Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Overview of a proposal for PAC operating in synchronous mode (ppt)]
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Re: [In response to call for proposals to TG8]

Abstract: [This document contains overview of a proposal for PAC operating in synchronous mode]

Purpose: [Materials for Proposal in 802.15.8 TG]

Contents

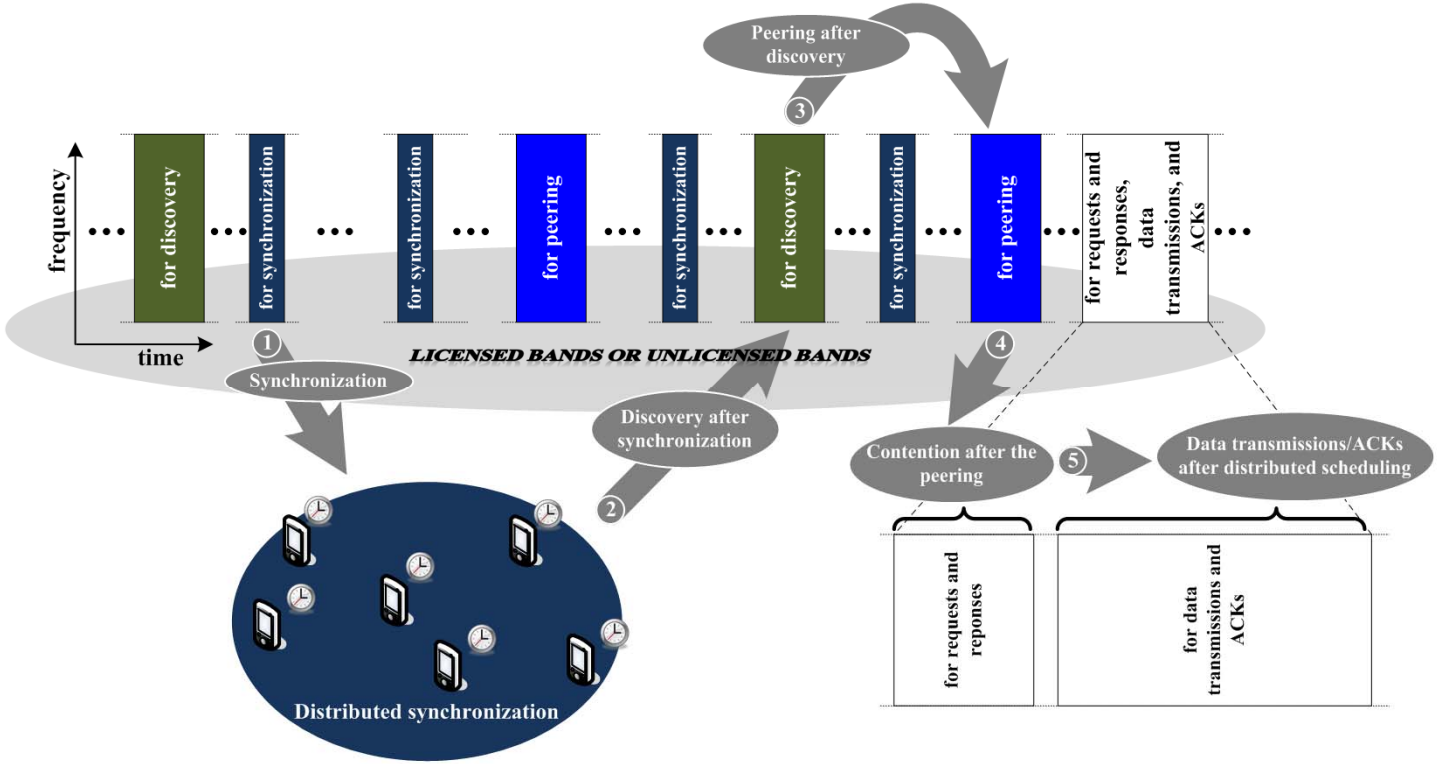
- Proposal outline
- Operation overview
- Key features of the proposal
- Conclusion

