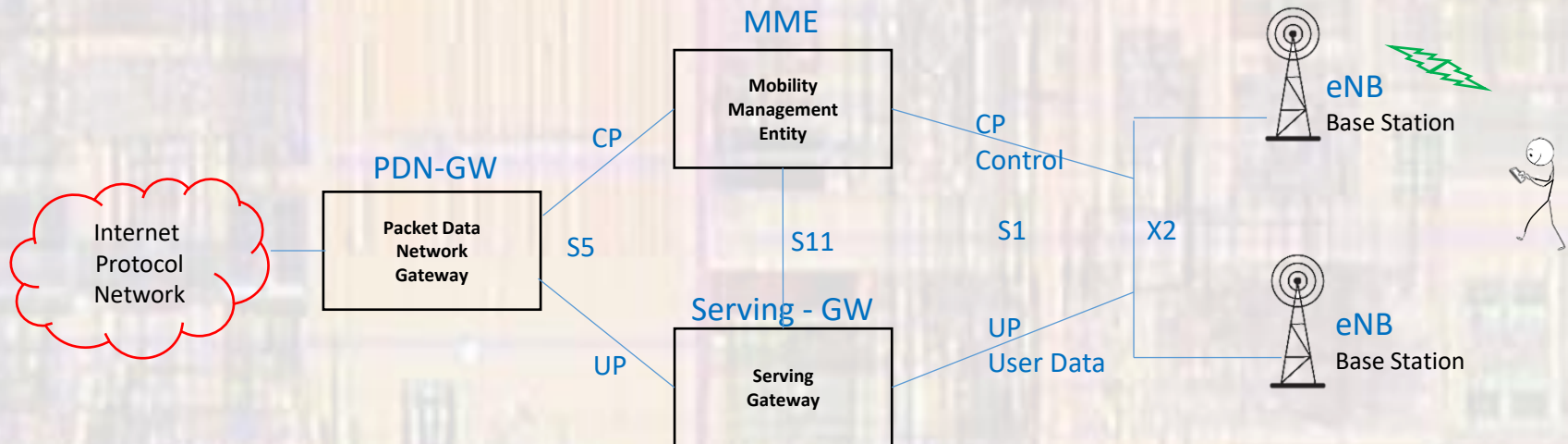
# Cellular - Background

## • Generations



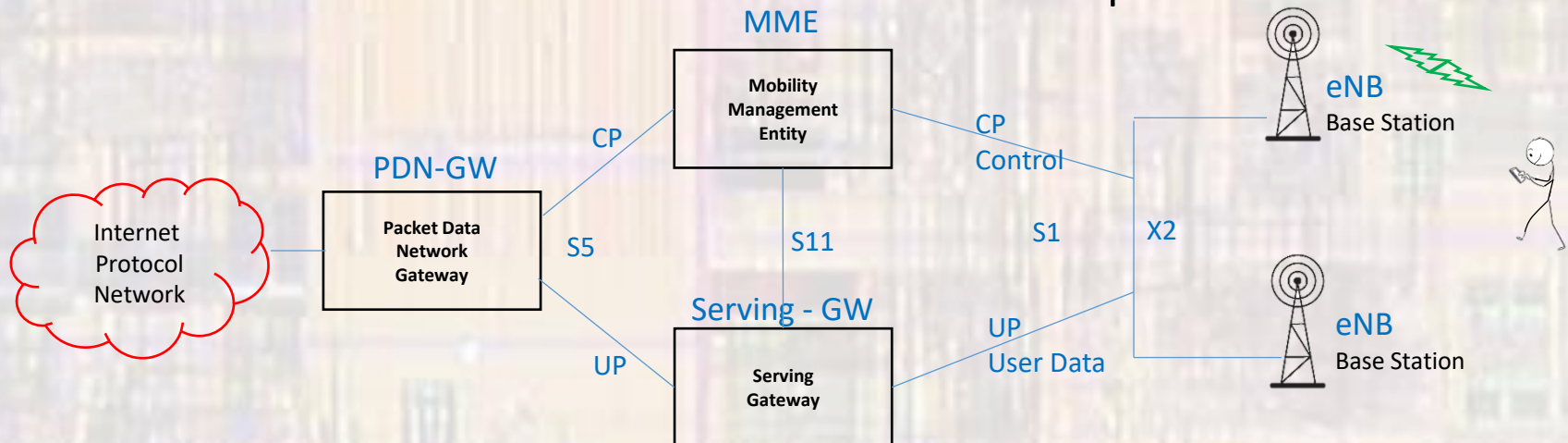
# Cellular – Internet

- LTE – 4G
  - Long term Evolution
  - UMTS Evolution
  - Aggregated carriers – multiple radio channels/user
  - Streamlined network
  - MIMO antenna structure



