

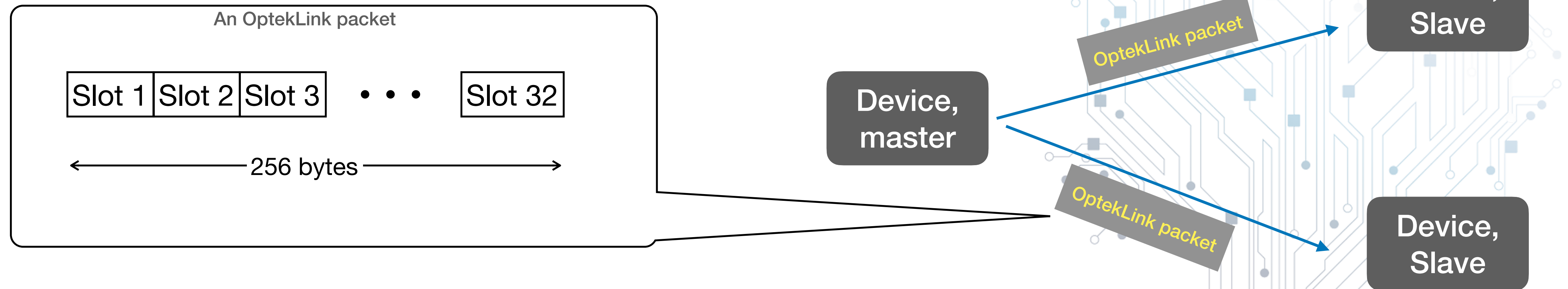
■ What is OptekLink™?

- OptekLink™ is a proprietary wireless audio protocol developed by Optek, provides a low latency for high quality audio wireless transmission
- Wireless latency of OptekLink™ can down to 10ms
- OptekLink™ works on BLE 2Mbps, BLE 4Mbps or 5.8GHz
- OptekLink™ can co-exist with classic Bluetooth (except 5.8GHz)
- It is suitable for time critical audio applications

