

DTBS Standard Specification Details

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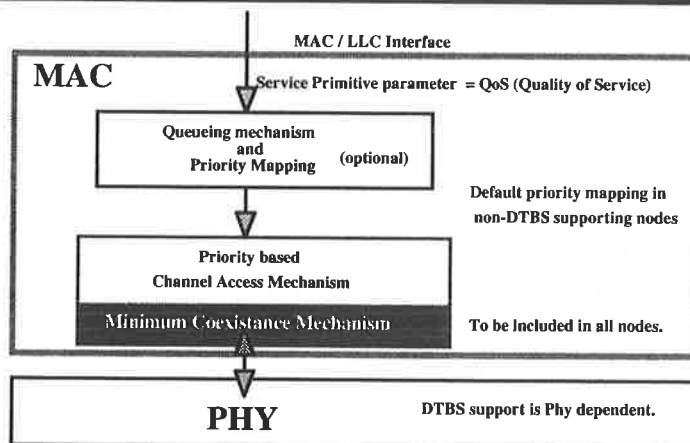
Assumptions:

- **DTBS Service support is optional.**
 - But all stations need to provide “DTBS-Coexistence” provisions.
- **Not all Phy’s need to specify DTBS capability support.**
- **A Single State Machine in the MAC can support multiple mechanisms:**
 - A passive access priority mechanism
 - An active access priority mechanism
 - No operational access priority mechanism
- **A given PHY standard shall specify only one access priority mechanism.**

DTBS Support levels:

- **The DTBS service is optional.**
 - But coexistence mechanisms need to be implemented in every node to assure proper operation in the presence of stations that do implement the service.
- **DTBS support levels can be classified in two different levels:**
 - The DTBS coexistence mechanisms
 - » This is the access priority mechanism. A part of this needs to be included in all stations to assure coexistence with the DTBS service, even when it is not implemented.
 - The DTBS Service interface and priority mapping
 - » This is the definition of the LLC interface, and its control by means of the QoS parameter, and the translation of this to the priority levels.
 - » In non-DTBS capable stations a fixed priority mapping is to be assigned.

DTBS implementation options:

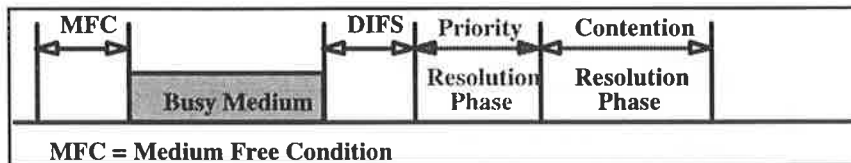


- **Only minimum coexistence mechanism is to be included in all implementations.**

Coverage of this proposal:

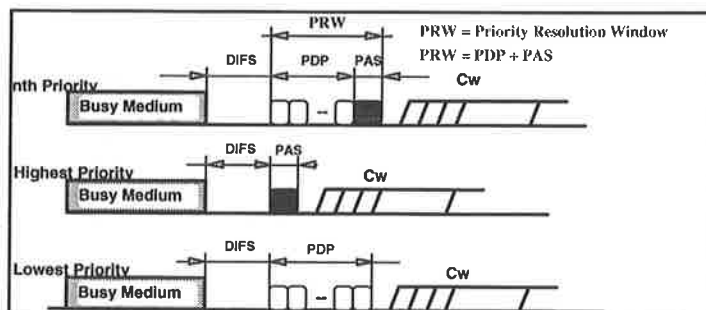
- **This proposal will only cover the “Access Priority “ mechanism.**
 - Describes a MAC State Machine to support the full Access Priority mechanism.
 - Identifies the minimum coexistence provisions needed.
 - Defines the MIB attributes needed.
- **Discusses AP versus Station relative priority characteristics.**
- **Other DTBS support specifications in particular the LLC interface and Service specifications are documented in doc 94/196, but are not covered by this proposal.**

DTBS Generic priority mechanism:



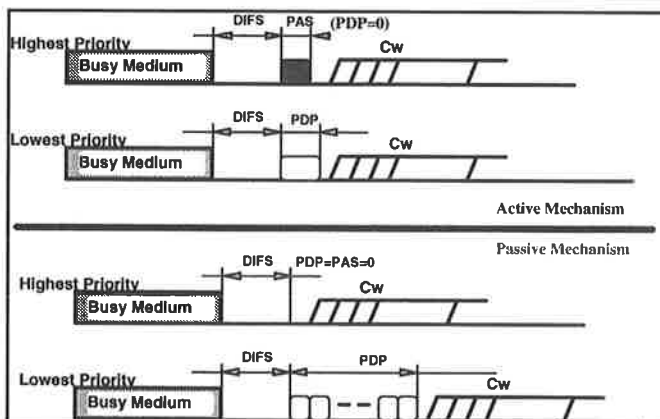
- **Extend contention resolution phase with a “Priority resolution Phase”.**
- **If “Medium Free Condition” is met at initial access attempt, then transmission can start immediately without any priority or contention resolution.**
 - The MFC can be priority level dependent.

