



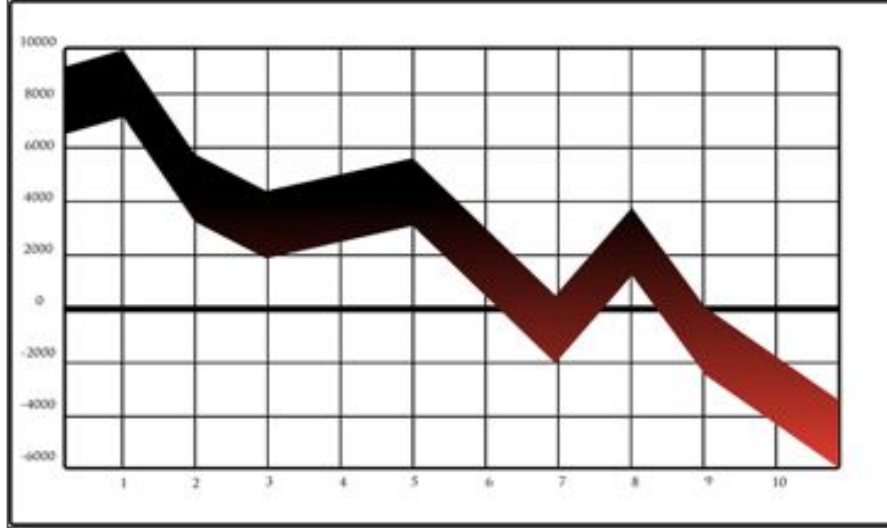
A trust in time saves millions

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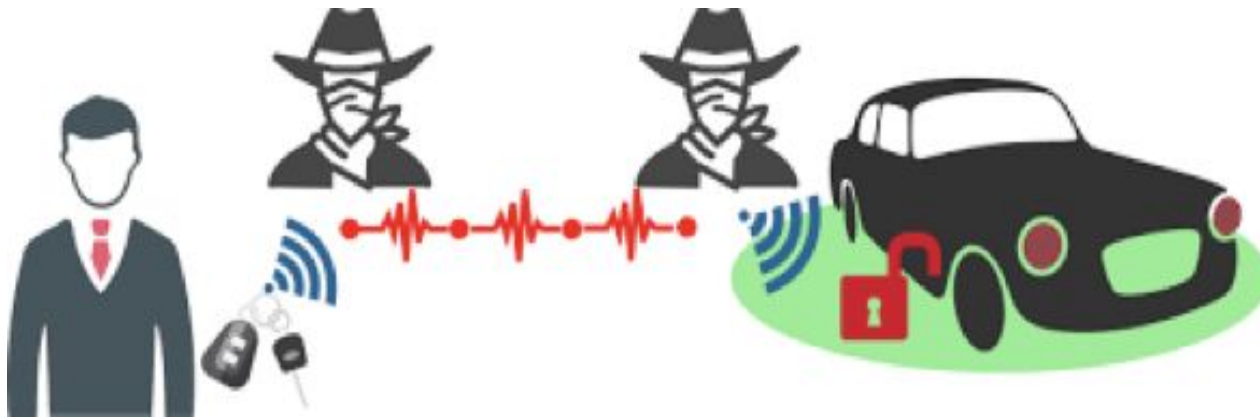
UCLA