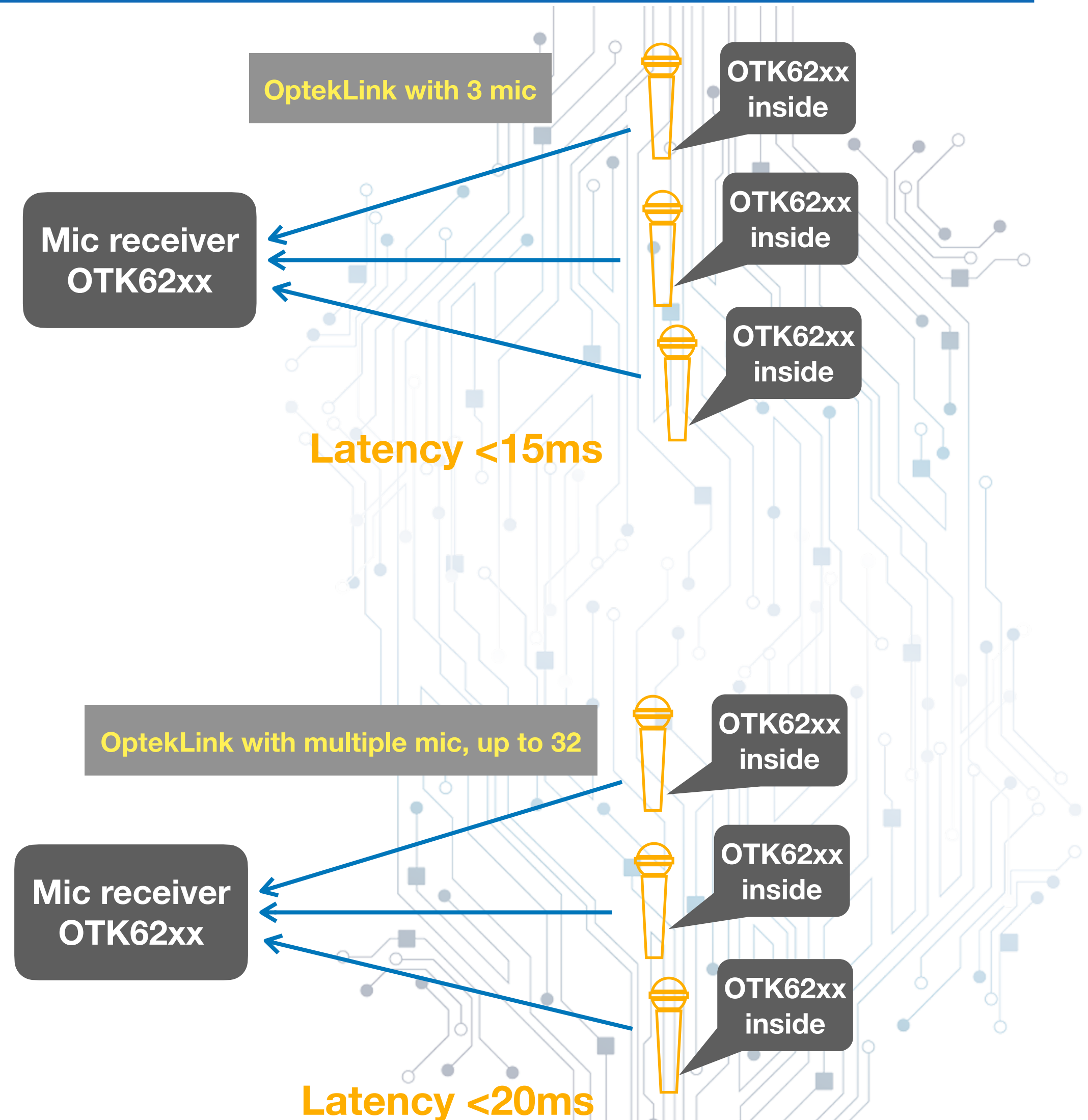
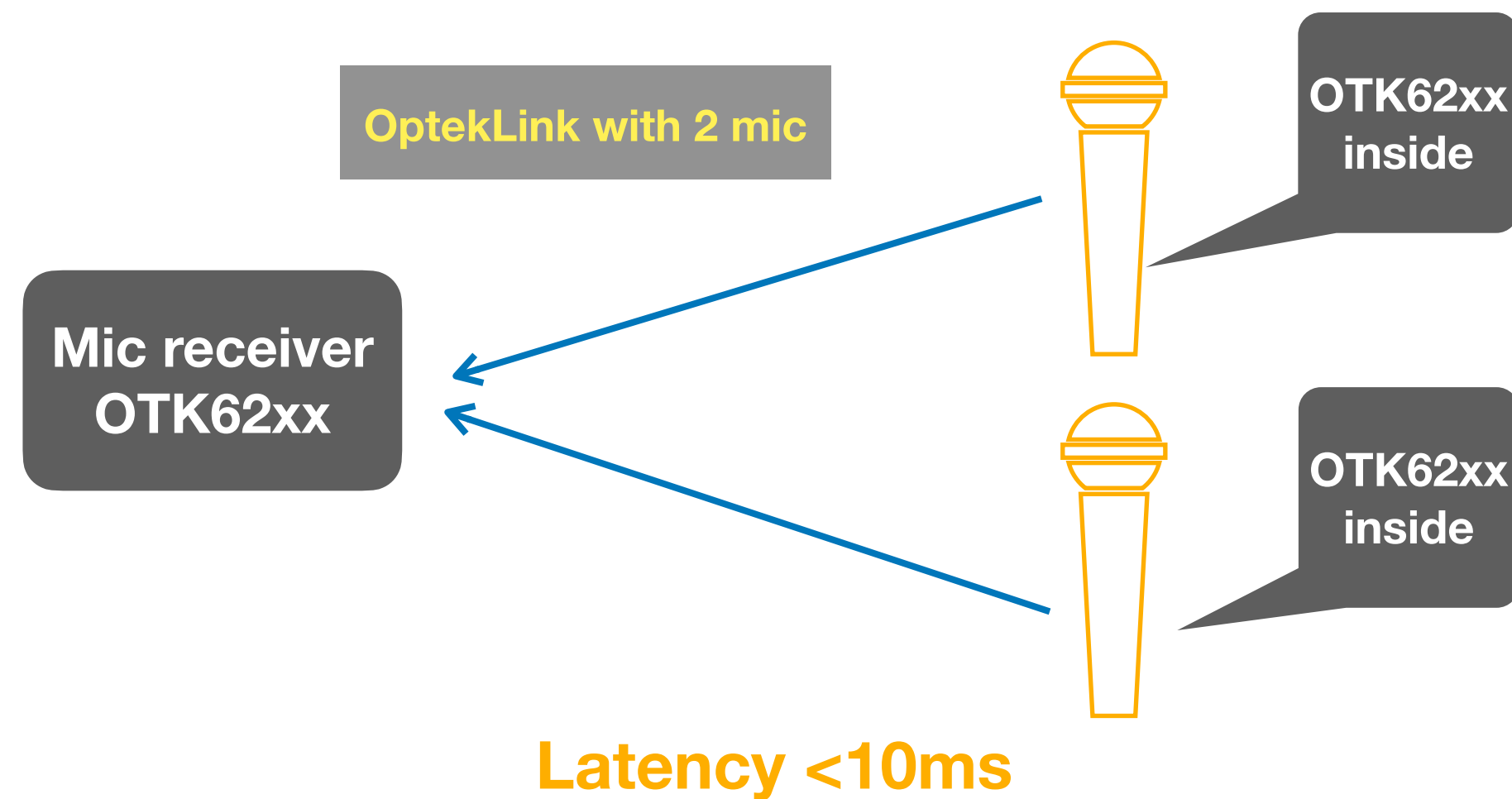
