Law, Science and Technology
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Incentivized Data Mules Based on State-Channels

InDaMul

General Problem $\rightarrow$ Possible Solution

People decides to move towards *countrysides and rural areas* -> it is not possible to implement (costly) smart city services.

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  - *novel opportunistic solutions* -> share and reuse data, services, computation.
  - **Data Mules** (Mobile Ubiquitous LAN Extensions) ->
    even in the absence of Internet are able to collect data from sensors and to exploit their own mobility to carry the information to destination

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- **State channel networks** -> participants pay by using other participants as relays.

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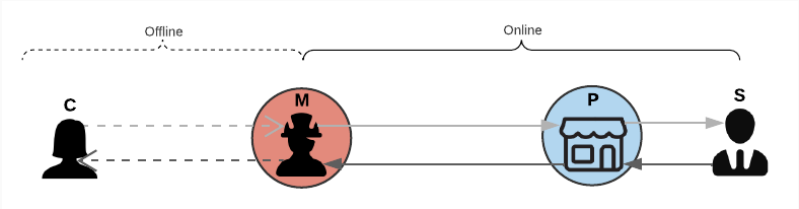

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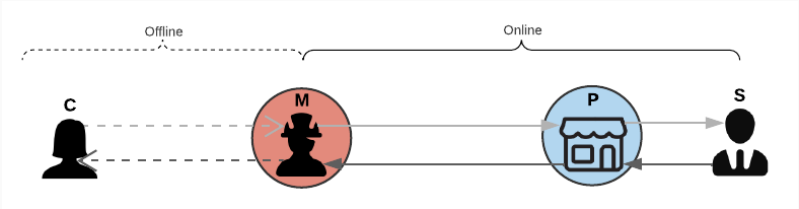

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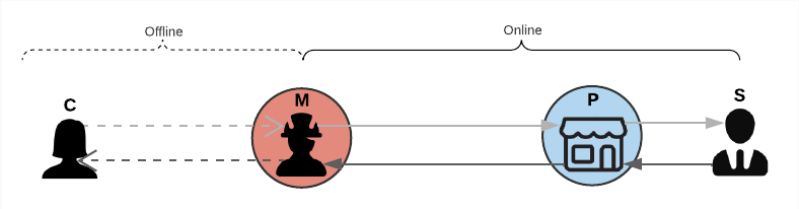

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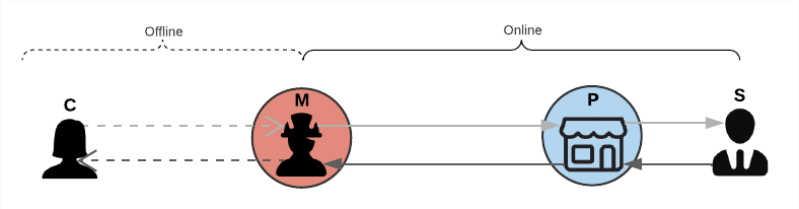

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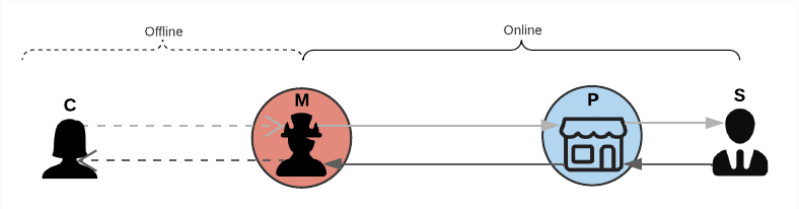

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- Then, a message can be returned from ***S*** to ***C*** in the opposite way.

