

$sk(I), pk(I), pk(R)$

I

nonce ni

$\left\{ \left\langle I, \{ni\}_{pk(R)} \right\rangle \right\}_{pk(R)}$

$\left\{ \left\langle R, \{ni\}_{pk(I)} \right\rangle \right\}_{pk(I)}$

ni is secret

$sk(R), pk(R), pk(I)$

R