

A trace has been found.

Abbreviations
$\sim M = \text{AES_enc}(\text{rand2}, (\text{seed}, \text{rand2})), \text{derive_key}(\text{encryption_key}, \text{privacy_const}), \text{privacyIV})$
$\sim M_1 = \text{Mode_E2E}$
$\sim M_2 = \text{AES_enc}(\text{AES_enc}(\text{rand2}, (\text{seed}, \text{rand2})), \text{derive_key}(\text{encryption_key}, \text{privacy_const}), \text{privacyIV}), \text{Mode_E2E}), \text{derive_key}(\text{encryption_key}, \text{signature_const}), \text{privacyIV})$
$\sim M_3 = \text{adv}$
$\sim M_4 = \text{AES_enc}(\text{rand2_2}, (\text{seed}, \text{rand2_2})), \text{derive_key}(\text{encryption_key}, \text{privacy_const}), \text{privacyIV})$
$\sim M_5 = \text{Mode_E2E}$
$\sim M_6 = \text{AES_enc}(\text{AES_enc}(\text{rand2_2}, (\text{seed}, \text{rand2_2})), \text{derive_key}(\text{encryption_key}, \text{privacy_const}), \text{privacyIV}), \text{Mode_E2E}), \text{derive_key}(\text{encryption_key}, \text{signature_const}), \text{privacyIV})$
$\sim M_7 = \text{adv}$

Honest Process

Attacker

