

$m_s, m_c$	modulus in Paillier generated by $(\mathcal{S}, \mathcal{C})$
$g_s, g_c$	base in Paillier generated by $(\mathcal{S}, \mathcal{C})$
$PK_s, PK_c$	public keys of $\mathcal{S}$ and $\mathcal{C}$
$SK_s, SK_c$	private keys of $\mathcal{S}$ and $\mathcal{C}$
$E_s(x), E_c(x)$	Encryption of message $x$ using $(PK_s, PK_c)$
$[x]_s, [x]_c$	denotes $x$ is encrypted using $(PK_s, PK_c)$
$D_s([x]_s), D_c([x]_c)$	Decryption of ciphertext $x$ using $(SK_s, SK_c)$
$d(a, b)$	Distance between points $a$ and $b$
$\mathcal{U}_s, \mathcal{U}_c$	user sets of $\mathcal{S}$ and $\mathcal{C}$
$\mathcal{U}$	superset of $\mathcal{U}_s$ and $\mathcal{U}_c$
$\mathcal{U}_I$	$\mathcal{U}_s \cap \mathcal{U}_c$
$n, n_s, n_c, n_I$	total number of users in $(\mathcal{U}, \mathcal{U}_s, \mathcal{U}_c, \mathcal{U}_I)$
$\mathcal{F}$	set of existing facilities of $\mathcal{C}$
$k$	total number of existing facilities
$q, \mathcal{Q}$	result (value, set) of the query
$w$	random number greater than $q$ in MAXQ