

# Time-Critical Applications over Next-Generation 802.11 Networks

## New Applications & Requirements beyond High Throughput:



Industrial Automation



Autonomous Systems



Immersive VR & PRO Gaming

Emerging applications require more accurate time synchronization and predictable, low latency with higher reliability

## Legacy 802.11:

- ❖ Mostly Best-Effort traffic
- ❖ Prioritized access (e.g. AC\_VO, AC\_VI), but without worst case latency guarantees
- ❖ Interference/contention handled through Random Access (CSMA MAC)

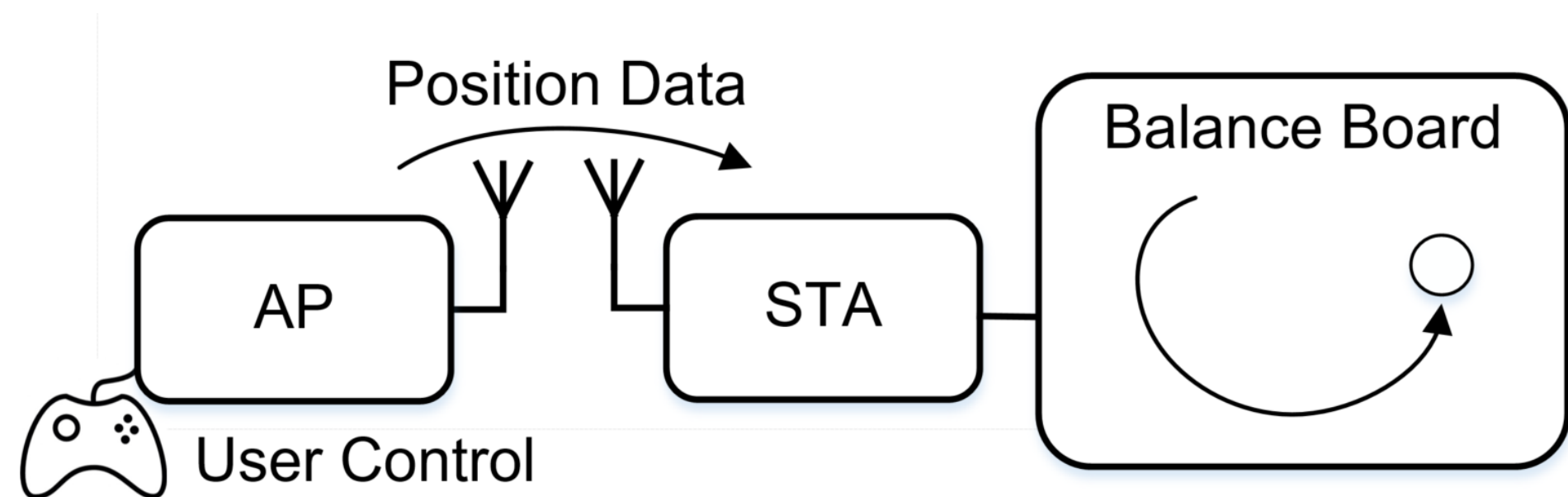
## Next Generation 802.11ax:

- ❖ Trigger-based (AP controlled) access
- ❖ Scheduled (TWT) service periods
- ❖ OFDMA

