

Definition: Enc-Forge _{\mathcal{A}, Π} (n): Run $\text{Gen}(1^n)$ to obtain k . Adversary \mathcal{A} is given input 1^n and access to an encryption oracle $\text{Enc}_k(\cdot)$. They output ciphertext c . Let $m := \text{Dec}_k(c)$, and let Q denote the set of all queries that \mathcal{A} asked its encryption oracle. The output of the

experiment is 1 iff $m \neq \perp$ and $m \notin Q$.

Definition: Unforgeable: A private-key encryption scheme Π such that for all PPT adversaries \mathcal{A} , $\Pr[\text{Enc-Forge}_{\mathcal{A}, \Pi}(n) = 1] \leq \text{negl}(n)$.

Definition: Authenticated: A private-key encryption scheme that is CCA-secure and unforgeable.