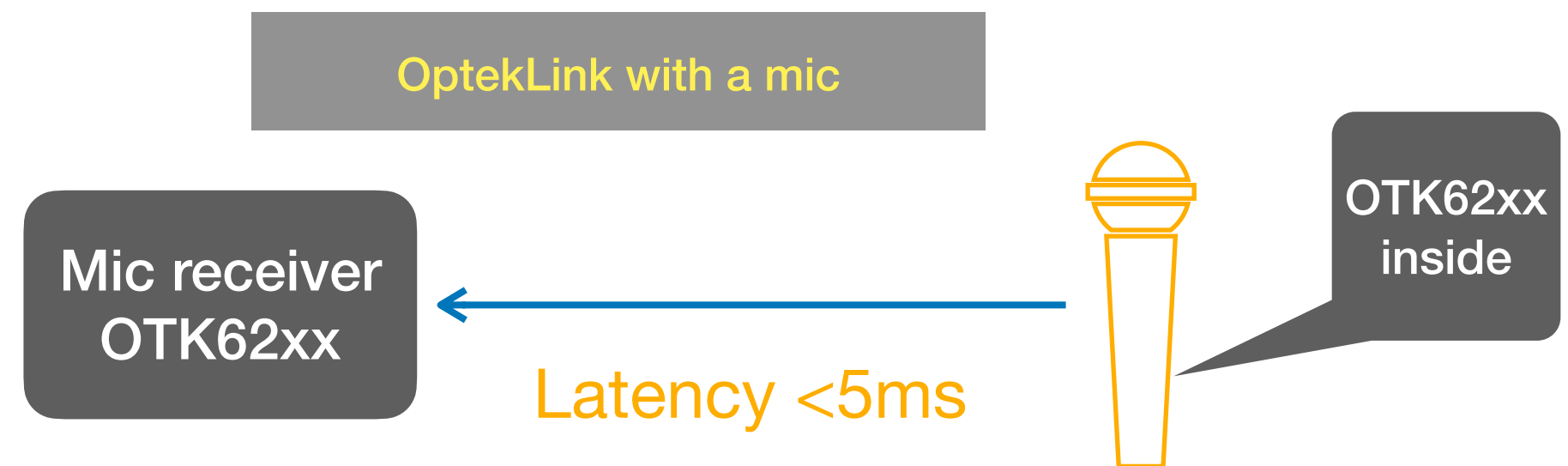