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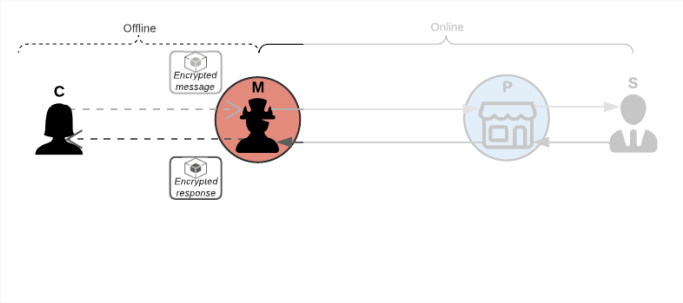

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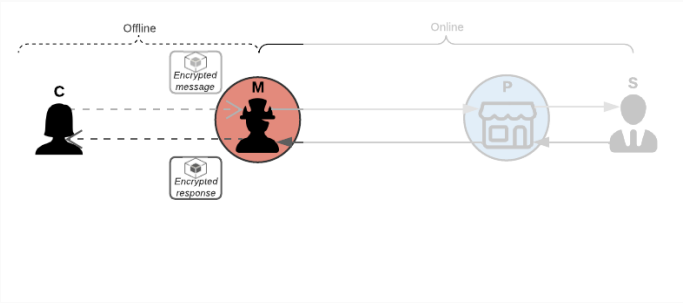

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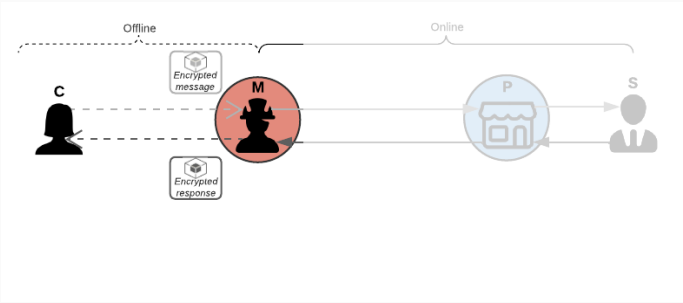

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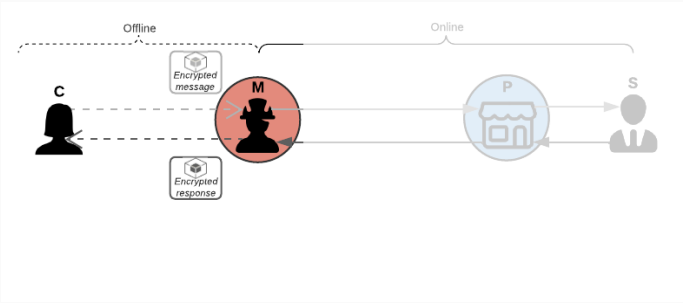

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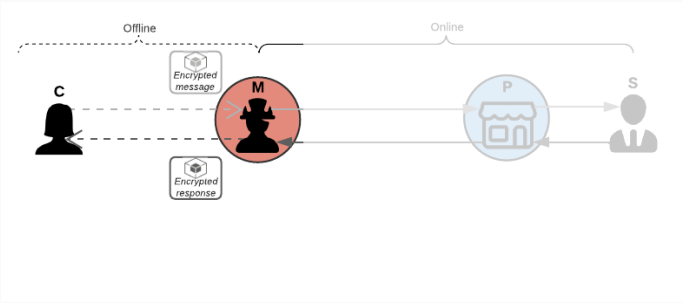

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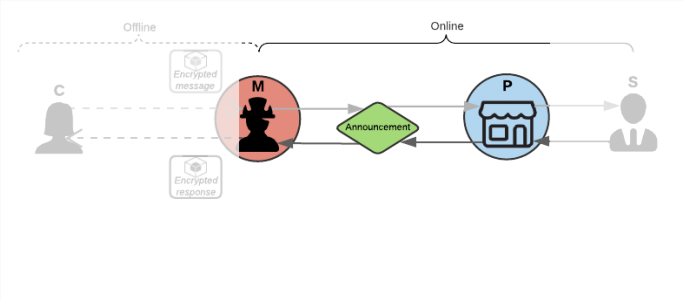
  - $tender_C$ containing: an immutable URI_p of p_C; *offer* to a P; id_x of the encryption key.