Generic Priority resolution mechanism:



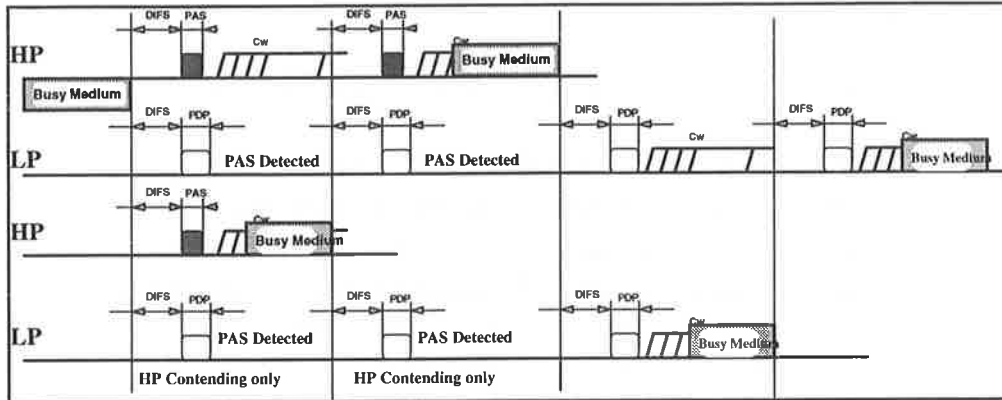
- Mechanism can support both active and passive priority resolution method.
- Basic (coexistence) Algorithm:
 - If “Busy Medium” is detected during PDP period, then defer until the next Priority Resolution Window (PRW).

Single State Machine support both mechanisms:



- Specified by the PDP and PAS parameters.
 - A set of parameters are needed per priority.

Active Priority example:



- Ack is not shown in example.
- LP traffic does not contend with HP traffic.

Priority_Set examples:

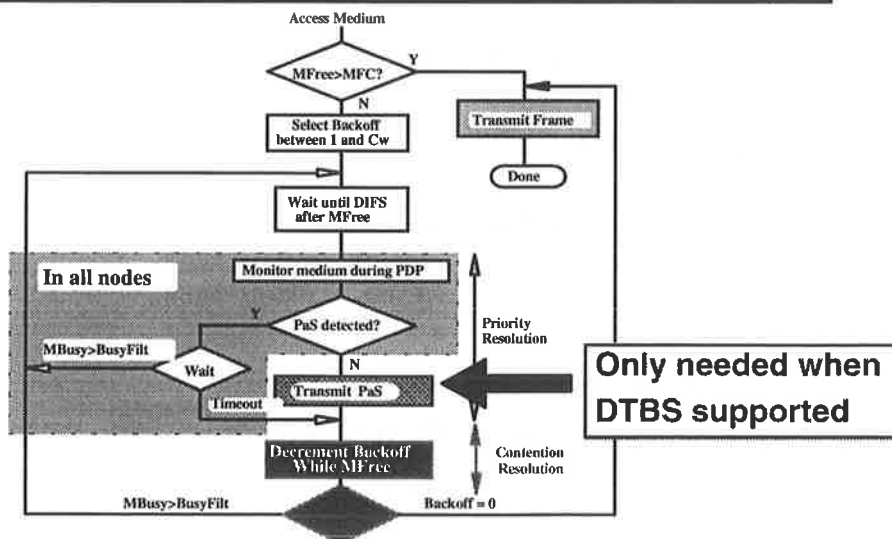
- "Active priority set" example for a 2 priority system:
 - Low priority: PDP = 2 slots, PAS = 0 slots.
 - High priority: PDP = 0 slots, PAS = 2 slots.
- "Passive priority set" example for a 2 priority system:
 - Low priority: PDP = 16 slots, PAS = 0 slots.
 - High priority: PDP = 0 slots, PAS = 0 slots.
- Assume $MFC = DIFS + PDP + PAS$.
- In a non-DTBS supporting station the default Access Priority setting should be: *Low Priority*.