2 OptekLink™ Topology

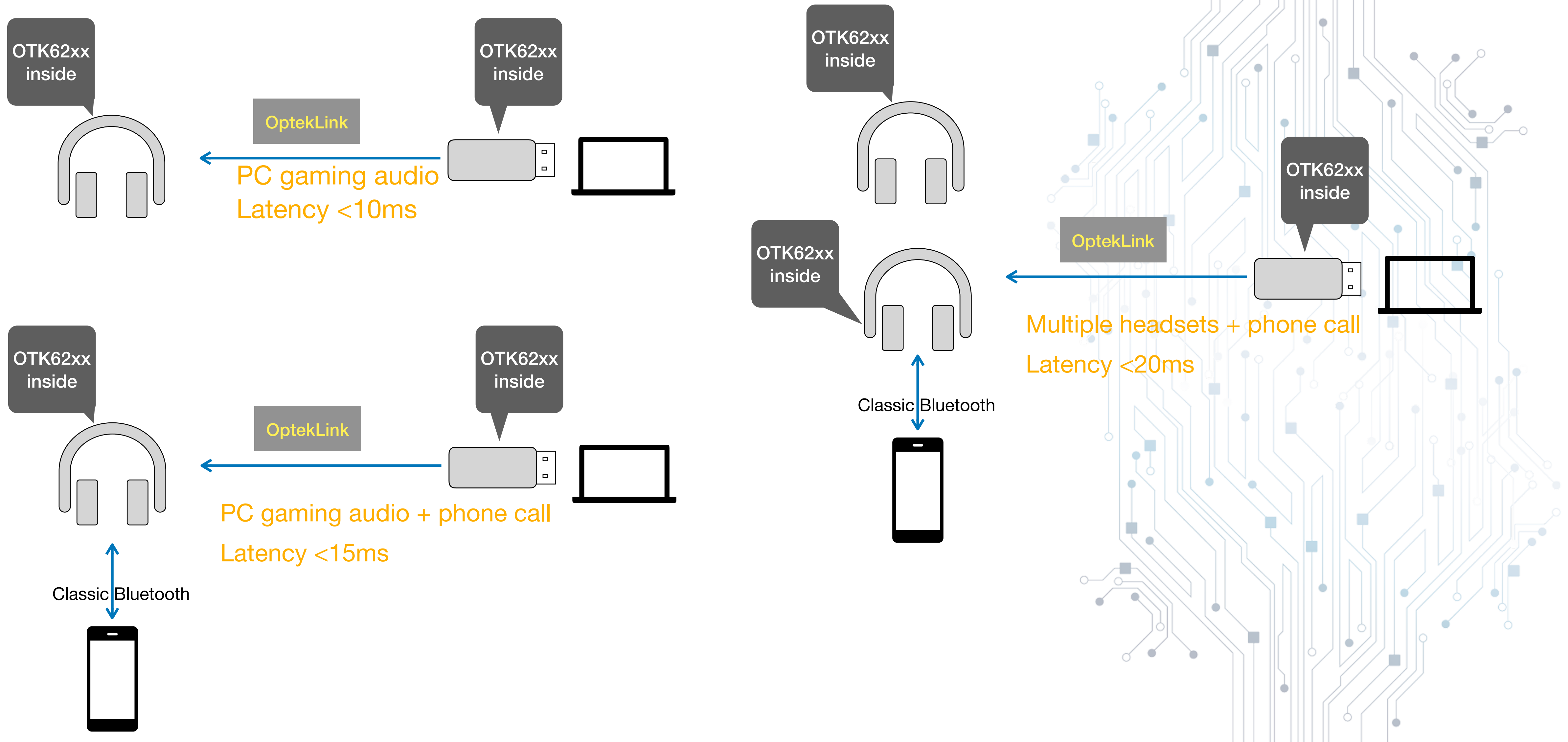
- In OptekLink topology, each device is either master or slave.
- There is only 1 master but multiple slaves at a time, and it is the master who initiate the connection
- Each data packet is 256 bytes max with 32 slots, and each slot can be either Tx, Rx or NOP
- At physical layer, frequency hopping is used with Packet Loss Concealment
- Slave device sync. clock with Master device