Mule to Proxy [1/3]



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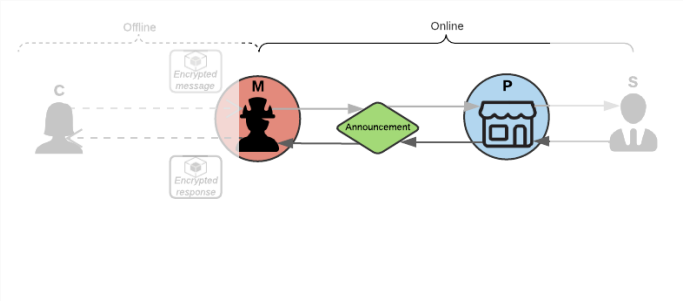

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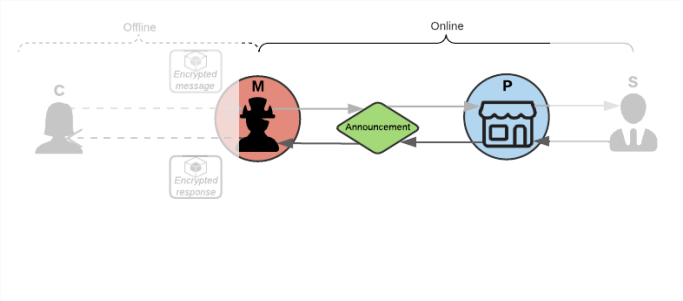

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- A Proxy **P**, which decides to take charge of p_C, downloads payload and *tender*.

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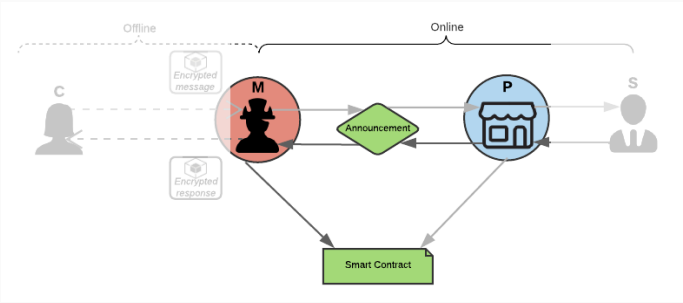

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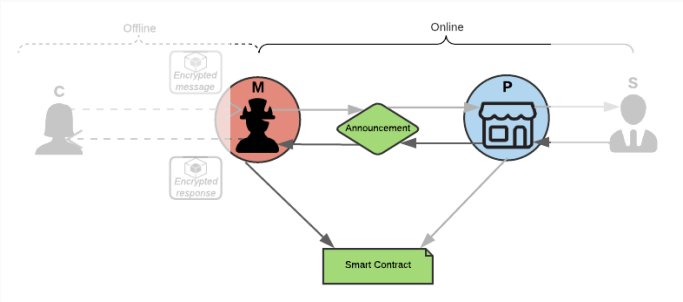

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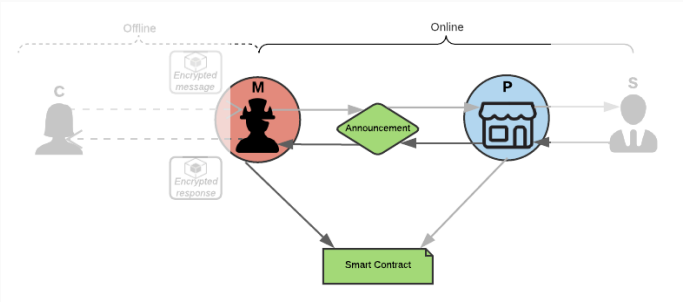

