Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**AES-CCM Text clarification**	
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Re:	IEEE P802.16e/D4-2004	
Abstract	Proposal for AES-CCM text change	
Purpose	Review and Adopt the suggested changes into P802.16e/D4	
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AES-CCM clarification

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Introduction

AES-CCM has defined in addition to DES-CBC, however in current text there are some ambiguities needed to clear up. In this contribution we propose to change following

- “Little-endian” byte ordering specified for PN and ICV to big-endian ordering

Byte Ordering

802.16 specified big-endian byte ordering in Generic MAC header (see figure 1), and it is a basic assumption for packet format and other attribute has more than one octet. However AES-CCM specified little-endian ordering for PN and ICV. It is because AES-CCM specification specify initial block B0 and Ai in little-endian order (see figure 1). It is desirable to have big-endian byte ordering for PN and ICV for sake of consistency with GMH and other packet formats

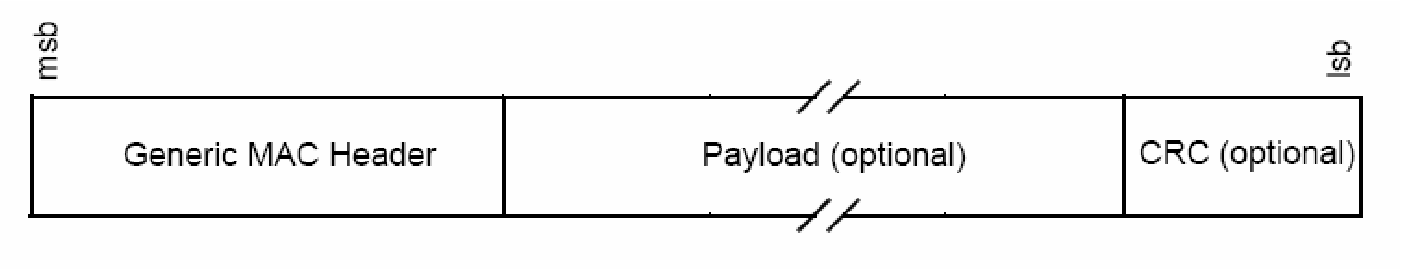
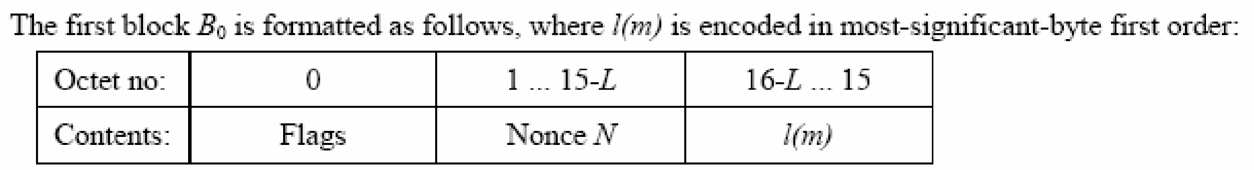


Figure 21—MAC PDU formats

Figure-1 MAC PDU formats



The first block B_0 is formatted as follows, where *l(m)* is encoded in most-significant-byte first order:

Octet no:	0	1 ... 15-*L*	16-*L* ... 15
Contents:	Flags	Nonce *N*	*l(m)*

Figure-2 (Initial Block B0 specified in NIST SP 800-38C)

Proposed Text

7.5.1.2.1 PDU Payload Format

The PDU Payload shall be prepended with a 4 byte PN (Packet Number). The PN shall be transmitted in big~~little~~ endian byte order. The PN shall not be encrypted.

The plaintext PDU shall be encrypted and authenticated using the active TEK, according to the CCM specification. This includes appending an 8 bytre ICV (Integrity Check Value) to the end of the payload and encrypting the both the plaintext payload and the appended ICV.

The ciphertext ICV is transmitted in big~~little~~ endian byte order.

The processing yields payload that is 12 bytes longer than the plaintext payload.