IEEE P802.11
Wireless Access Method and Physical Layer Specifications

Title: MAC / PHY / Management Service Interfaces

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Abstract

This paper proposed an *initial* overview of the layer-to-layer communication which could be used to specify the logical service interfaces to be addressed in the IEEE 802.11 Standard. The following service interfaces have been identified:

- Higher Layers / MAC Service Interface
- MAC / PHY Service Interface
- MAC / Management Service Interface
- PHY / Management Service Interface

The contribution describes the above mentioned service interfaces in terms of service primitives that are exchanged between adjacent layers.

General

Communications between layers are accomplished by means of service primitives which are passed across the layer boundaries.

The service primitives represent, in an abstract way, the logical exchange of information and control between adjacent layers. They do not specify nor constrain implementations.

The general syntax of a primitive is:

- Service-interface - Generic - Type:(Parameters)

Note that only 'Service-interface', a *preliminary* set of 'Generic-names', and 'Types' are proposed here. A complete set of 'Generic-names' and 'Parameters' remain to be defined. It is not required that all primitives have associated parameters.

Service-interface

This primitive element designates the service interface across which the primitive flows.

MAC - for communication between the higher layers and the MAC layer

PH - for communication between the MAC layer and the physical layer

MMAC - for communication between the management entity and the MAC layer

MPH - for communication between the management entity and the physical layer

Generic-name

The 'Generic-name' specify the activity that should be performed. The primitives defined below which show services interface and associated Generic-name, may or may not have associated parameters (not defined here).

MAC_ACTIVATE_SAP (Service Access Point) - These primitives are used to request and indicate the outcome of the procedures for establishing a service access point to a MAC layer entity.

MAC-DEACTIVATE_SAP - These primitives are used to request and indicate the outcome procedures for terminating the previously activated service access point or for reporting an unsuccessful activation attempt.

MAC_UNIT_DATA - These primitives are used to request and indicate higher layer messages which are to be transmitted, or have been received, by the MAC layer.

MMAC_EVENT - This primitive is used by the MAC layer to indicate to the management entity unsolicited MAC events. The type of events may include counter reaching a given threshold, MAC error, etc.

MMAC_GET - The primitive is used by the management layer to request information from the MAC layer such as current event counter contents. This primitive is also used by the MAC layer to confirm the completion of the requested task.

MMAC_SET - This primitive is used by the management layer to request the modification of MAC layer attribute values such as counter threshold, configuration parameters, etc.. The primitive is also used by the MAC layer to confirm the completion of the requested task.

PH_ACTIVATE - These primitives are used to request activation of the PHY layer connection or to indicate that the PHY layer connection has been activated.

PH_DEACTIVATE - These primitives are used to request deactivation of the PHY layer connection or to indicate that the PHY layer connection has been deactivated.

PH_DATA - These primitives are used to request and indicate messages units containing information for the MAC layer peer-to-peer communications passed to and from the PHY layer.

MPH_EVENT - This primitive is used by the PHY layer to indicate to the management layer unsolicited PHY events.
The type of events may include counter reaching a given threshold, PHY error, etc..

MPH_GET - The primitive is used by the management layer to request information from the PHY layer such as current event counter contents. This primitive is also used by the PHY layer to confirm the completion of the requested task.

MPH_SET - This primitive is used by the management layer to request the modification of PHY layer attribute values such as counter threshold, configuration parameters, etc.. The primitive is also used by the PHY layer to confirm the completion of the requested task.

