

$$\boxed{\boxed{C}} \\ K_{C,KAS}$$

$$\boxed{\boxed{KAS}} \\ K_{C,KAS}, K_{KAS,TGS}$$

$$n_1 \leftarrow \{0, 1\}^{\lambda_1}$$

$$\xrightarrow{id_C, id_{TGS}, n_1}$$

$$k_{C,TGS} \leftarrow \{0, 1\}^{\lambda_1}$$

$$TGT \leftarrow \text{Enc}_{K_{KAS,TGS}}(k_{C,TGS}, ts_{KAS}, id_C)$$

$$ct_1 \leftarrow \text{Enc}_{K_{C,KAS}}(k_{C,TGS}, n_1, ts_{KAS}, id_{TGS})$$

$$\xleftarrow{id_C, TGT, ct_1}$$

$$(k'_{C,TGS}, n'_1, ts'_{KAS}, id'_{TGS}) \leftarrow \text{Dec}_{K_{C,KAS}}(ct_1)$$

$$\text{verify } n'_1, ts'_{KAS}, id'_{TGS}$$

$$\boxed{\boxed{TGS}} \\ K_{KAS,TGS}, K_{TGS,S}$$

$$ct_2 \leftarrow \text{Enc}_{k'_{C,TGS}}(id_C, ts_C)$$

$$n_3 \leftarrow \{0, 1\}^{\lambda_1}$$

$$\xrightarrow{TGT, ct_2, id_S, n_3}$$

$$k_{C,S} \leftarrow \{0, 1\}^{\lambda_1}$$

$$(k'_{C,TGS}, ts'_{KAS}, id'_C) \leftarrow \text{Dec}_{K_{KAS,TGS}}(TGT)$$

$$\text{verify } ts'_{KAS}$$

$$(id''_C, ts'_C) \leftarrow \text{Dec}_{k'_{C,TGS}}(ct_2)$$

$$\text{verify } (id'_C = id''_C), ts'_C$$

$$ST \leftarrow \text{Enc}_{K_{TGS,S}}(k_{C,S}, ts_{TGS}, id'_C)$$

$$ct_3 \leftarrow \text{Enc}_{k'_{C,TGS}}(k_{C,S}, n_3, ts_{TGS}, id_S)$$

$$\xleftarrow{id_C, ST, ct_3}$$

$$(k'_{C,S}, n'_3, ts'_{TGS}, id'_S) \leftarrow \text{Dec}_{k_{C,TGS}}(ct_3)$$

$$\text{verify } n'_3, ts'_{TGS}, id'_S$$

$$ct_4 \leftarrow \text{Enc}_{k'_{C,S}}(id_C, ts_C^\dagger)$$

$$\xrightarrow{ST, ct_3}$$

$$(k''_{C,S}, ts''_{TGS}, id'''_C) \leftarrow \text{Dec}_{K_{TGS,S}}(ST)$$

$$\text{verify } ts''_{TGS}$$

$$(id''''_C, ts'_C) \leftarrow \text{Dec}_{k''_{C,S}}(ct_4)$$

$$\text{verify } (id'''_C = id''''_C), ts_C^\dagger$$

$$ct_5 \leftarrow \text{Enc}_{k''_{C,S}}(ts_C^\dagger)$$

$$\xleftarrow{ct_5}$$

$$ts_C^{\dagger\dagger} \leftarrow \text{Dec}_{k_{C,S}}(ct_5)$$

$$\text{verify } ts_C^\dagger = ts_C^{\dagger\dagger}$$

ACCEPT

ACCEPT

$$\boxed{\boxed{S}} \\ K_{TGS,S}$$