Illegal
Trade

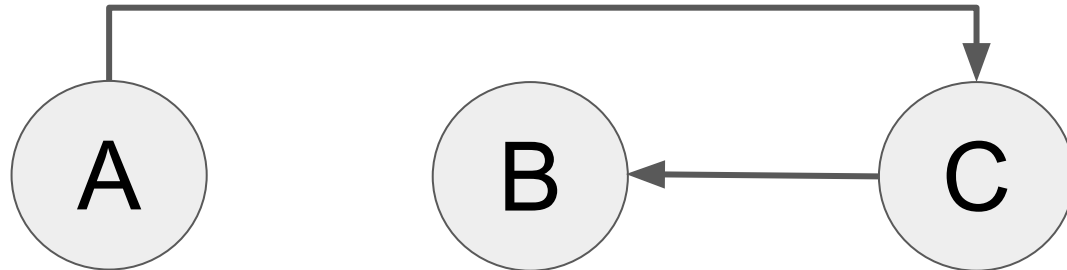
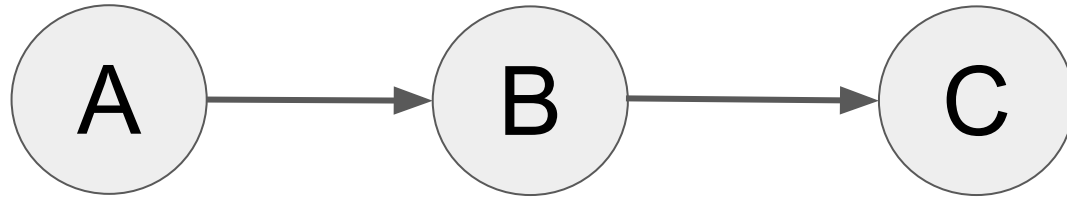