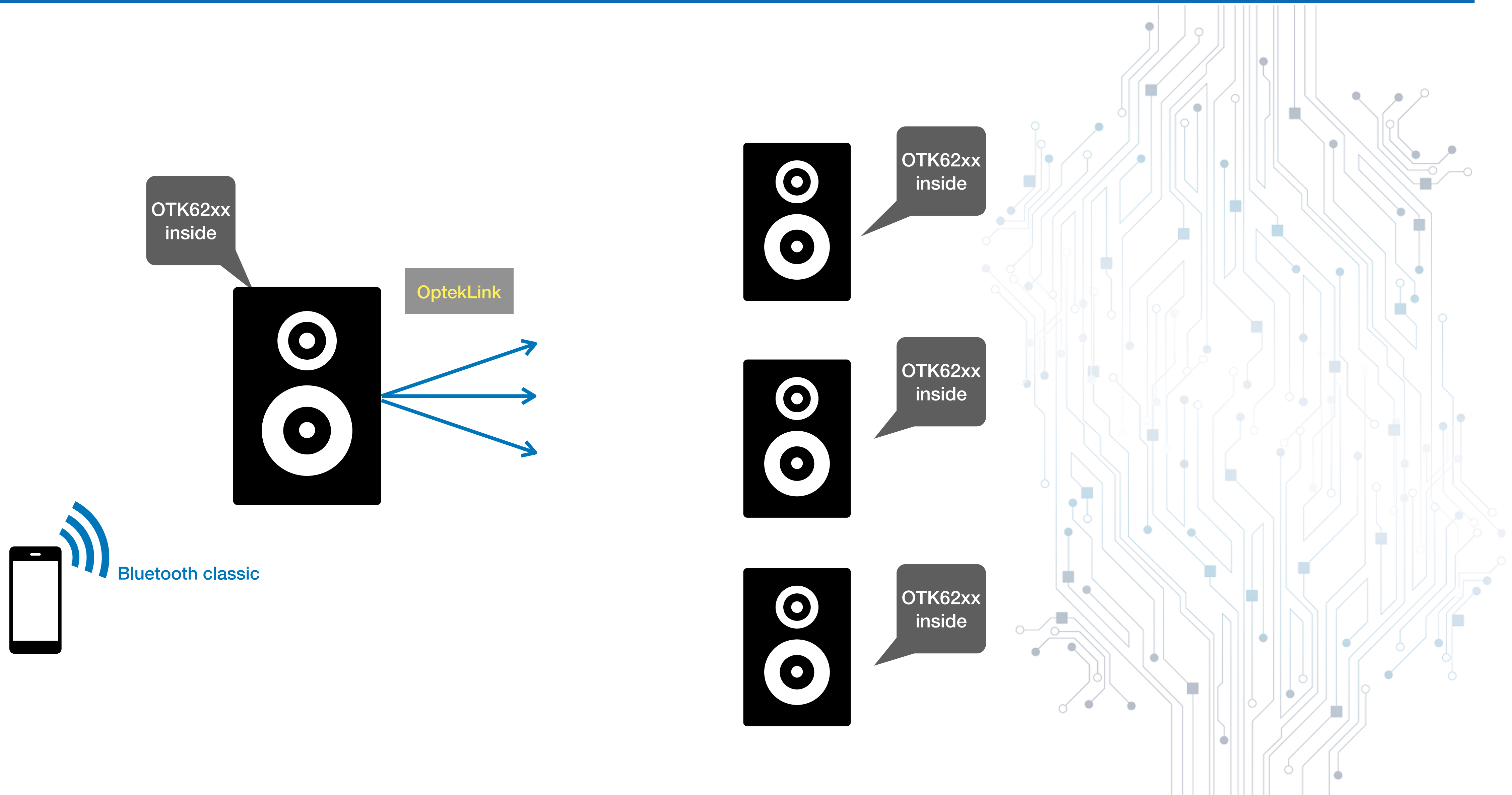
3 OptekLink™ wireless mic application



4 OptekLink™ gaming headset application

