

Challenger

G
 Q_1, Q_2, Q_3

Randomly choose $\{u_i\}, \{r_j\}, \{t_{ij}\}$ in $[1, n)$
for $1 \leq i \leq v$ and $1 \leq j \leq c$,
assemble $L_{ij}^m = ([r_j]G, t_{ij}, [u_i r_j]G)$.

Randomly choose a in $[1, c]$, t' in $[1, n)$,
assemble $L' = ([r_a]G, t', [r_a]Q_1)$.

Randomly choose b in $[1, c]$ and $b \neq a$,
replace $L_{i,b}^m$ with $(Q_2, t_{i,b}, [u_i]Q_2)$.

Randomly choose $\{u_k''\}$ and $\{t_k''\}$ in $[1, n)$
for $1 \leq k \leq w$,
assemble $L_k'' = (Q_2, t_k'', [u_k'']Q_2)$.

Randomly choose d in $[1, w]$,
replace L_d'' with (Q_2, t_d'', Q_3) .

RP-based Linkage Adversary

$$\begin{aligned}\mathcal{L}^m &= \{L_{ij}^m; 1 \leq i \leq v, 1 \leq j \leq v\} \\ L' &= ([r_a]G, t', [r_a]Q_1) \\ L'' &= \{L_k''; 1 \leq k \leq w, k \neq d\} \\ &= \{(Q_2, t_k'', [u_k'']Q_2)\} \\ L_d'' &= (Q_2, t_d'', Q_3)\end{aligned}$$

u' in $\{u_1'', u_2'', \dots, u_w''\}$
or not

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