Proposal outline

- In May, we presented a preliminary example in licensed bands for PAC in synchronous mode.
  - The presentation(DCN: 15-13-0273-00-0008) covered both PHY and MAC for PAC in licensed bands operating in synchronous mode
- In July, we propose both PHY and MAC in unlicensed bands for PAC in synchronous mode.
  - DCN 15-13-0391-01-0008 or the latest version: Overview of proposal (This document)
  - DCN 15-13-0393-00-0008 or the latest version: PHY proposal (ppt)
  - DCN 15-13-0390-01-0008 or the latest version: MAC proposal (ppt)
  - DCN 15-13-0392-00-0008 or the latest version: Proposal details (doc)

Operation overview

- Synchronous mode operation for PAC in both licensed bands and unlicensed bands is proposed.
  - Radio resource is divided in time by its usage



Key features of the proposal

Operation in licensed band	Features	Operation in unlicensed band
▪ Support for the large number of PDs	The focal point of design	▪ Support for the large number of PDs
▪ Efficient bandwidth utilization in the licensed band	Design considerations	▪ Coexistence with heterogeneous devices - Heterogeneous interference sensing - Blocking signal - Low power transmission
▪ Sectionized and fixed frame format	Frame structure	▪ Sectionized and fixed frame format - Heterogeneous interference sensing - Blocking signal - Low power transmission
▪ Distributed synchronization	Synchronization	▪ Distributed synchronization - Heterogeneous interference sensing - Blocking signal - Low power transmission

Key features of the proposal

Operation in licensed band	Features	Operation in unlicensed band
▪ Support for both broadcast-based and request/response-based discovery	Discovery	▪ Broadcast-based discovery with support for request/response-based discovery, which is adapted to unlicensed bands ▪ Distributed allocation of discovery resource ▪ Shuffling and blocking of discovery signal for the operation in unlicensed bands - Heterogeneous interference sensing
▪ Sharing of an orthogonal PID(Peering ID) between peers after peering ▪ Random access for transmitting peering-request/response	Peering	▪ Sharing of an orthogonal PID(Peering ID) between peers after peering ▪ Random access for transmitting peering-request/response ▪ Shuffling and blocking of PID broadcasting signal for the operation in unlicensed bands - Heterogeneous interference sensing

Key features of the proposal (cont.)

Operation in licensed band	Features	Operation in unlicensed band
▪ *Frequency-domain* orthogonal signaling in an OFDMA manner	Signaling for multiple access	▪ *Time-domain* orthogonal signaling in an OFDM manner
▪ Priority-based fully distributed scheduling	Scheduling	▪ Priority-based fully distributed scheduling
▪ OFDMA & TDMA/OFDM	Multiple access scheme for data transmission	▪ TDMA/OFDM

- Even though following features are not covered in the current proposal, it will be not long before they are included in our proposal.
  - Power saving scheme
    - At least a couple of power saving modes should be supported in PAC.
  - Multicast

Adaptation to unlicensed bands

- Much consideration is given to coexistence mechanism
  - Wireless technology designed to operate in unlicensed band shall consider coexistence mechanism.
  - PAC will create a Coexistence Assurance document as part of the WG balloting process.

- The proposal for PAC in unlicensed bands includes:
  - Heterogeneous interference sensing
  - Blocking signal
  - Low power transmission

Conclusion

- We propose a synchronous mode of PAC in both licensed bands and unlicensed bands.
- In the previous meeting, we proposed a synchronous mode of PAC in licensed bands.
- In this meeting, we propose a synchronous mode of PAC in unlicensed bands which is basically an adapted version of the previous proposal.

Conclusion (cont.)

- The adaptation to unlicensed bands is featured with the coexistence mechanism with heterogeneous devices.
- It seems that PAC has much interest in unlicensed bands, especially in ISM bands.
- We take the coexistence with Wi-Fi stations in ISM band into our consideration.