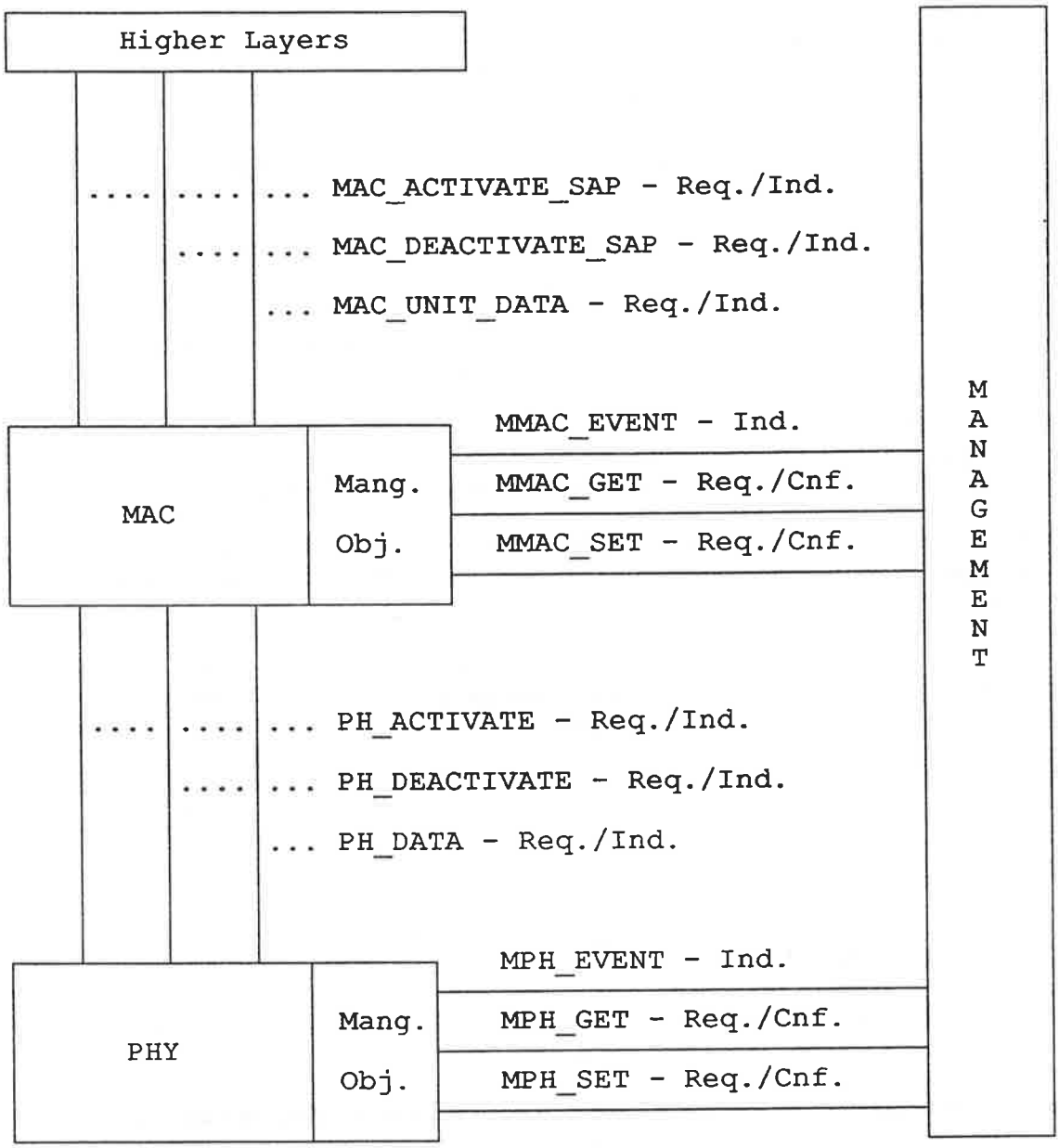
Type

The primitive types defined in this proposal are listed below.

REQUEST (Req.) - The Request primitive type is used when a higher layer or management layer is requesting a service from the lower layer (n-1 layer).

INDICATION (Ind.) - The Indication primitive type is used when a layer providing a service to inform the higher layer (n+1 layer) or management layer.

CONFIRM (Cnf.) - The Confirm primitive type is used by the layer providing the requested service to confirm that the requested activity has been completed.



Notes: MAC_ : Higher layers / MAC service interface
MMAC_ : MAC / Management service interface
PH_ : MAC / Physical service interface
MPH_: PHY / Management service interface

Layer-to-Layer Service Interfaces Model

Conclusion

This submission was motivated by the need of a common 'language' when defining the MAC / PHY / Management service interfaces. While the proposed elements for layer-to-layer communication may be incomplete, it is proposed that a model of the logical service interfaces based on this contribution be introduced in the 802.11 'Interface Specifications' section (see P802.11 - 92/56 - Proposal for a Structure 802.11 Document Plan) of the draft standard.

References

[1] ISO/IEC 9595 - Information technology - Open Systems Interconnection - Common Management Information Service Definition for CCITT Applications

[2] CCITT Q.921 Recommendation (1988) - ISDN User-network Interface - Data Link Layer Specification