MINIMUM SLOT DURATION ANALYSIS FOR NFC COMMUNICATION
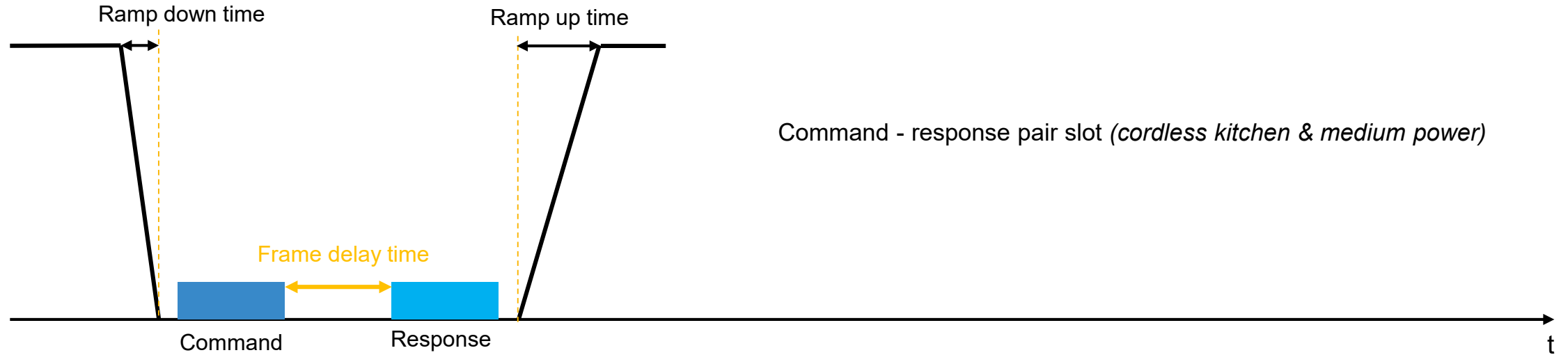
July 15th
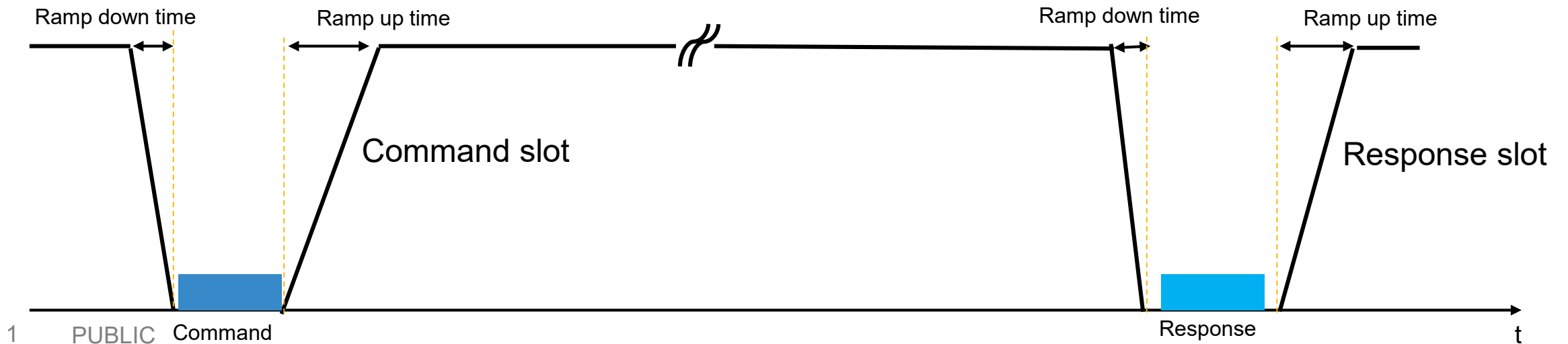
Definitions