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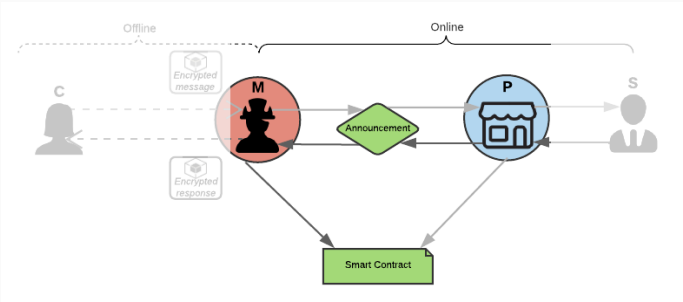

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- This makes **P** eligible to get access to the key identified by id_x.

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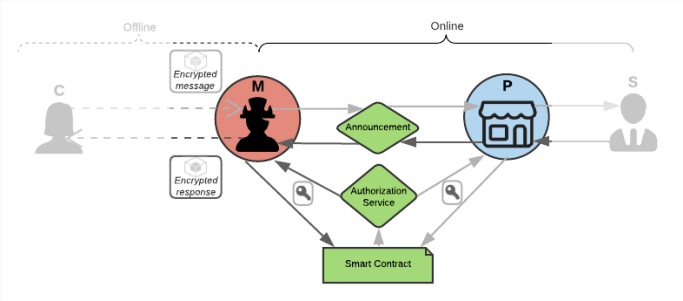

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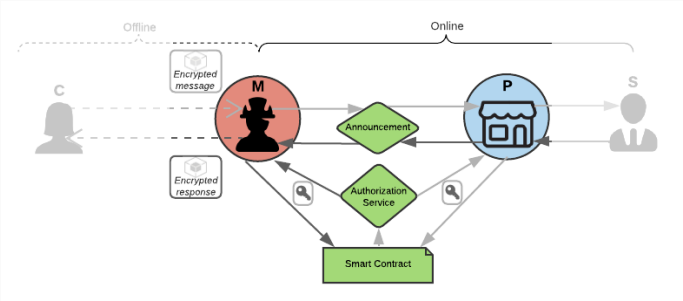

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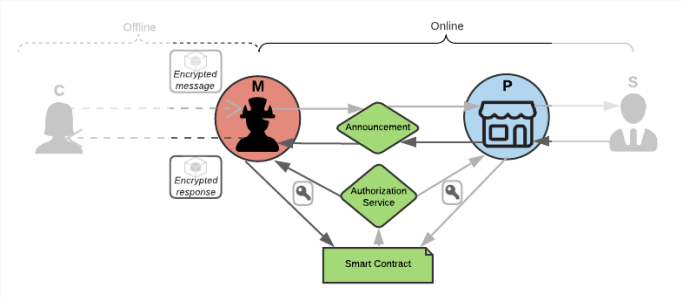

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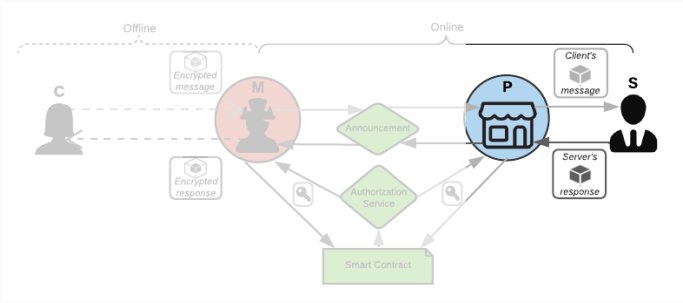

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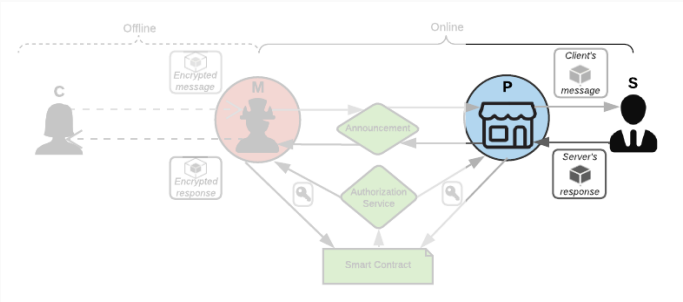

