

## User certificate

$K_{\text{Alice}}^+$
U:0010011100
$\text{sig}(\text{O}, \{\text{U}, K_{\text{Alice}}^+\})$

(a)

## Replica certificate

$K_{\text{Repl}}^+$
R:1100011100
$\text{sig}(\text{O}, \{\text{R}, K_{\text{Repl}}^+\})$

(b)

## Administrative certificate

$K_{\text{Adm}}^+$
R:1101111100
U:0110011111
D:1
$\text{sig}(\text{O}, \{\text{R}, \text{U}, \text{D}, K_{\text{Adm}}^+\})$

(c)