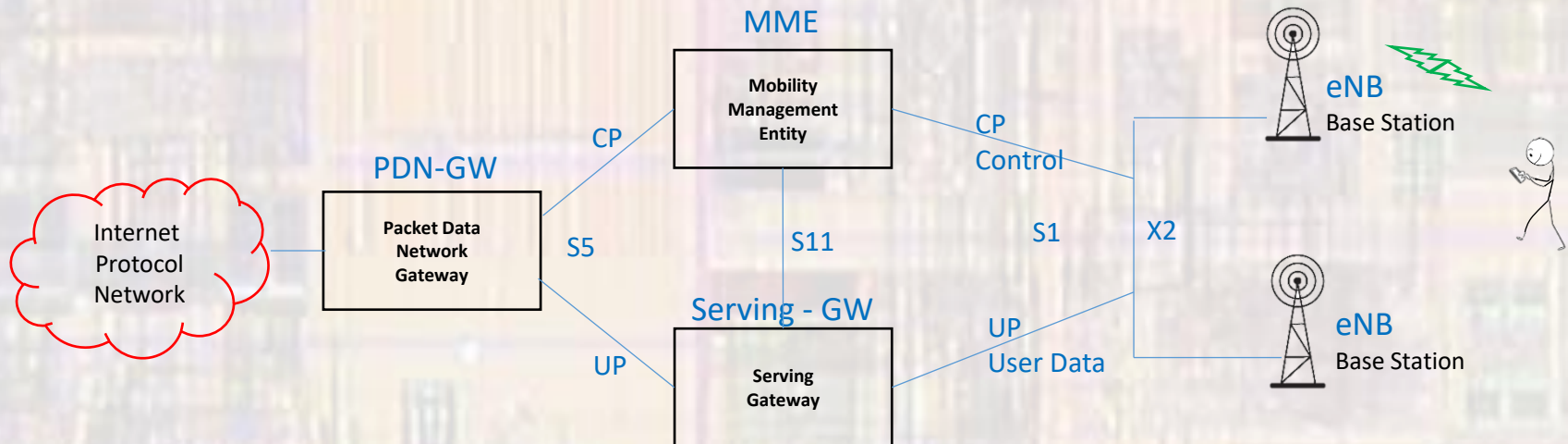
# Cellular – Internet

- LTE – 4G
  - Radio interface – Radio Access Bearer (Signaling Radio Bearer, Data Radio Bearer)
  - eNB – autonomous - integrates RNC functionality
    - Handovers, resource allocation, ...
  - S1 – fiber or microwave – 2 logical components
  - X2 – eNB to eNB communication – handover and power control



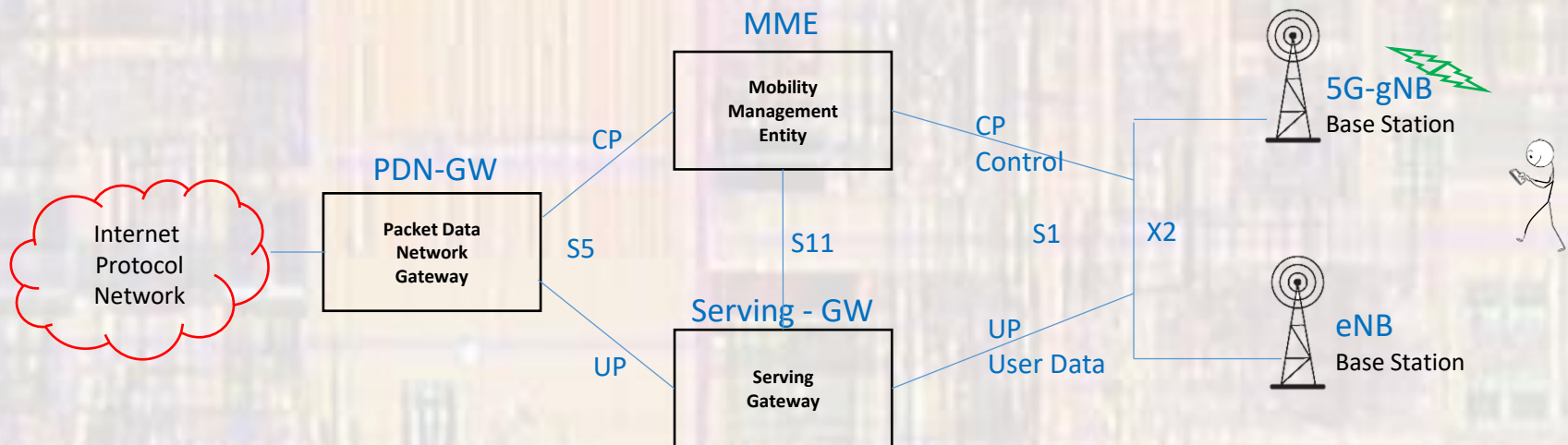
# Cellular – Internet

- LTE – 4G
  - MME – manages users, connections
  - S-GW – IP traffic management
  - PDN-GW – IP interface – assigns IP addresses, ...



# Cellular – Internet

- LTE – 5G
  - LTE evolution
  - New radio interface – OFDM
  - Higher carrier frequencies – wider bandwidth channels
  - Non-Standard version – reuses LTE network



# Cellular – Internet

- LTE – 5G
  - LTE evolution
  - New radio interface - OFDM
  - Higher carrier frequencies – wider bandwidth channels
  - 5G - Core

