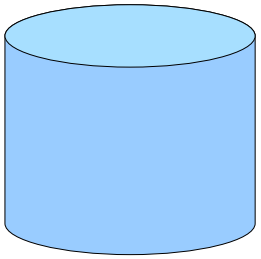
Integrity policies via a library in Haskell

Alejandro Russo
russo@chalmers.se

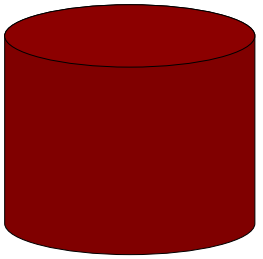
(joint work-in-progress with Albert Diserholt)

Password administrator

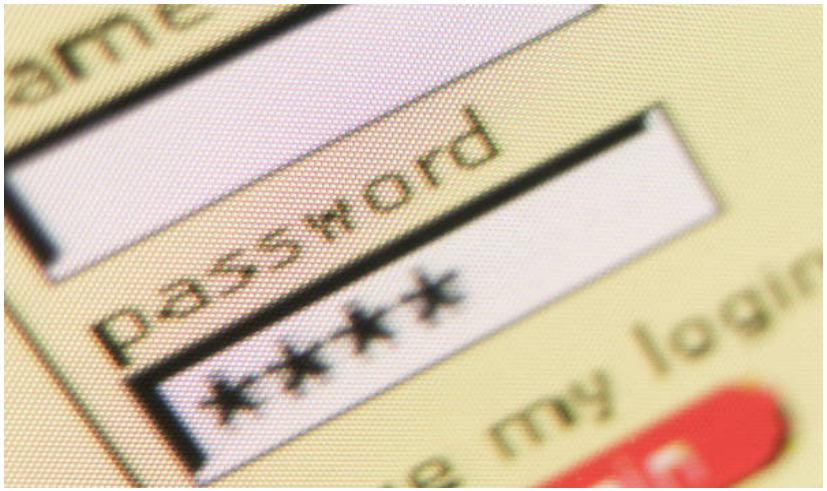
- Password administrators are commonly found in browsers, mobiles phones, desktop computers, etc.
- Inspired by Linux's Shadow Password Suite.
- Provide an API to manage passwords and perform authentication.
  - Root permission!



/etc/passwd



/etc/shadow



Challenges when designing the API

- Security concerns?
  - Confidentiality
  - Integrity
- Password should not be leaked.
  - Offline dictionary attacks
- Password can be destroyed or manipulated.
  - Denial of service attacks.
  - Facilitate penetration of systems.

Module	Confidentiality	Integrity
Login	Information to leak: comparation of password with user input. Otherwise, password must not be leaked.	File **passwd** and **shadow** can only be read.
Reset	Passwords must not be leaked.	File **passwd** can only be read, while **shadow** can be read and written. New password must be difficult to guess.
Backup	Password must not be leaked unless they are safely encrypted.	File **passwd** and **shadow** can only be read.
Encrypt	Passwords must not be leaked.	User input must not affect the generation of random numbers.

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Data invariants

Information-flow