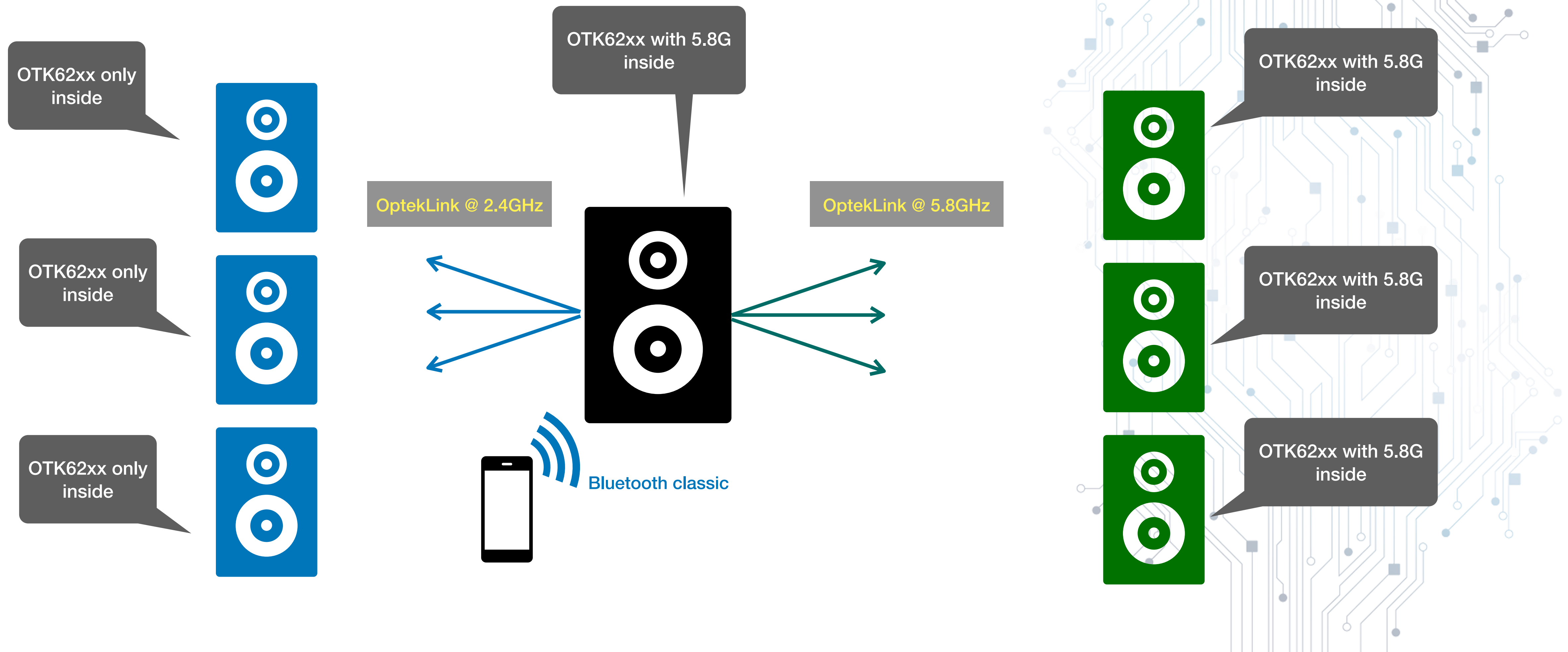


5 OptekLink™ speakers application



