Authentication

Authentication

Goal: Bob wants Alice to “prove” her identity to him

Protocol ap1.0: Alice says “I am Alice”



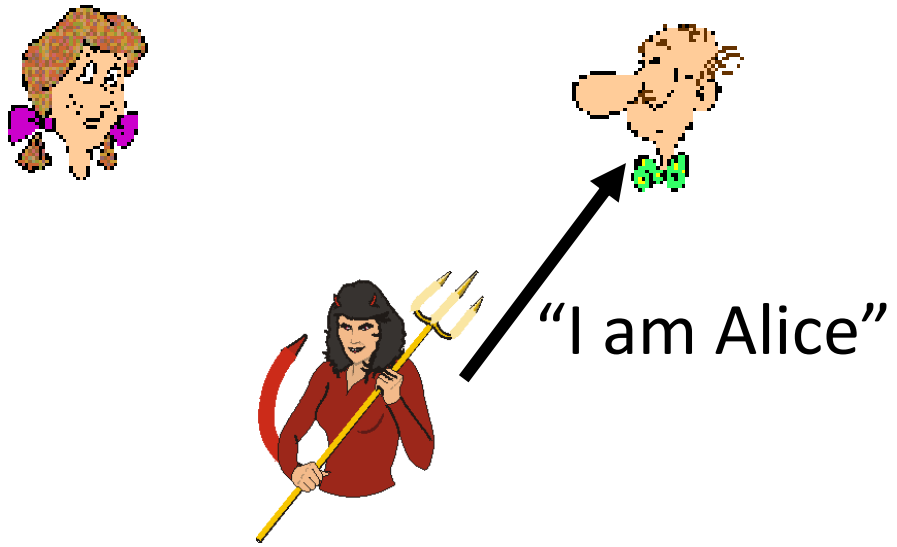
failure scenario??



Authentication

Goal: Bob wants Alice to “prove” her identity to him

Protocol ap1.0: Alice says “I am Alice”



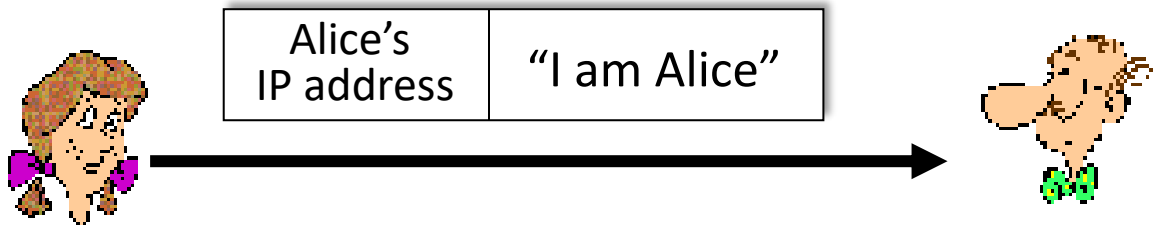
in a network, Bob can not “see” Alice, so Trudy simply declares herself to be Alice



Authentication: another try

Goal: Bob wants Alice to “prove” her identity to him

Protocol ap2.0: Alice says “I am Alice” in an IP packet containing her source IP address