1. CMD-RES within a single slot

Ramp down time

Ramp up time

Command - response pair slot *(cordless kitchen & medium power)*

Frame delay time

Command

Response

t

2. Dedicated slots for CMD and RES

Ramp down time

Ramp up time

Ramp down time

Ramp up time

Command slot

Response slot

Command

Response

t

Dedicated response slot duration analysis

- For WLC the response contains the longest frames (largest amount of data) – worst case
- Slot time calculation is valid for a slot containing the response only
- Constant timing parameters:
  - Ramp down time: 25μs
  - Ramp up time: 100μs
  - 10μs NFC carrier added before response for NFC carrier detection by PRx
  - 10μs NFC carrier added after response for end of frame detection by PTx

Slot duration vs. frame size
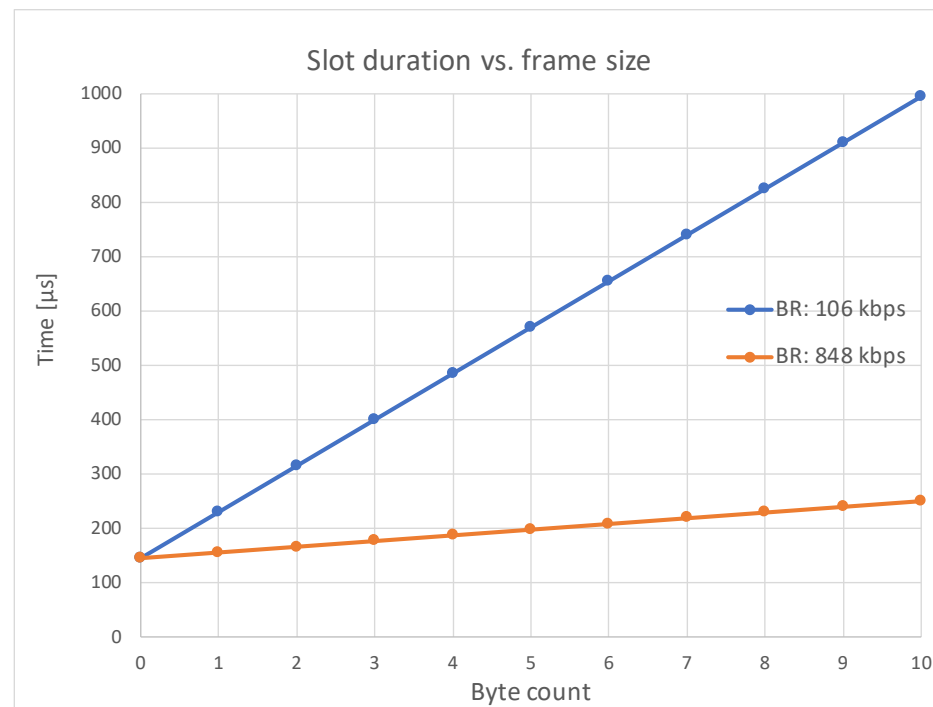
Required capacitance analysis to buffer slot duration

Block diagram:
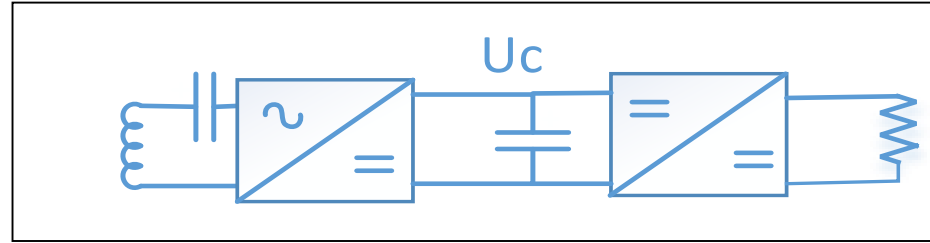
Formula's:

$$E_{cap} = \frac{P_{load}}{\eta} * t_{slot}$$

$$\frac{C}{2}\left(U_C^2(t_1) - U_C^2(t_{max})\right) = E_{cap}$$

$$C = \frac{2 * E_{cap}}{\left(U_C^2(t_1) - U_C^2(t_{max})\right)}$$

Parameter:

Parameter	value
Nominal capacitor voltage Uc t1 [V]	30
Minimum capacitor voltage Uc tmax [V]	20
Power delivered to load Pload [W]	65
Worst case DC-DC efficiency η [-]	0,9