Forge
Timestamp



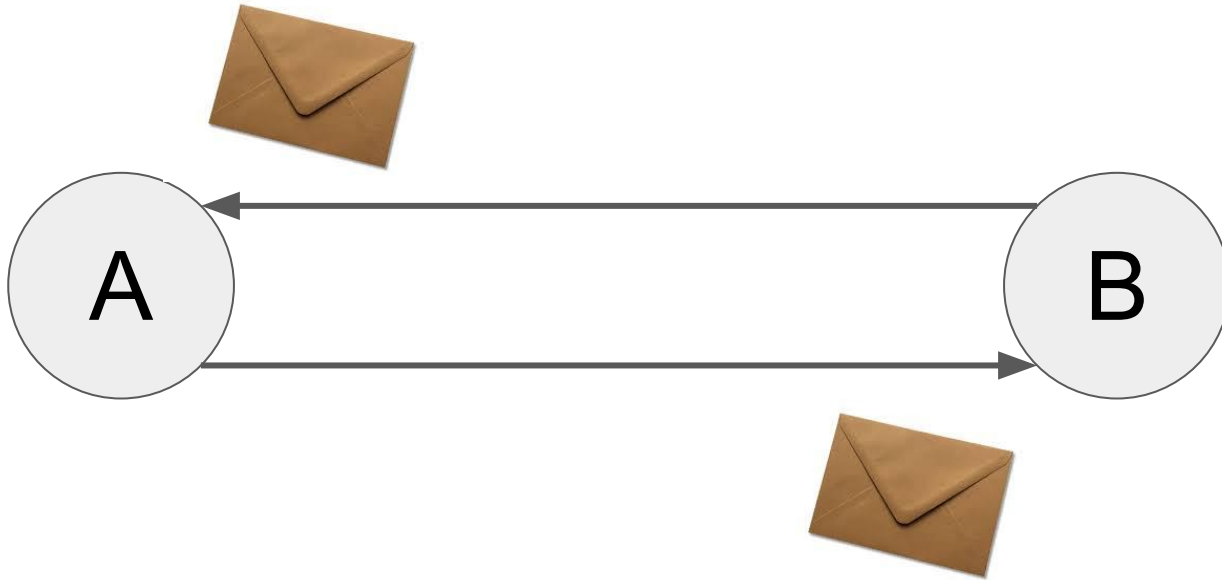
Location Theft

1. Which came first? Ordering Problem:

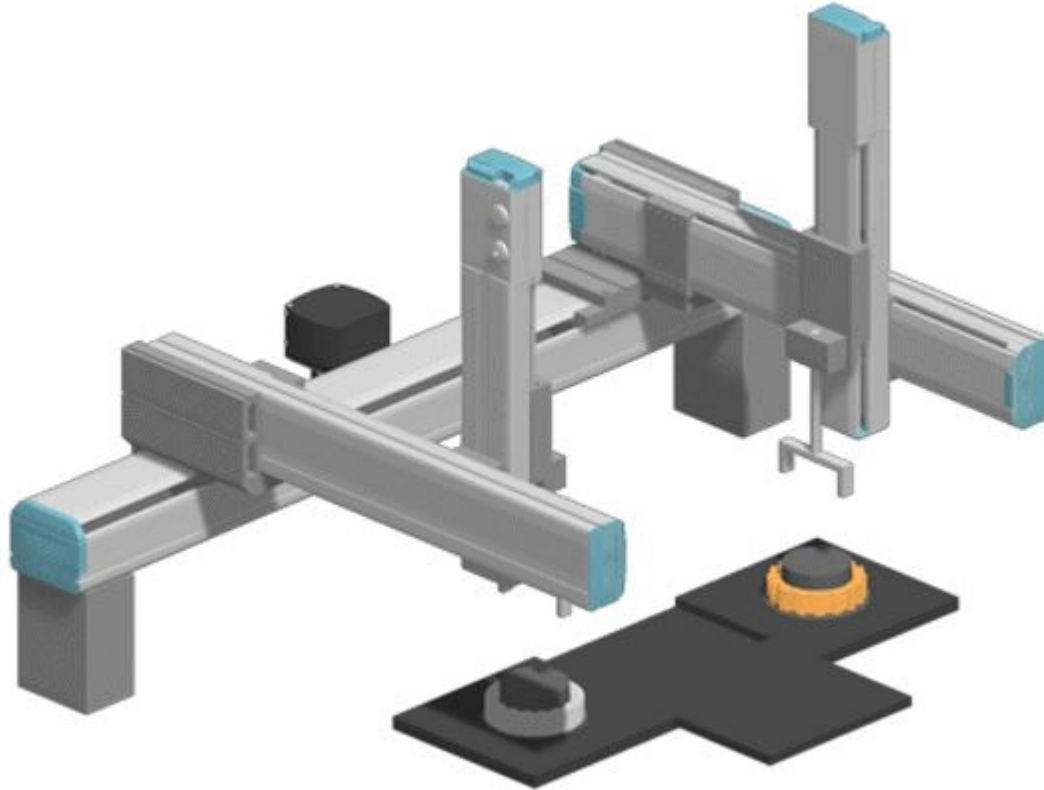


2. Is it Fresh?

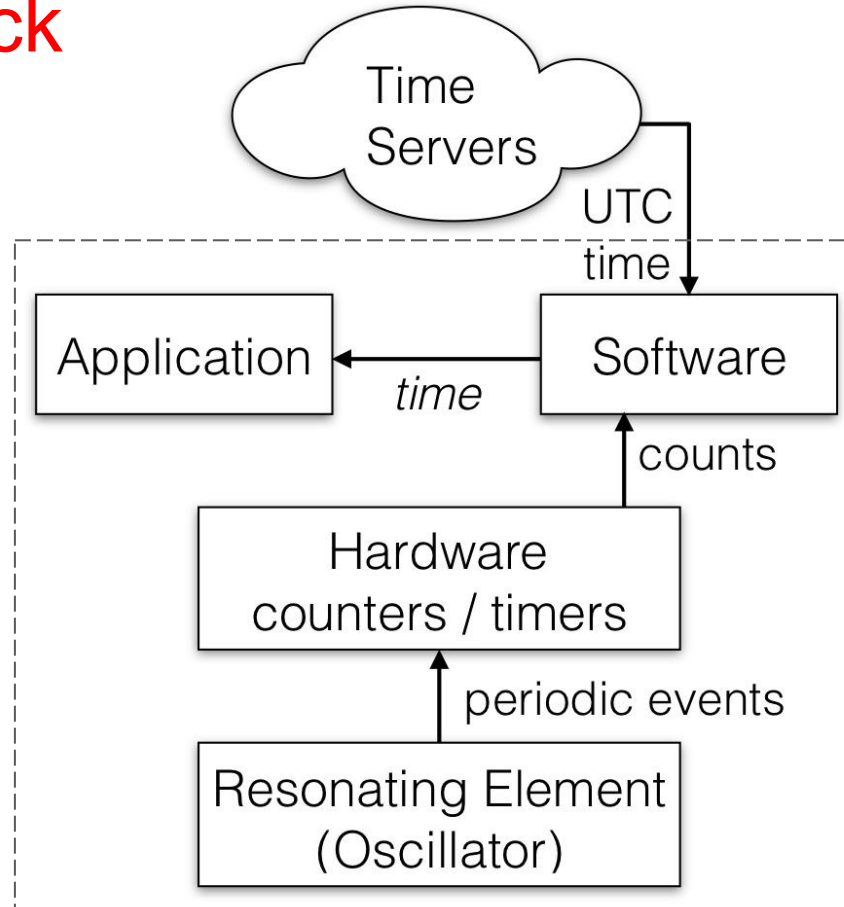
Timeliness Problem:



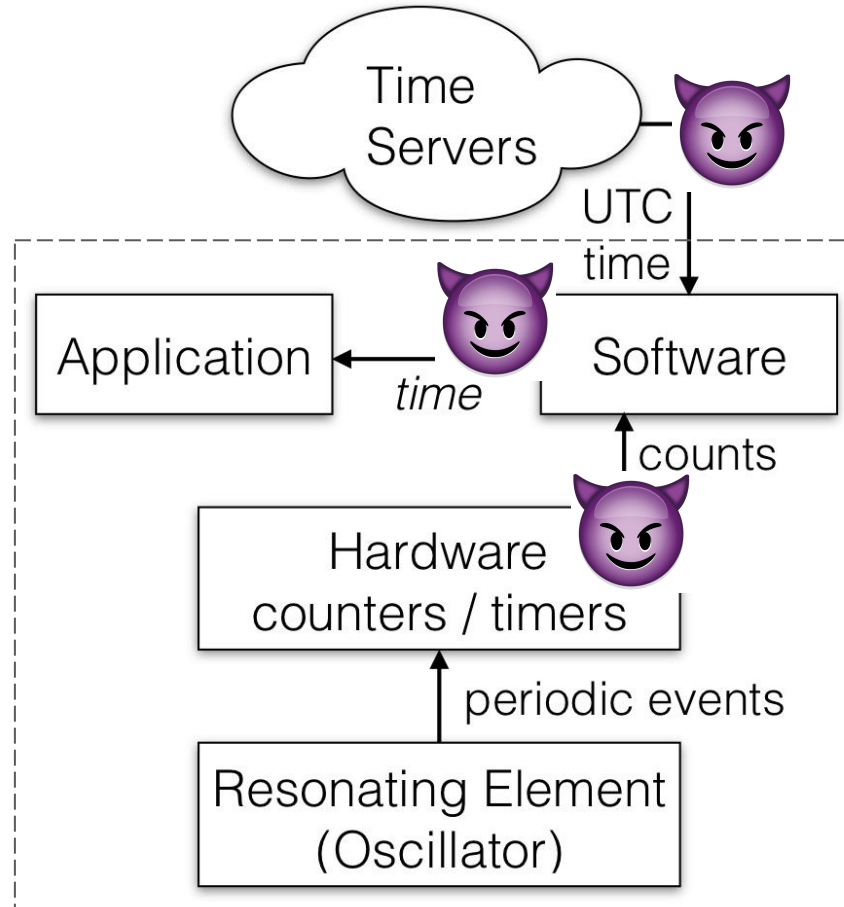
3. Is it Coordinated? Synchronization Problem:



Time Stack



Attacks



**Time Transfer
Attack**

**Time Integrity
Attack**



TimeSeal:

Secure time based primitives across all layers of a stack - hardware timers, software, and time packets

Do not assume “Clockless” systems

Do not take “Time” for granted



Location Theft

