SUMMARY

[6] Non-limiting examples facilitate providing communication apparatuses and communication methods for prioritized traffic, more particularly low latency traffic in context of EHT WLAN.

[7] In a first aspect, the present disclosure provides a communication apparatus comprising: a receiver, which, in operation, receives from another communication apparatus a beacon frame which notifies one or more restricted target wake time (R-TWT) service periods (SPs), each R-TWT SP being a time period in which transmission of frames belonging to a traffic type different from a traffic type designated by the other communication apparatus is restricted; and circuitry, which, in operation, determines if at least one latency sensitive frame is to be transmitted in one of the one or more R-TWT SPs, and refrains from transmitting during the one of the one or more R-TWT SPs in response to the determination that there are no latency sensitive frames to be transmitted; wherein the circuitry is further configured to generate to the other communication apparatus a first request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the first request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel; and wherein the receiver further receives from the other communication apparatus a first response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs; and wherein the circuitry is further configured to, in response to receiving the first response signal, determine that the communication apparatus is associated with the one of the one or more R-TWT SPs and set up with the set of parameters for transmissions during the one of the one or more R-TWT SPs.

[8] In a second aspect, the present disclosure provides a communication method performed by a communication apparatus comprising: receiving from another communication apparatus a beacon frame which notifies one or more restricted target wake time (R-TWT) service periods (SPs), each R-TWT SP being a time period in which transmission of frames belonging to a traffic type different from a traffic type designated by the other communication apparatus is restricted; determining if at least one latency sensitive frame is to be transmitted in one of the one or more R-TWT SPs;

refraining from transmitting during the one of the one of more R-TWT SPs in response to the determination that there are no latency sensitive frames to be transmitted; generating to the other communication apparatus a first request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the first request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel; receiving from the other communication apparatus a first response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs; and in response to receiving the first response signal: determining that the communication apparatus is associated with the one of the one or more R-TWT SPs; and setting up with set of parameters for transmissions during the one of the one or more R-TWT SPs.

[9] It should be noted that general or specific examples may be implemented as a system, a method, an integrated circuit, a computer program, a storage medium, or any selective combination thereof.

[10] Additional benefits and advantages of the disclosed examples will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various examples and features of the specification and drawings, which need not all be provided in order to obtain one or more of such benefits and/or advantages.

CLAIMS

1. A communication apparatus, comprising:

a receiver, which, in operation, receives from another communication apparatus a beacon frame which notifies one or more restricted target wake time (R-TWT) service periods (SPs), each R-TWT SP being a time period in which transmission of frames belonging to a traffic type different from a traffic type designated by the other communication apparatus is restricted; and

circuitry, which, in operation, determines if at least one latency sensitive frame is to be transmitted in one of the one or more R-TWT SPs, and refrains from transmitting during the one of the one or more R-TWT SPs in response to the determination that there are no latency sensitive frames to be transmitted;

wherein the circuitry is further configured to generate to the other communication apparatus a first request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the first request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel; and wherein the receiver further receives from the other communication apparatus a first response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs; and wherein the circuitry is further configured to, in response to receiving the first response signal, determine that the communication apparatus is associated with the one of the one or more R-TWT SPs and set up with the set of parameters for transmissions during the one of the one or more R-TWT SPs.

2. The communication apparatus of claim 1, wherein the receiver further receives from the other communication apparatus a second request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the second request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel; and wherein the circuitry is further configured to, in response to receiving the second request signal, generate to the other communication apparatus a second response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs, determine that the communication apparatus is associated with the one of the one or more R-TWT SPs and set up with the set of parameters for transmission during the one of the one or more R-TWT SPs.

3. The communication apparatus of claim 1, wherein the circuitry is further configured to:

generate a third request signal to the other communication apparatus, the third request signal comprising a request to initiate the transmissions during the one of the one or more R-TWT SPs; and wherein the receiver further receives a third response signal from the other communication apparatus, the response signal indicating that the communication apparatus is allowed to initiate the transmissions during the one of the one or more R-TWT SPs.

4. The communication apparatus of claim 1 or 2, wherein the receiver further receives, during the one of the one or more R-TWT SPs, a legacy frame carrying a network allocation vector (NAV) exclusion field; and wherein the circuitry is further configured to, in response to determining that the communication apparatus is associated with the one of the one or more R-TWT SPs, refrain from setting the NAV of the communication apparatus, regardless of whether the legacy frame is addressed to the communication apparatus or not.

5. The communication apparatus of claim 4, wherein the legacy frame is a Request To Send (RTS) frame carrying a first NAV exclusion field with a NAV exclusion field value and addressed to the communication apparatus; and wherein the circuitry is further configured to generate a Clear To Send (CTS) frame carrying a second NAV exclusion field set to the NAV exclusion field value.

6. The communication apparatus of claim 1, wherein the receiver receives from the other communication apparatus a normal OFDMA (orthogonal frequency division multiple access) Contention Window (OCW) range for a normal Uplink OFDMA-based Random Access (UORA) and a prioritized OCW range; wherein the circuitry is configured to compute parameters of a prioritized UORA based on the received prioritized OCW range; and wherein the receiver further receives one or more Trigger frames, each of the one or more Trigger frames allocating one or more Random Access Resource Units (RA-RUs) and specifying the designated traffic type that are allowed to be transmitted in a response frame.

7. A communication method performed by a communication apparatus, comprising:

receiving from another communication apparatus a beacon frame which notifies one or more restricted target wake time (R-TWT) service periods (SPs), each

R-TWT SP being a time period in which transmission of frames belonging to a traffic type different from a traffic type designated by the other communication apparatus is restricted;

determining if at least one latency sensitive frame is to be transmitted in one of the one or more R-TWT SPs;

refraining from transmitting during the one of the one of more R-TWT SPs in response to the determination that there are no latency sensitive frames to be transmitted;

generating to the other communication apparatus a first request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the first request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel;

receiving from the other communication apparatus a first response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs; and

in response to receiving the first response signal:

determining that the communication apparatus is associated with the one of the one or more R-TWT SPs; and

setting up with set of parameters for transmissions during the one of the one or more R-TWT SPs.

8. The communication method of claim 7, further comprising:

receiving from the other communication apparatus a second request signal specifying a set of parameters for the one of the one or more R-TWT SPs, the second request signal including at least one of a wake up time, a minimum wake up duration, a wake interval and a channel; and

in response to receiving the second request signal:

generating to the other communication apparatus a second response signal indicating an acceptance of the set of parameters specified for the one of the one or more R-TWT SPs;

determining that the communication apparatus is associated with the one of the one or more R-TWT SPs; and

setting up with the set of parameters for transmission during the one of the one or more R-TWT SPs.

9. The communication method of claim 7, further comprising:

generating a third request signal to the other communication apparatus, the third request signal comprising a request to initiate the transmissions during the one of the one or more R-TWT SPs; and

receiving a third response signal from the other communication apparatus, the third response signal indicating that the communication apparatus is allowed to initiate the transmissions during the one of the one or more R-TWT SPs.