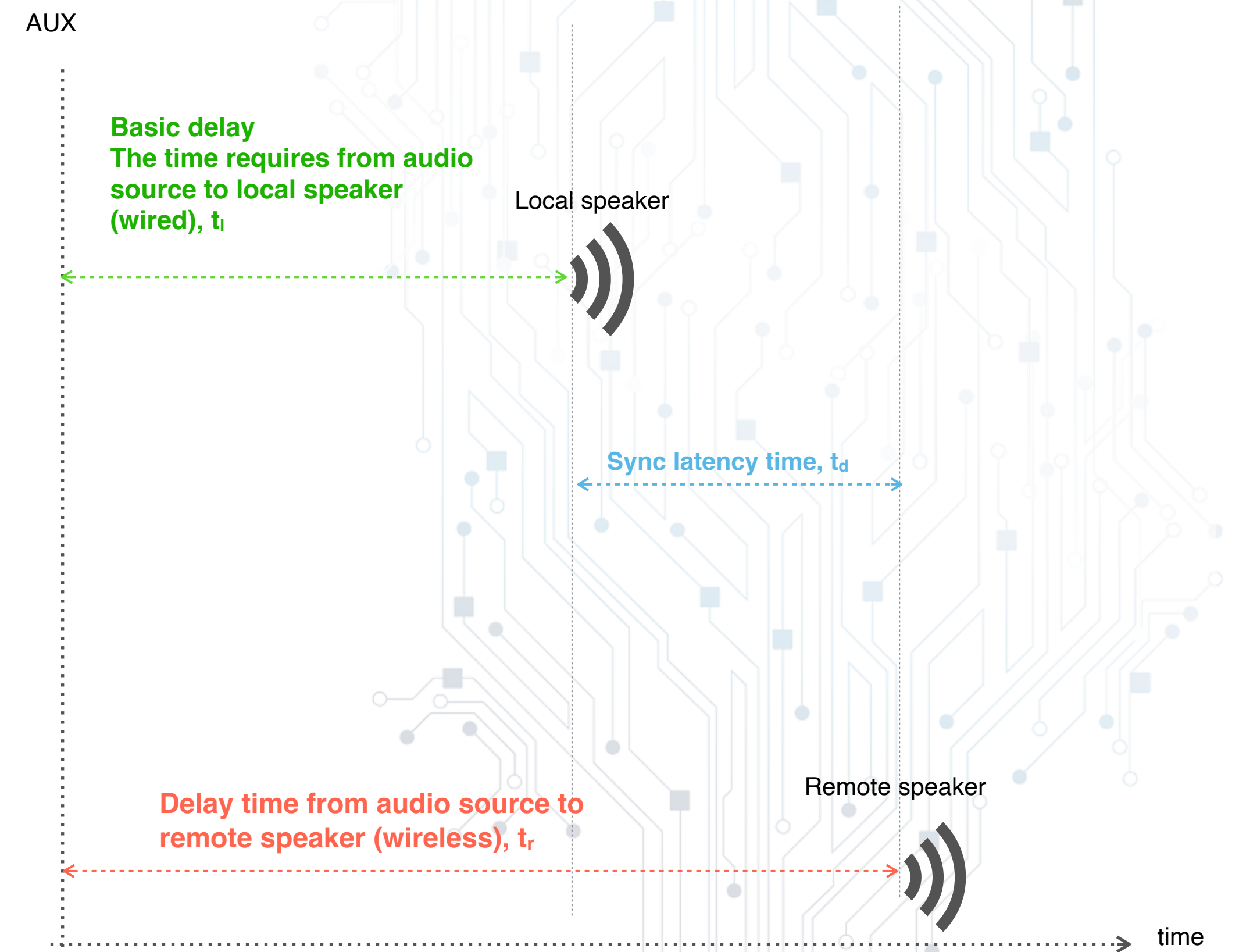
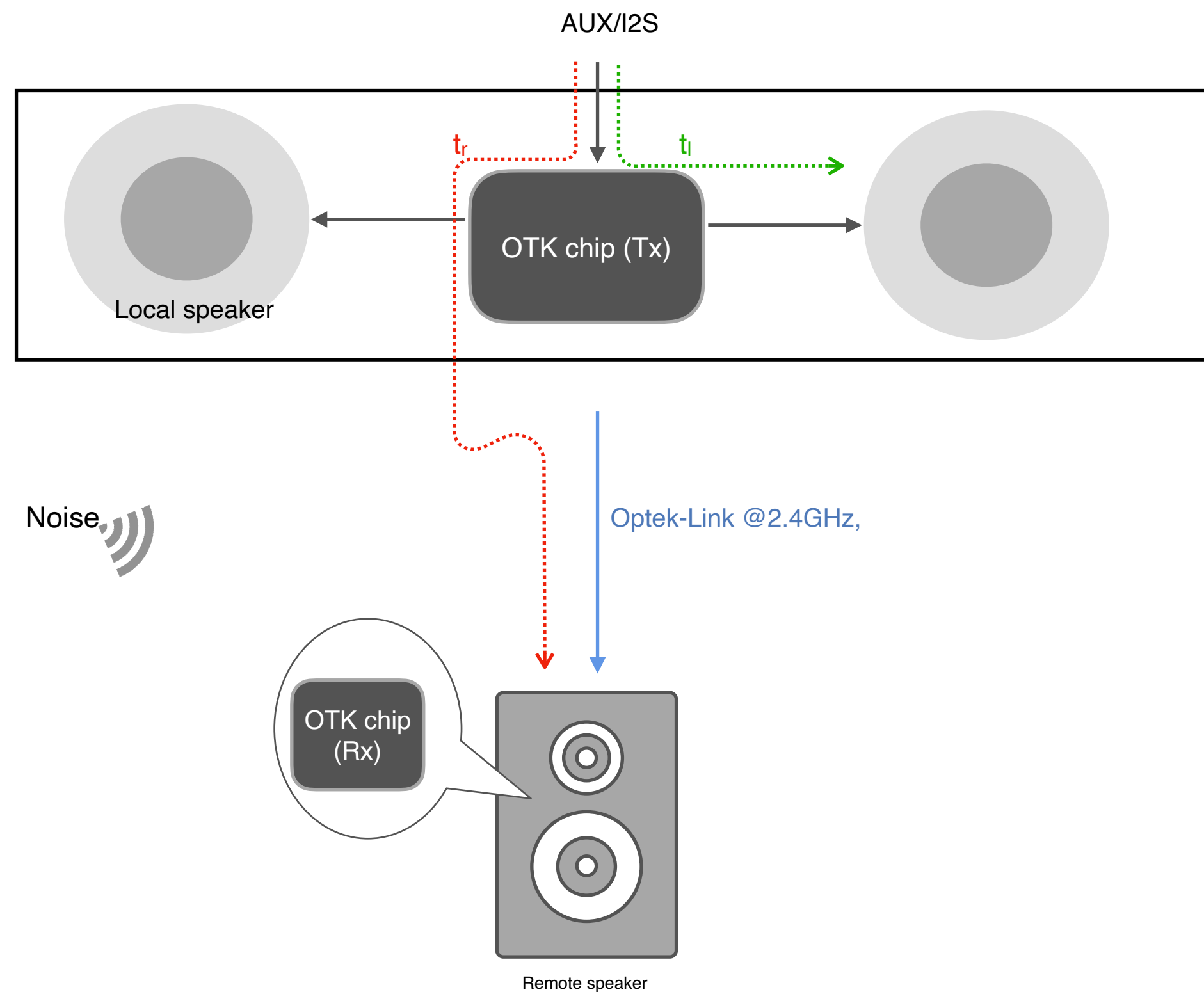
5 OptekLink™ dual band application

