



# **Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirement —**

## **Part 21: Media independent services framework**

TECHNICAL CORRIGENDUM 1: Clarification of parameter definition in group session key derivation

*Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseaux locaux et métropolitains — Exigences spécifiques —*

*Partie 21: Cadre des services indépendants des supports*

*RECTIFICATIF TECHNIQUE 1*

Technical Corrigendum 1 to ISO/IEC/IEEE 8802-21:2018 was prepared by the LAN/MAN of the IEEE Computer Society (as IEEE Std 802.21-2017/Cor 1-2017) and drafted in accordance with its editorial rules. It was adopted, under the “fast-track procedure” defined in the Partner Standards Development Organization cooperation agreement between ISO and IEEE, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.



**IEEE Standard for  
Local and metropolitan area networks—**

**Part 21: Media Independent Services  
Framework—Corrigendum 1:  
Clarification of Parameter Definition  
in Group Session Key Derivation**

Sponsor

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**Abstract:** This corrigendum provides technical and editorial corrections to IEEE Std 802.21-2017.

**Keywords:** group, group session key, IEEE 802.21™, master group key, media independent session key

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## Introduction

This introduction is not part of IEEE Std 802.21-2017/Cor 1-2017, IEEE Standard for Local and metropolitan area networks—Part 21: Media Independent Services Framework—Corrigendum 1: Clarification of Parameter Definition in Group Session Key Derivation.

This corrigendum provides technical clarifications and editorial corrections to the parameter definition in group session key derivation published in IEEE Std 802.21-2017.

## Contents

9. MIS protocol protection .....	10
9.6 Group addressed message protection.....	10

**IEEE Standard for  
Local and metropolitan area networks—**

**Part 21: Media Independent Services  
Framework—Corrigendum 1:  
Clarification of Parameter Definition  
in Group Session Key Derivation**

NOTE—The editing instructions contained in this corrigendum define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

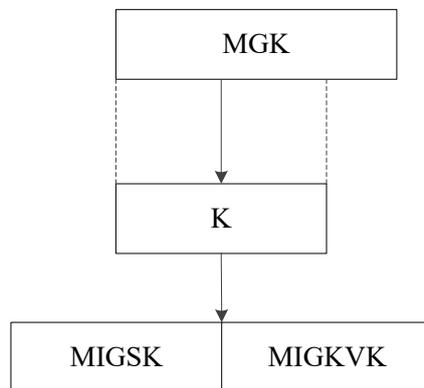
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## 9. MIS protocol protection

### 9.6 Group addressed message protection

*Change 9.6.1 as follows:*

#### 9.6.1 Group session key derivation



**Figure 73—Key derivation example**

When a recipient of a GKB successfully decrypts an MGK from the GKB, a media independent group session key (MIGSK) is derived from the MGK to protect group manipulation commands and group addressed commands:

For the key derivation, the following notations and parameters are used:

- $K$ : key derivation key. It is truncated from a master group key (MGK). The length of  $K$  is determined by the pseudorandom function (PRF) used for key derivation. If HMAC-SHA-1 or HMAC-SHA-256 is used as a PRF, then the full MGK is used as key derivation key,  $K$ . If CMAC-AES is used as a PRF, then the first 128 bits of MGK are used as derivation key,  $K$ .
- $L$ : The binary length of derived keying material MIGSK and MIGKVK.  $L = L1 + L2$ ; where  $L1$  is determined by selected group ciphersuite (described in 9.6.5) and  $L2$  is determined by group key distribution ciphersuites (described in 9.6.6).
- $h$ : The output binary length of PRF used in the key derivation. That is,  $h$  is the length of the block of the keying material derived by one PRF execution. Specifically, for HMAC-SHA-1,  $h = 160$  bits; for HMAC-SHA-256,  $h = 256$  bits; for CMAC-AES,  $h = 128$  bits.
- $n$ : The number of iterations of PRF in order to generate  $L$ -bits keying material.
- $c$ : The group ciphersuite code is a one octet string specified for each ciphersuite. The code is defined in 9.6.5.
- $v$ : The length of the binary representation of the counter and the length of keying material  $L$ . The default value for  $v$  is 32.
- “MIGSK”: 0x4D4947534B, ASCII code in hex for string “MIGSK.”
- $[a]_2$ : Binary representation of integer  $a$  with a given length.

For given PRF, the key derivation for MIGSK and MIGKVK can be described in the following procedures:

**Fixed input values:**  $h$  and  $v$ .

**Input:**  $K$ ,  $L$ , and group ciphersuite code.

**Process:**

- a)  $n := \lceil L/h \rceil$
- b) If  $n > 2^v - 1$ , then indicate an error and stop.
- c) Result(0) := empty string.
- d) For  $i = 1$  to  $n$ , do
  - 1)  $K(i) := \text{PRF}(K, \text{"MIGSK"} \parallel [i]_2 \parallel c \parallel [L]_2)$ .
  - 2) Result( $i$ ) = Result( $i - 1$ )  $\parallel$   $K(i)$ .
- e) Return Result( $n$ ). ~~and~~ MIGSK is the leftmost  $L$ -bits of Result( $n$ ) and its length is represented as  $L1$ . MIGKVK is the remaining leftmost bits of Result( $n$ ) and its length is represented as  $L2$ . If  $L2$  is '0', MIGKVK is not included.

**Output:** MIGSK  $\parallel$  MIGKVK.

With the above procedure, a key hierarchy is derived as shown in Figure 73.

This mechanism conforms with NIST SP800-108 (KDF in Counter Mode).

### 9.6.5 Group ciphersuites

*Change Table 27 as follows:*

**Table 27—Group ciphersuites**

Code	Encryption algorithm	Digital signature algorithm	<u><math>L1</math></u>
10000100	NULL	ECDSA-256	<u>0</u>
10010001	AES_CCM-128	NULL	<u>128</u>
10010101	AES_CCM-128	ECDSA-256	<u>128</u>

### 9.6.6 Group key distribution ciphersuites

*Change Table 28 as follows:*

**Table 28—Group key distribution ciphersuites**

Code	Wrapping algorithm	MAC algorithm for VerifyGroupCode	<u><math>L2</math></u>
11010100	AES_Key_Wrapping-128	NULL	<u>0</u>
11000100	AES_ECB-128	NULL	<u>0</u>
11000101	AES_ECB-128	AES-CMAC-128	<u>128</u>
11000000	No group key distribution	NULL	<u>0</u>