IEEE P802.11
Wireless LANs

|  |
| --- |
| QoS Simplification |
| Date: 2013-09-17 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Adrian Stephens | Intel Corp. | Pipers Way, Swindon SN3 1RJ | +44 (1793) 404 825 | adrian.p.stephens@intel.com |

Abstract

The purpose of this proposal is to allow for a simplified implementation of the 802.11 quality-of-service (QoS) facility. Specifically, this submission proposes (i) adding a bit to an existing “capabilities” field that indicates whether the 802.11 device implements a simplified QoS mechanism known as “QoS Simplification”; and (ii) specify that the mappings in Table 9-1 are not used and that all data packets are sent with a TID subfield value of 0 and a designation of “Best Effort” when QoS Simplification is implemented.

These changes will simplify the standard. Many applications have not found it necessary to variably prioritize traffic using the different access categories of the EDCA channel access mechanism—most traffic continues to be sent on a best effort basis with a TID subfield value of 0. Thus, it would be advantageous to allow for implementations that do not use EDCA, but maintain all other QoS functionality.

Additionally, a patent holder has asked for licenses from those implementing the standard, based on the capabilities expressed in Table 9-1, regardless of how it is actually being used. Those licenses increase the costs of implementing the standard. Accepting this proposal, therefore, would lower costs by creating an optionality that will enable implementers not to use the mapping in Table 9-1 and thus avoid paying for licenses that have been requested. Those costs are particularly unnecessary given that most traffic continues to be sent on a best effort basis with a TID subfield value of 0, and thus does not take advantage of the mapping capabilities in Table 9-1.

Finally, this proposal only adds an optional feature to the standard—it does not remove any specific technology from the standard. Implementers would thus remain free to use the mappings in Table 9-1 if they so desired.

R1: definition of MIB variable added.

**5.1.1.4 Interpretation of priority parameter in MAC service primitives**

***Insert the following sentence at the end of the third paragraph:***

When dot11QoSSimplificationImplemented is true, UP values 0 to 7 are mapped to TID subfield value 0 for outgoing MSDUs.

**8.2.4.5.1 QoS Control field structure**

***Change Table 8-5 as follows (only NOTE and its reference is added):***

**Table 8-5—TID subfield**

|  |  |  |
| --- | --- | --- |
| **Access Policy** | **Usage** | **Allowed values in bits 0-3 (TID subfield)** |
| EDCA | UP for either TC or TS, regardless of whether admission control is required | 0-7See NOTE |
| HCCA | TSID | 8-15 |
| HEMM | TSID, regardless of the access mechanism used | 8-15 |
| NOTE—A value of 0 is the only allowed value in the TID subfield in a frame transmitted from a STA where dot11QoSSimplificationImplemented is true. |

**8.4.1.14 Block Ack Parameter Set field**

***Insert the following sentence at the end of the paragraph beginning with “The TID subfield...”:***

In ADDBA Request frames from a STA where dot11QoSSimplificationImplemented is true, the TID subfield is equal to 0.

**8.4.2.29 Extended Capabilities element**

***Insert a row in Table 8-103 as follows (note that the entire table is not shown here):***

**Table 8-103—Capabilities field**

|  |  |  |
| --- | --- | --- |
| **Bit** | **Information** | **Notes** |
| <ANA> | QoS Simplification | The STA sets the QoS Simplification field to 1 when dot11QoSSimplificationImplemented is TRUE, and sets it to 0 otherwise. |

**9.2.4.2 HCF contention-based channel access (EDCA)**

***Insert the following paragraph at the end of section 9.2.4.2:***

The UP-to-AC mappings in Table 9-1 apply only in the case when dot11QoSSimplificationImplemented is false. When dot11QoSSimplificationImplemented is true, a STA shall not follow the mappings in Table 9-1; instead, the STA shall maintain only a single access category for data frames and shall map UP values 0 through 7 to access category AC\_BE.

**9.19.2.1 Reference implementation**

***Insert the following paragraph after Figure 9-19:***

Support for multiple EDCAFs is mandatory only when dot11QoSSimplificationImplemented is false. When dot11QoSSimplificationImplemented is true, a STA shall maintain only a single transmit queue for data frames.

**9.21.2 Setup and modification of the Block Ack parameters**

***Change the first paragraph as follows:***

An originator that intends to use the Block Ack mechanism for the transmission of QoS data frames to an intended recipient should first check whether the intended recipient STA is capable of participating in Block Ack mechanism by discovering and examining its Delayed Block Ack and Immediate Block Ack capability bits. If the intended recipient STA is capable of participating, the originator sends an ADDBA Request frame indicating the TID for which the Block Ack is being set up. For an originator where dot11QoSSimplificationImplemented is true, the TID is 0. For an ADDBA set up between STAs where one is a non-HT STA, the Block Ack Policy and Buffer Size fields in the ADDBA Request frame are advisory and may be changed by the recipient. The Buffer Size field in the ADDBA Request frame is advisory and may be changed by the recipient for an ADDBA set up between HT STAs.

**Annex C**

***Change Dot11StationConfigEntry as shown to add the definition of dot11QoSSimplificationImplemented***

Dot11StationConfigEntry ::= SEQUENCE

 {

 …

 dot11RobustAVStreamingImplemented TruthValue,

 dot11MultibandImplemented TruthValue,

 dot11DynamicEIFSActivated TruthValue,
dot11QoSSimplificationImplemented TruthValue

}

***Insert the definition of dot11QoSSimplificationImplemented as follows:***

dot11QoSSimplificationImplemented OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-only

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

 This attribute, when true, indicates that the STA supports the QoS Simplification feature. Otherwise, it is false. The default value of this attribute is false."