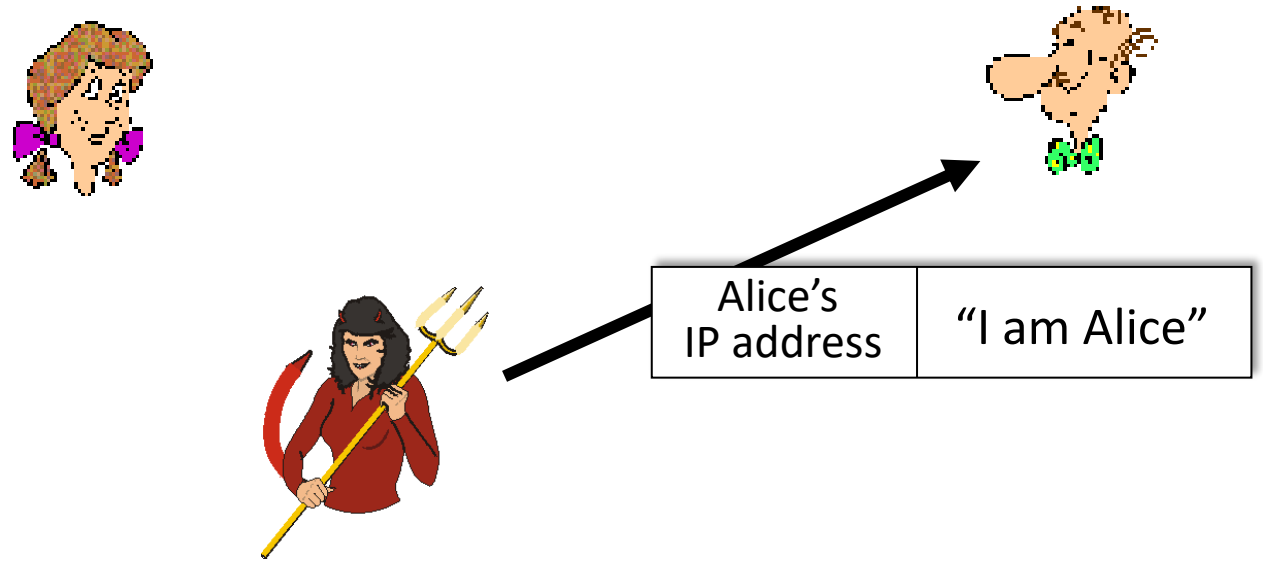


failure scenario??

Authentication: another try

Goal: Bob wants Alice to “prove” her identity to him

Protocol ap2.0: Alice says “I am Alice” in an IP packet containing her source IP address

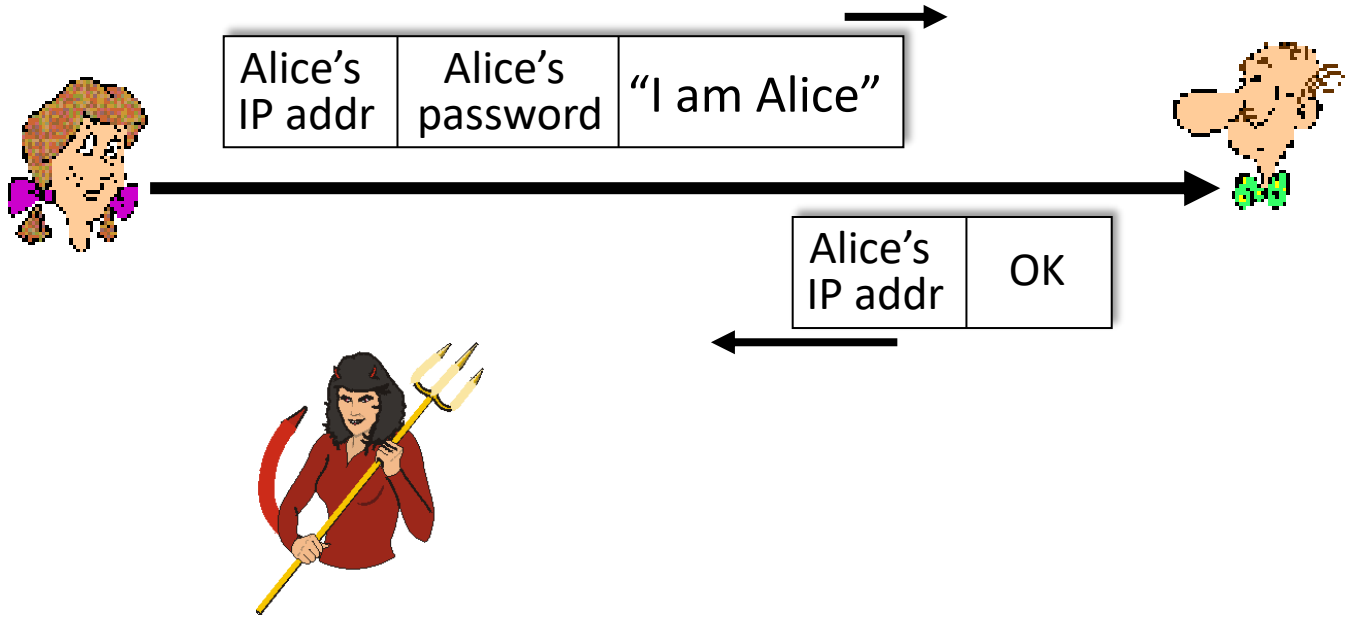


Trudy can create a packet “spoofing” Alice’s address

Authentication: a third try

Goal: Bob wants Alice to "prove" her identity to him

Protocol ap3.0: Alice says "I am Alice" Alice says "I am Alice" and sends her secret password to "prove" it.

