# MAC/PHY Interface Specifics In Support
## of the Use of a Parameter Service Access Point
## Approach to PHY Independence

Submitted By:
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Main Issues Addressed:
12.1 What is the MAC\PHY Interface
12.4 Is layer providing PHY independence MAC/PHY (sic.)
12.8 Is PHY independence need to be specified in MAC (sic.)
13.4 MAC/PHY exchange to supply network management info
Others 13.5,13.7,13.8,16.6

## ▣ Overview

In previous meetings we have been elaborating on the use of a Local Management Entity in the MAC to support PHY independence and provide the flexibility for both MACs and PHYs to evolve as technology becomes available to solve networking, propagation, and power consumption challenges. The framework outlined in this document is intended to illustrate the methodology through which this can be achieved. Basically, there are two Service Access Points between the MAC and PHY. These are the **Data Service Access Point (DSAP)** and the **Parameter Service Access Point (PSAP)**. The DSAP supports the transmission of normal data packets called **MAC Protocol Data Units (MPDU)** and the PSAP supports interactions between the MAC and PHY that can happen on a frame by frame basis in order to improve the ability of stations to access the medium. The approach described includes a **Parameter Mapping Function (PMF)** that is provided by the PHY to the MAC (and possibly updated by the MAC) that provides the information needed to improve media access effectiveness. Other items that are included in the framework are **Remote Control Parameter Vectors (RCPV)** and **Local Control Parameter Vectors (LCPV)**. These provide information to peer MACs regarding how the source and destination PHYs transmit and receive a message. The $RCPV_T$ is information included in a header of the MPDU that tells the receiving station (destination station) how the transmitting station's (source station) PHY was set when the message was transmitted. The $RCPV_R$ is the information decoded by the receiving MAC from the header of a received MPDU that reflects the transmitted $RCPV_T$. The $LCPV_R$ is information reported to the local MAC by the local PHY to tell the local MAC how it received the packet. The $LCPV_T$ is information provided by the MAC to its local PHY to tell the PHY how to set up for this transmission. LCPVs are exchanged through the PSAP while RCPVs are present in the MPDU and are generated and decoded by MAC Entities. Finally, each MAC maintains a **Table of Control Parameters (TCP)** that contains RCPvs and LCPVs associated with the stations in its environment that it is aware of.

## ▣ Sequence of Operation

The diagram attached illustrates the flow of information. When a station desires to transmit its MAC checks its Table of Control Parameters for the destination station and determines how it should set up its PHY to achieve communications. The settings it needs to use are a result of executing the Parameter Mapping Function on the $RCPV_R$ and the $LCPV_R$ found in the TCP for the given destination station. The results of the PMF

**Table of Control Parameters**
This Table is kept by the MAC of Station #1
Includes Remote Control Parameters Received
from Station #2 and the Local Control Parameters
the PHY of this Station #1 used for receiving from
Station #2

| Address | RCP 1 | RCP N | LCP 1 | LCP N |
|---------|-------|-------|-------|-------|
| 2 | xx | xx | yy | yy |

**Table of Control Parameters**
This Table is kept by the MAC of Station #2
Includes Remote Control Parameters Received
from Station #1 and the Local Control Parameters
the PHY of this Station #2 used for receiving from
Station #1

| Address | RCP 1 | RCP N | LCP 1 | LCP N |
|---------|-------|-------|-------|-------|
| 1 | zz | zz | aa | aa |

**Station #1**

**Station #2**
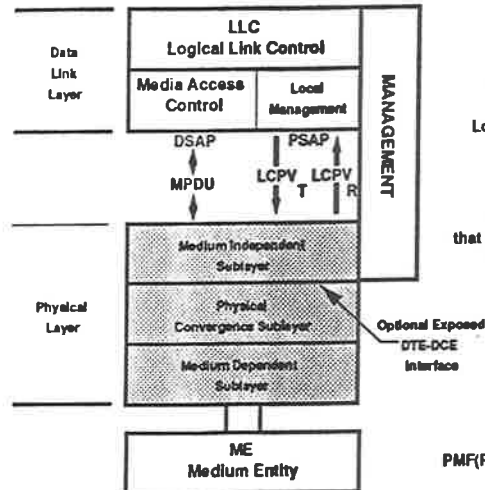
Data Service Access Point (DSAP)
is the service access point
through which receive MPDU's
and transmit MPDUs pass

Parameter Service Access Point (PSAP)
is the service access point
through which the Local Control Parameters
required by the PHY to transmit and
Local Control Parameters calculated by the PHY
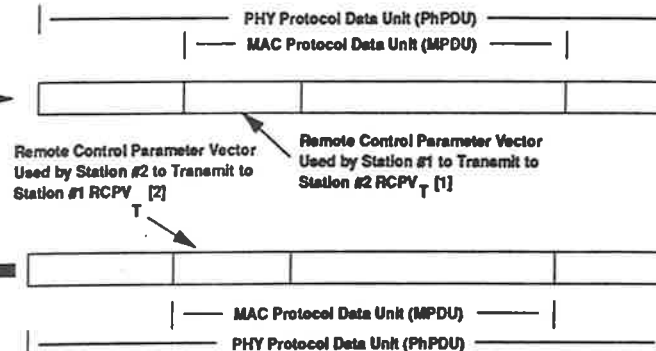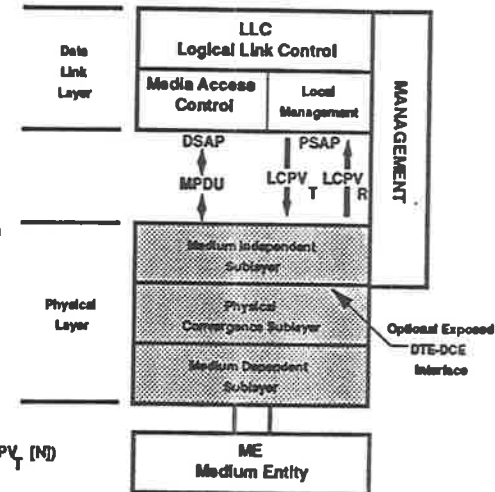on receive pass

Parameter Mapping Function (PMF)
is a function provided by the PHY to the MAC
that provides a mapping between receive RCPV and a
receive LCPV to the transmit LCPV and RCPV

LLC
Logical Link Control

Media Access Control | Local Management

MANAGEMENT

Data Link Layer

DSAP
MPDU
PSAP
$LCPV_T$  $LCPV_R$

Medium Independent Sublayer

Physical Layer

Physical Convergence Sublayer

Optional Exposed DTE-DCE Interface

Medium Dependent Sublayer

ME
Medium Entity

$PMF(RCPV_R[N], LCPV_R[N])$ provides $(RCPV_T[N], LCPV_T[N])$

PHY Protocol Data Unit (PhPDU)

MAC Protocol Data Unit (MPDU)

Remote Control Parameter Vector
Used by Station #2 to Transmit to
Station #1 $RCPV_T[2]$

Remote Control Parameter Vector
Used by Station #1 to Transmit to
Station #2 $RCPV_T[1]$

MAC Protocol Data Unit (MPDU)

PHY Protocol Data Unit (PhPDU)