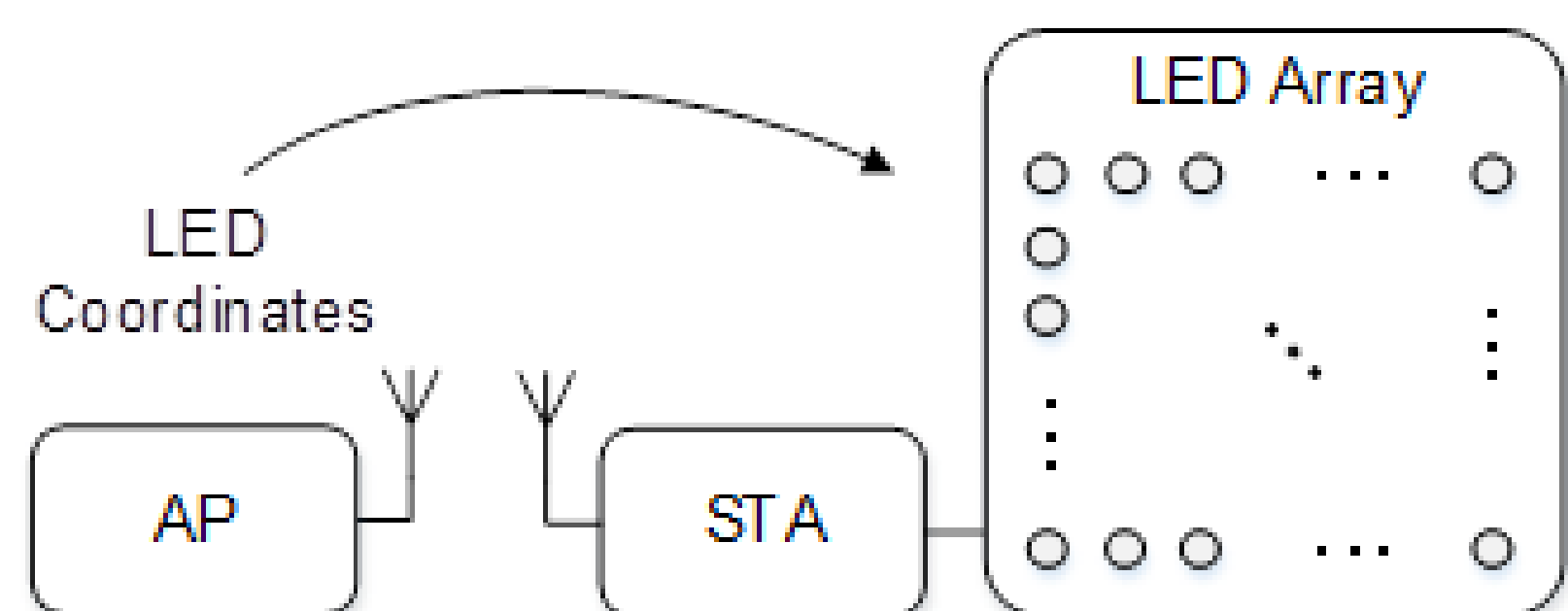
New capabilities enable better control of latency and reliability, especially in managed network deployments (e.g. Factory/Enterprise networks)

## Low Latency Wi-Fi Demos:

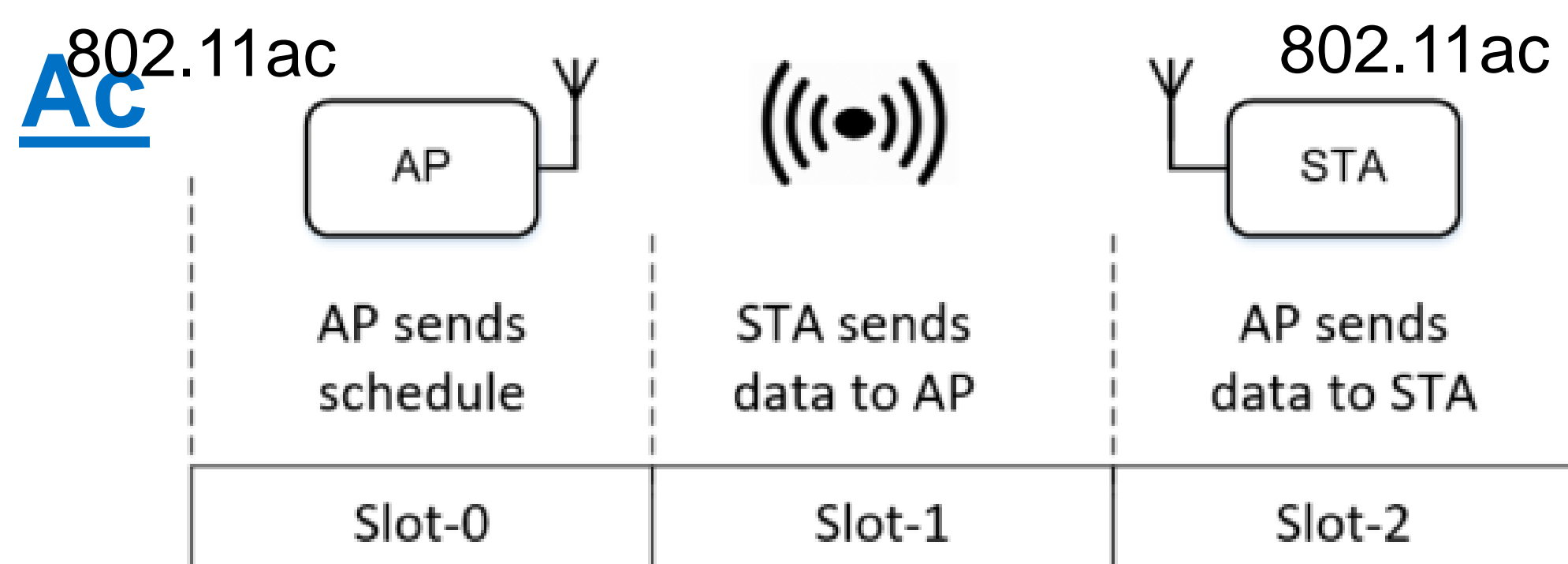
Time-Critical Control: Balancing Board



Synchronous Control: LED Array



## Time Synchronized Scheduled



## FPGA Radio Platform:



Experimental 802.11ax PHY (research)