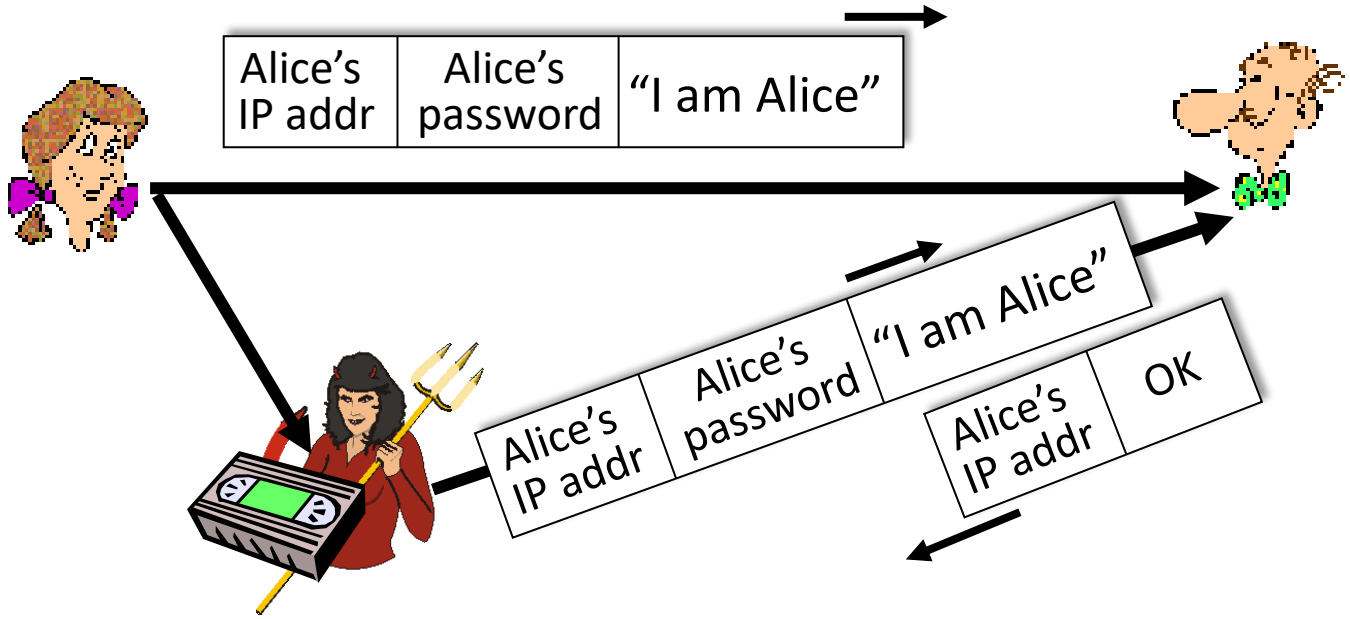


failure scenario??

Authentication: a third try

Goal: Bob wants Alice to "prove" her identity to him

Protocol ap3.0: Alice says "I am Alice" Alice says "I am Alice" and sends her secret password to "prove" it.