- OTK62xx embeds 2.4GHz transceiver, and it can also connect with a 5.8GHz chip/module as well



6 OptekLink™ latency test

- Latency testing setup, under noisy environment
 - 10 Bluetooth beacons
 - 4 WiFi devices



7 OptekLink™ latency test result

Source from AUX

Test	t_i (ms)	t_r (ms)	t_d (ms)
1	9.031	9.043	0.012
2	9.031	9.050	0.019
3	9.031	9.037	0.006
4	9.031	9.042	0.011
5	9.031	9.040	0.009
6	9.031	9.047	0.016
7	9.031	9.053	0.001
8	9.031	9.048	0.017
9	9.031	9.041	0.010
10	9.031	9.052	0.021
Latency range: 0.001ms to 0.021ms			

Source from I2S

Test	t_i (ms)	t_r (ms)	t_d (ms)
1	7.93	7.943	0.013
2	7.93	7.936	0.006
3	7.93	7.942	0.012
4	7.93	7.954	0.024
5	7.93	7.948	0.018
6	7.93	7.941	0.011
7	7.93	7.958	0.028
8	7.93	7.944	0.014
9	7.93	7.938	0.008
10	7.93	7.947	0.017
Latency range: 0.006ms to 0.028ms			

Conclusion:

- Latency to remote speaker down to 8ms or below
- Input source affect the latency time (as extra encoding/decoding is needed)
- OptekLink can sync the local and remote output, where the different is less than 0.1ms