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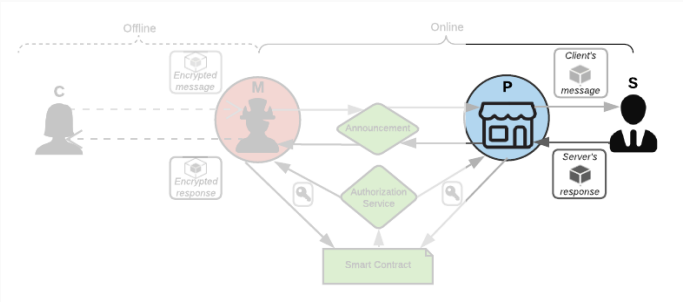

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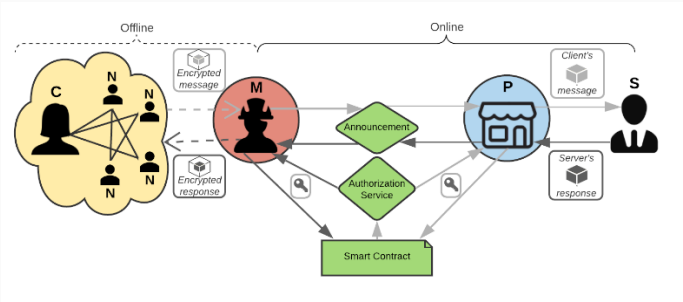

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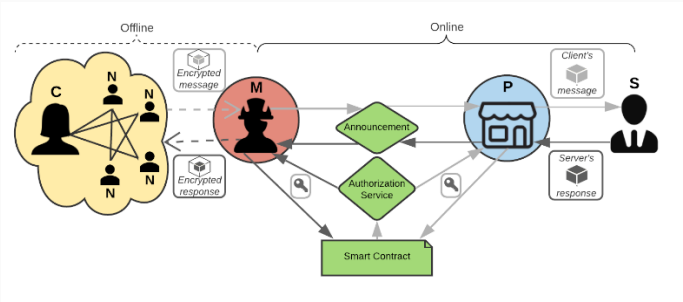

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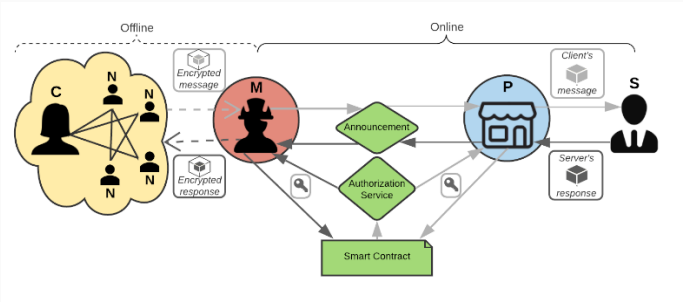

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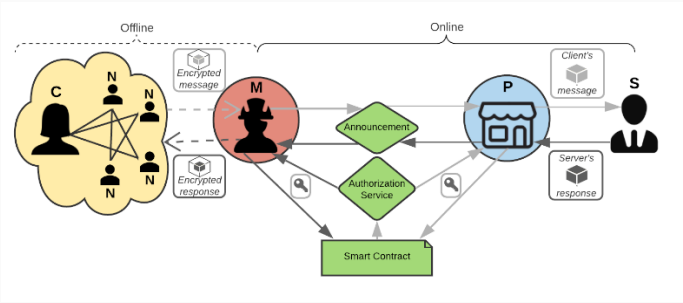

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- To incentivize Neighbors to relay messages a State Channel Network is used

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- Simulations performed with the **LUNES** agent-based simulator.