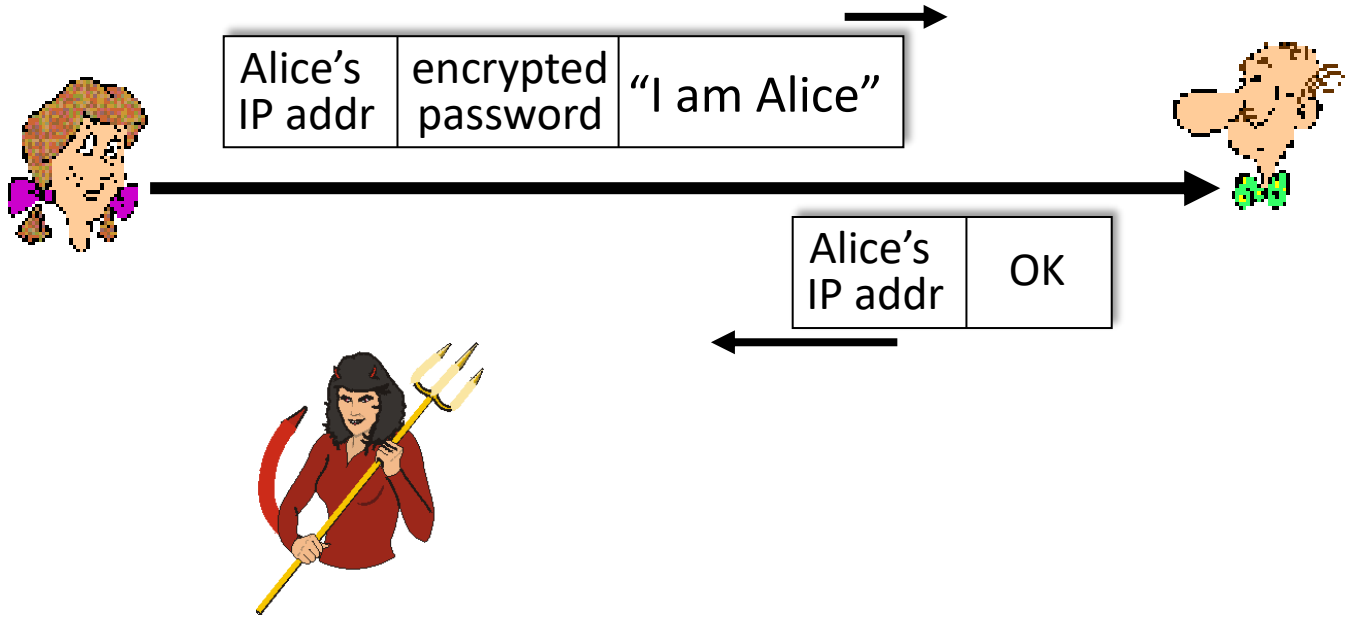


playback attack:
Trudy records Alice's packet and later plays it back to Bob

Authentication: a modified third try

Goal: Bob wants Alice to "prove" her identity to him

Protocol ap3.0: Alice says "I am Alice" Alice says "I am Alice" and sends her encrypted secret password to "prove" it.

