Clarifications in the specification of ELmD v1.0

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In this short note, we clarify some issues, that were not properly mentioned in the specification of ELmD v1.0.

1 ELmD Tagged Ciphertext Generation when $t = 0$.

The tagged ciphertext algorithm is given for non-zero $t$ and we mentioned that, for $t = 0$, no intermediate tag is generated i.e. $T$ is empty. Note that, the definition of $C[i]$ is given as: $C[i] = CC[i] \oplus 3^2 \cdot 2^{i-1+\lfloor \frac{i-1}{t} \rfloor} \cdot L$. Although we meant, $\lfloor \frac{i-1}{t} \rfloor = 0$ for $t = 0$ but as it was not properly mentioned in the specification, it might lead to some confusion. Here, we provide the ELmD algorithm for $t = 0$ more formally, to remove any confusion:

$$W[0] = IV$$
$$M[l+1] = \oplus_{i=1}^{l} M[i]$$
$$MM[i] = M[i] \oplus 2^{i-1} \cdot L \quad \text{for} \quad i = 1 \text{ to } (l - 1)$$
$$MM[l] = \begin{cases} 
M[l] \oplus 2^{l-1} \cdot L & \text{if } |M^*[l]| = 128 \\
M[l] \oplus 7 \cdot 2^{l-2} \cdot L & \text{else}
\end{cases}$$
$$MM[l+1] = \begin{cases} 
M[l+1] \oplus 2^{l} \cdot L & \text{if } |M^*[l]| = 128 \\
M[l+1] \oplus 7 \cdot 2^{l-1} \cdot L & \text{else}
\end{cases}$$
$$X[i] = E_K(MM[i]) \quad \text{for} \quad i = 1 \text{ to } (l + 1)$$
$$(Y[i], W[i]) = \rho(X[i], W[i - 1]) \quad \text{for} \quad i = 1 \text{ to } (l + 1)$$
$$CC[i] = E^{-1}_K(Y[i]) \quad \text{for} \quad i = 1 \text{ to } l$$
$$C[i] = CC[i] \oplus 3^2 \cdot 2^{i-1} \cdot L \quad \text{for} \quad i = 1 \text{ to } l$$
$$CC[l+1] = E^{-1}_K(Y[l+1] \oplus 1)$$
$$C[l+1] = CC[l+1] \oplus 3^2 \cdot 2^{l} \cdot L$$

2 Description of AES$^r$.

For $r$ round AES encryption, $r$ rounds of encryptions are used. In the specification, we have mentioned it as $r + 1$ rounds of encryption, which was a typo. In the recommended parameter set, we have used AES$^{10}$ and AES$^{5}$. AES$^{10}$ is the standard 10 round AES-encryption, where the mix column operation is skipped in the last round. For AES$^{5}$, we will have the last round mix-column operation - hence have 5 full round encryptions. In general, when $r < 10$, AES$^{r}$, we will have the last round mix-column operation - hence have $r$ full round encryption.