 DEFVAL { false }

 ::= { dot11StationConfigEntry <ANA> }

***Change dot11SMTbase12 as follows: (this deprecates the group)***

dot11SMTbase12 OBJECT-GROUP

 OBJECTS {

 …

 dot11PSMPOptionImplemented }

 STATUS ~~current~~deprecated

 DESCRIPTION

 "Superseded by dot11SMTbase12.
The SMTbase12 object class provides the necessary support at the STA to manage the processes in the STA such that the STA may work cooperatively as a part of an IEEE Std(#130) 802.11 network."

 ::= { dot11Groups 57 }

***Insert the following new group at the end of dot11Groups:***

dot11SMTbase13 OBJECT-GROUP

 OBJECTS {

 dot11MediumOccupancyLimit,

 dot11CFPollable,

 dot11CFPPeriod,

 dot11CFPMaxDuration,

 dot11AuthenticationResponseTimeOut,

 dot11PrivacyOptionImplemented,

 dot11PowerManagementMode,

 dot11DesiredSSID,

 dot11DesiredBSSType,

 dot11OperationalRateSet,

 dot11BeaconPeriod,

 dot11DTIMPeriod,

 dot11AssociationResponseTimeOut,

 dot11DisassociateReason,

 dot11DisassociateStation,

 dot11DeauthenticateReason,

 dot11DeauthenticateStation,

 dot11AuthenticateFailStatus,

 dot11AuthenticateFailStation,

 dot11MultiDomainCapabilityImplemented,

 dot11MultiDomainCapabilityActivated,

 dot11CountryString,

 dot11SpectrumManagementImplemented,

 dot11SpectrumManagementRequired,

 dot11RSNAOptionImplemented,

 dot11OperatingClassesImplemented,

 dot11OperatingClassesRequired,

 dot11QosOptionImplemented,

 dot11ImmediateBlockAckOptionImplemented,

 dot11DelayedBlockAckOptionImplemented,

 dot11DirectOptionImplemented,

 dot11APSDOptionImplemented,

 dot11QAckOptionImplemented,

 dot11QBSSLoadImplemented,

 dot11QueueRequestOptionImplemented,

 dot11TXOPRequestOptionImplemented,

 dot11MoreDataAckOptionImplemented,

 dot11AssociateInNQBSS,

 dot11DLSAllowedInQBSS,

 dot11DLSAllowed,

 dot11AssociateStation,

 dot11AssociateID,

 dot11AssociateFailStation,

 dot11AssociateFailStatus,

 dot11ReassociateStation,

 dot11ReassociateID,

 dot11ReassociateFailStation,

 dot11ReassociateFailStatus,

 dot11RadioMeasurementImplemented,

 dot11RadioMeasurementActivated,

 dot11RMMeasurementProbeDelay,

 dot11RMMeasurementPilotPeriod,

 dot11RMLinkMeasurementActivated,

 dot11RMNeighborReportActivated,

 dot11RMParallelMeasurementsActivated,

 dot11RMRepeatedMeasurementsActivated,

 dot11RMBeaconPassiveMeasurementActivated,

 dot11RMBeaconActiveMeasurementActivated,

 dot11RMBeaconTableMeasurementActivated,

 dot11RMBeaconMeasurementReportingConditionsActivated,

 dot11RMFrameMeasurementActivated,

 dot11RMChannelLoadMeasurementActivated,

 dot11RMNoiseHistogramMeasurementActivated,

 dot11RMStatisticsMeasurementActivated,

 dot11RMLCIMeasurementActivated,

 dot11RMLCIAzimuthActivated,

 dot11RMTransmitStreamCategoryMeasurementActivated,

 dot11RMTriggeredTransmitStreamCategoryMeasurementActivated,

 dot11RMAPChannelReportActivated,

 dot11RMMIBActivated,

 dot11RMMaxMeasurementDuration,

 dot11RMNonOperatingChannelMaxMeasurementDuration,

 dot11RMMeasurementPilotTransmissionInformationActivated,

 dot11RMMeasurementPilotActivated,

 dot11RMNeighborReportTSFOffsetActivated,

 dot11RMRCPIMeasurementActivated,

 dot11RMRSNIMeasurementActivated,

 dot11RMBSSAverageAccessDelayActivated,

 dot11RMBSSAvailableAdmissionCapacityActivated,

 dot11FastBSSTransitionImplemented,

 dot11LCIDSEImplemented,

 dot11LCIDSERequired,

 dot11DSERequired,

 dot11ExtendedChannelSwitchActivated,

 dot11HighThroughputOptionImplemented,

 dot11WirelessManagementImplemented,

 dot11MeshActivated,

 dot11RSNAPBACRequired,

 dot11PSMPOptionImplemented,
dot11QoSSimplificationImplemented }

 STATUS current

 DESCRIPTION

 "The SMTbase13 object class provides the necessary support at the STA to manage the processes in the STA such that the STA may work cooperatively as a part of an IEEE Std 802.11 network."

 ::= { dot11Groups <ANA> }

***Change dot11Compliance as follows:***

dot11Compliance MODULE-COMPLIANCE

 STATUS current

 DESCRIPTION

 "The compliance statement for SNMPv2 entities that implement the IEEE Std 802.11 MIB."

 MODULE -- this module

 MANDATORY-GROUPS {

 dot11SMTbase1~~2~~3,

 dot11MACbase3,

 dot11CountersGroup3,

 dot11SmtAuthenticationAlgorithms,

 dot11ResourceTypeID,

 dot11PhyOperationComplianceGroup2 }

…

 ::= { dot11Compliances 1 }