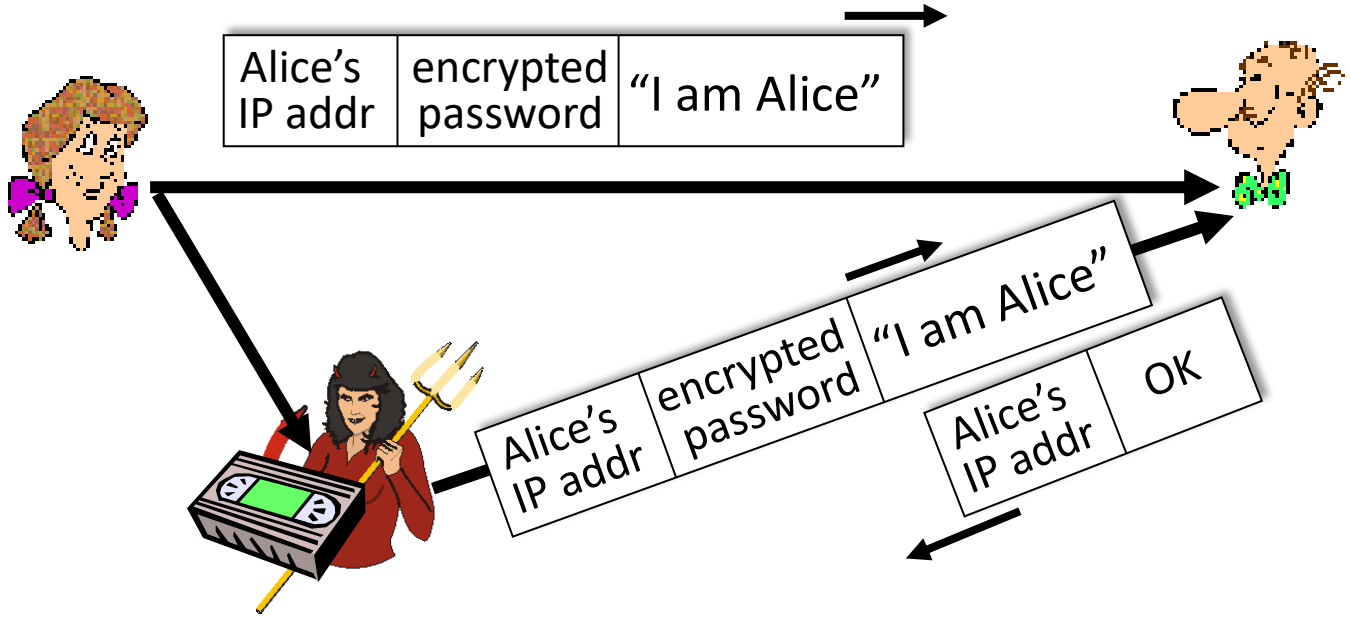


failure scenario??

Authentication: a modified third try

Goal: Bob wants Alice to "prove" her identity to him

Protocol ap3.0: Alice says "I am Alice" Alice says "I am Alice" and sends her encrypted secret password to "prove" it.



playback attack still works: Trudy records Alice's packet and later plays it back to Bob

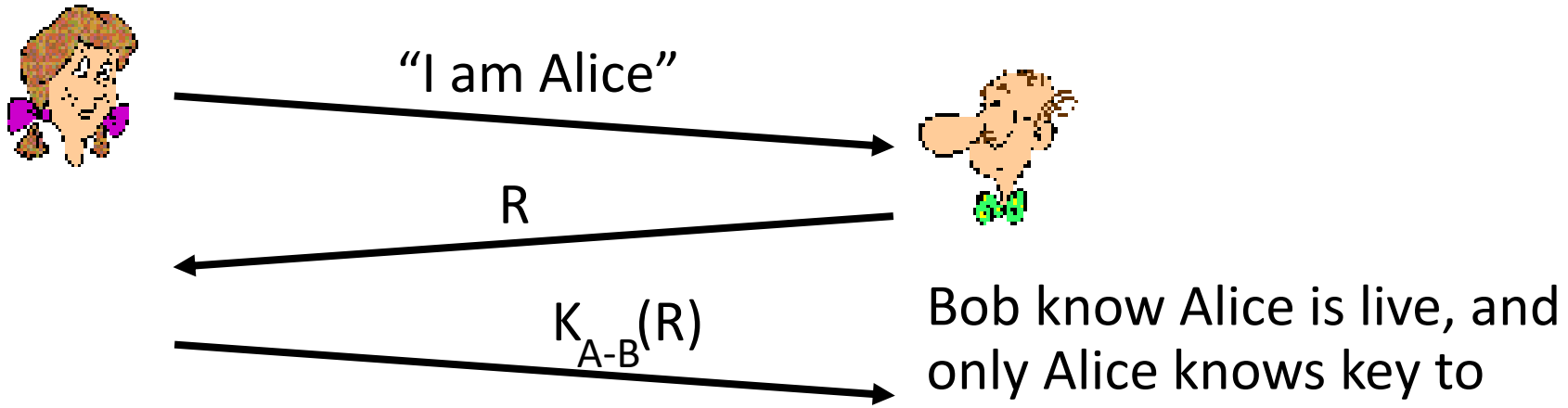
Authentication: a fourth try

Goal: avoid playback attack

nonce: number (R) used only once-in-a-lifetime

protocol ap4.0: to prove Alice "live", Bob sends Alice nonce, R

- Alice must return R, encrypted with shared secret key



Failures, drawbacks?

Authentication: ap5.0

ap4.0 requires shared symmetric key - can we authenticate using public key techniques?

ap5.0: use nonce, public key cryptography