MIB variables:

- **aNumber_of_Priorities:**
 - This indicates the number of different priority levels supported by the Phy. A “1” indicates that no priority mechanism is supported.
- **aPAS_Duration:** Determines the duration of the PAS.
- **Per priority the following parameter sets are required:**
 - **aPDP_x:** Specifies the PDP duration in usec for priority x.
 - **aPAS_x:** Specifies the PAS duration in usec for priority x.

Where x indicates the priority level (1 is highest).
- **Other MIB variables:**
 - **aBusyFilt:** Specifies the “Busy medium” condition under which the Backoff algorithm will be exit, to defer until the next PRW.
- **MFC can be derived per priority level.**

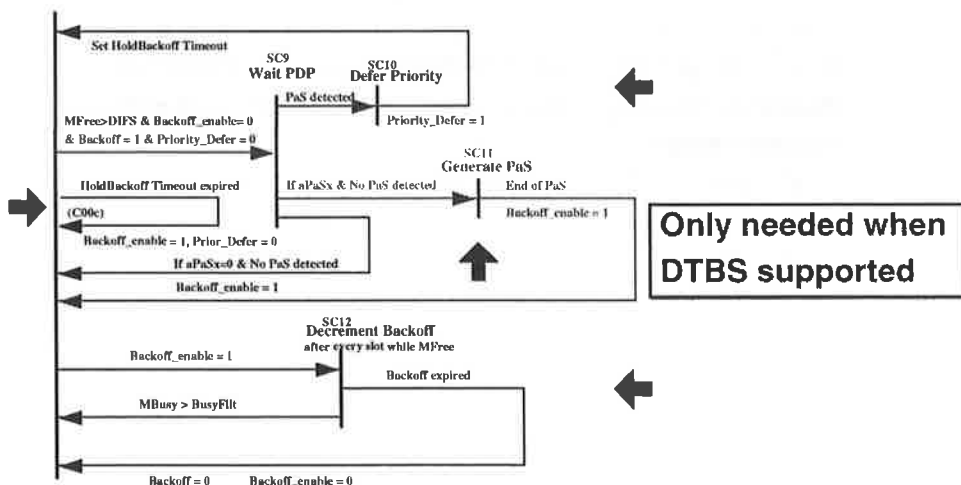
Basic Transmitter State Machine:



Requirements on the Phy:

- A new Class definition is needed to allow a Phy independent PAS signal generation.
 - Ph-DATA.request(SEND_PAS, param)
 - The parameters can be the same as for the START_OF_ACTIVITY class.
- The Phy can choose to use the same modulation as used in the PLCP header, with the length determined by the aPAS_Duration MIB variable.
 - Other modulation suitable for detection by the CCA detection mechanism can be specified.
- The !CCA detection mechanism should be suitable to signal the detection of a PAS signal modulation.

Draft standard updates needed:



Howmany priorities needed:

- **MAC service maps to:**
 - Queueing priority
 - Access Priority
- **At least two hierarchical independent priority levels needed to support the main services:**
 - Asynchronous service Low priority
 - Distributed TBS (optional) High priority
- **Quality of Service (QoS) should map to priority and Queuing priority.**

Additional Priority specification:

- **Additional relative priorities possible within a service level using Contention Window size differences.**
- **Relative Priority difference between AP and station makes sense.**
 - Most traffic will be via the AP.
 - So AP would generate close to 50% of frames.
 - Use of separate hierarchical independent levels for AP is not optimum.
 - » So in a Multi-priority environment, the AP should not be given a seperate level.
- **Higher relative Priority settings should only be allowed for an AP.**
 - Suggest $AP_CWmin = STA_CWmin / 2$

DTBS status

- **Priority mechanism presented to the combined MAC/PHY meeting on Tuesday**
 - This mechanism was accepted in the MAC group in the September meeting (with a slight modification).
 - The 20B3 draft changes have been distributed.
- **This MAC will not only need to support the current Phy's.**
 - but also the future Phy's.
 - and possibly higher speed extensions of the current Phy's.
- **Therefore this mechanism can serve different Phy's:**
 - Phy's that do not support a priority mechanism.
 - Phy's that can support a passive priority mechanism.
 - Phy's that can support an active priority mechanism.

Motion-1:

- **Move:**
That not all Phy standards need to support the coexistence mechanism for the optional DTBS service provisions. 7/37/15 fails

to add: Each phy will specify if it supports this or not as part of its standard Dave/Leon 8/37/17

Motion-2

- **Move:**
- **That the MAC should implement the Access priority mechanism as described in this proposal as documented in document 94_258x. 7/35/18.**