Medium Access Control

Service

MAC (javadoc/org/arl/unet/Services.html#MAC) – Medium access control service

Agents offering the *MAC* service provide some implementation of a medium access control protocol. They support a set of messages and parameters that are explained below. *MAC* service providers may also provide optional capabilities in the form of reliability through acknowledgement messages.

Capability	Description
RELIABILITY (javadoc/org/arl/unet/mac/MacCapability.html#RELIABILITY)	Reliability supported (usually via acknowledgement messages)
PRIORITY (javadoc/org/arl/unet/mac/MacCapability.html#PRIORITY)	Honors priority settings in reservation request
TTL (javadoc/org/arl/unet/mac/MacCapability.html#TTL)	Honors time-to-live settings in reservation request
TIMED_RESERVATION (javadoc/org/arl/unet/mac/MacCapability.html#TIMED_RESERVATION)	Scheduling of reservations in the future supported

Implementations

- AlohaACS (javadoc/org/arl/unet/mac/aloha/AlohaACS.html) – Aloha with adaptive carrier sensing
- MACA (javadoc/org/arl/unet/mac/maca/Maca.html) – MACA with early-ACK and multi-ACK extensions

Requests and Responses

Request	Possible Responses	Description
ReservationReq (javadoc/org/arl/unet/mac/ReservationReq.html)	ReservationRsp (javadoc/org/arl/unet/mac/ReservationRsp.html), REFUSE	Reserve the channel for a specified duration
ReservationCancelReq (javadoc/org/arl/unet/mac/ReservationCancelReq.html)	AGREE, REFUSE	Cancel a pending reservation request
ReservationAcceptReq (javadoc/org/arl/unet/mac/ReservationAcceptReq.html)	AGREE, REFUSE	Piggyback payload in a reservation PDU
TxAckReq (javadoc/org/arl/unet/mac/TxAckReq.html)	AGREE, REFUSE	Transmit acknowledgement payload
ParameterReq (javadoc/org/arl/unet/ParameterReq.html)	ParameterRsp (javadoc/org/arl/unet/ParameterRsp.html)	Get/set/list parameters
CapabilityReq (javadoc/org/arl/unet/CapabilityReq.html)	CONFIRM, DISCONFIRM, CapabilityListRsp (javadoc/org/arl/unet/CapabilityListRsp.html)	Check/list capabilities

MAC protocols that use PDUs for channel reservation may support piggybacking of client data in the PDU. If such support is available, it is advertised using a non-zero reservationPayloadSize (javadoc/org/arl/unet/mac/MacParam.html#reservationPayloadSize) parameter. A ReservationReq (javadoc/org/arl/unet/mac/ReservationReq.html) should provide the payload data to be sent to a peer node (as part of RTS or

equivalent PDU) to whom the reservation is made. If that node wishes to send payload data back (as part of CTS or equivalent PDU), it may send a ReservationAcceptReq (javadoc/org/arl/unet/mac/ReservationAcceptReq.html) in response to a ReservationStatusNtf (javadoc/org/arl/unet/mac/ReservationStatusNtf.html) to provide its payload data.

For MAC implementations that support RELIABILITY (javadoc/org/arl/unet/mac/MacCapability.html#RELIABILITY), the agent must support the TxAckReq (javadoc/org/arl/unet/mac/TxAckReq.html) request to provide acknowledgement payload to be transmitted to the peer node at the end of the reservation. On reception, this would generate a RxAckNtf (javadoc/org/arl/unet/mac/RxAckNtf.html) on the peer node.

Notifications

Notification	Topic	Description
ReservationStatusNtf (javadoc/org/arl/unet/mac/ReservationStatusNtf.html)	default	Current status of reservation request
RxAckNtf (javadoc/org/arl/unet/mac/RxAckNtf.html)	default	Acknowledgement payload notification
ParamChangeNtf (javadoc/org/arl/unet/ParamChangeNtf.html)	PARAMCHANGE (javadoc/org/arl/unet/Topics.html#PARAMCHANGE)	Notification about the modified parameter

Parameters

Parameter	r/w	Description
channelBusy (javadoc/org/arl/unet/mac/MacParam.html#channelBusy)	ro	True if channel is busy, false otherwise
reservationPayloadSize (javadoc/org/arl/unet/mac/MacParam.html#reservationPayloadSize)	ro	Maximum size of payload (bytes), which can be piggybacked in a reservation PDU
ackPayloadSize (javadoc/org/arl/unet/mac/MacParam.html#ackPayloadSize)	ro	Maximum size of acknowledgement (bytes), which can be included in an ACK PDU
maxReservationDuration (javadoc/org/arl/unet/mac/MacParam.html#maxReservationDuration)	ro	Maximum duration of reservation in seconds
recommendedReservationDuration (javadoc/org/arl/unet/mac/MacParam.html#recommendedReservationDuration)	ro	Recommended duration of reservation in seconds (null, if unspecified)

Last updated on Oct 20, 2018.

Back to top