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## Eschewing the Cloud by leveraging Local Communication Channels

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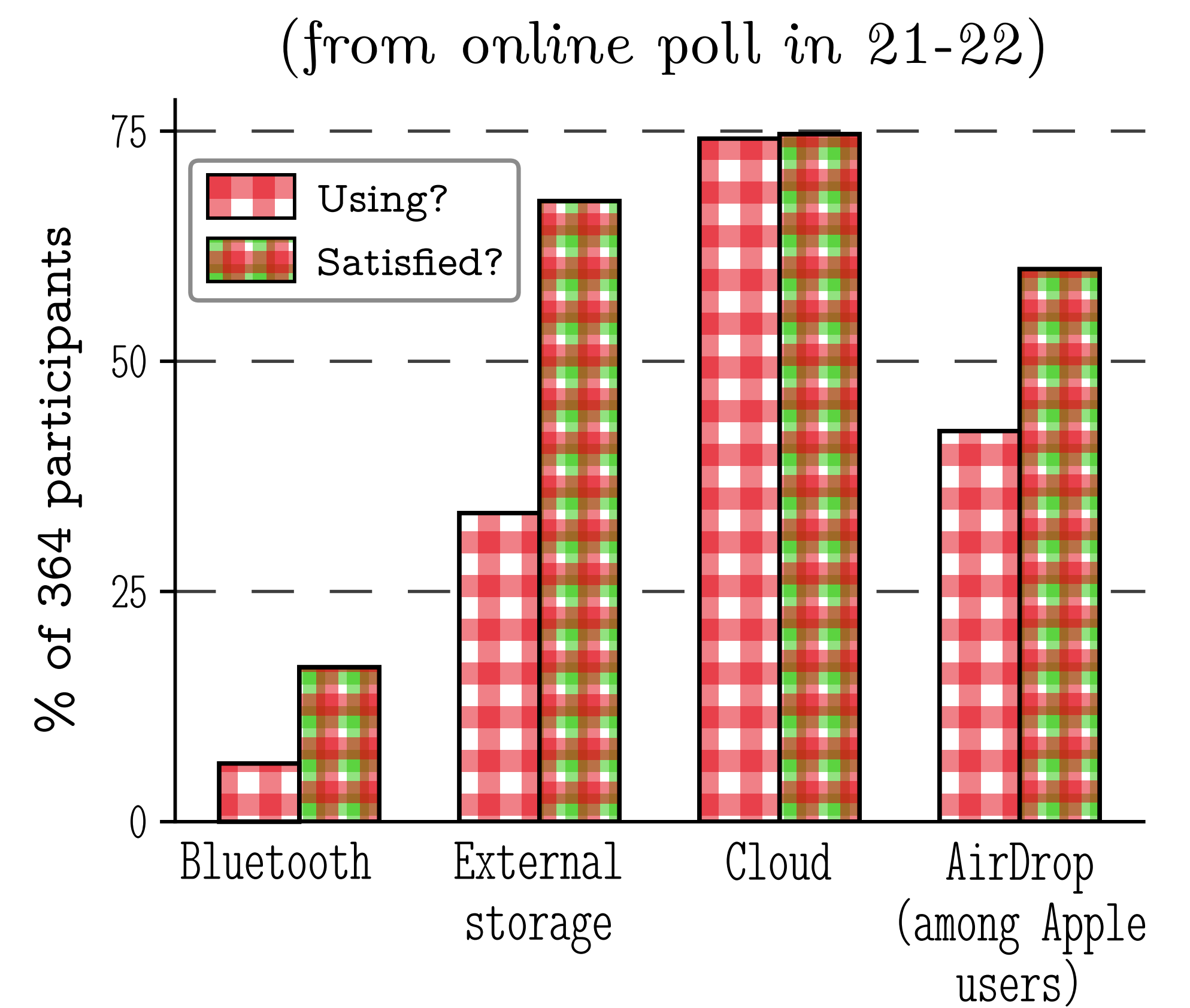
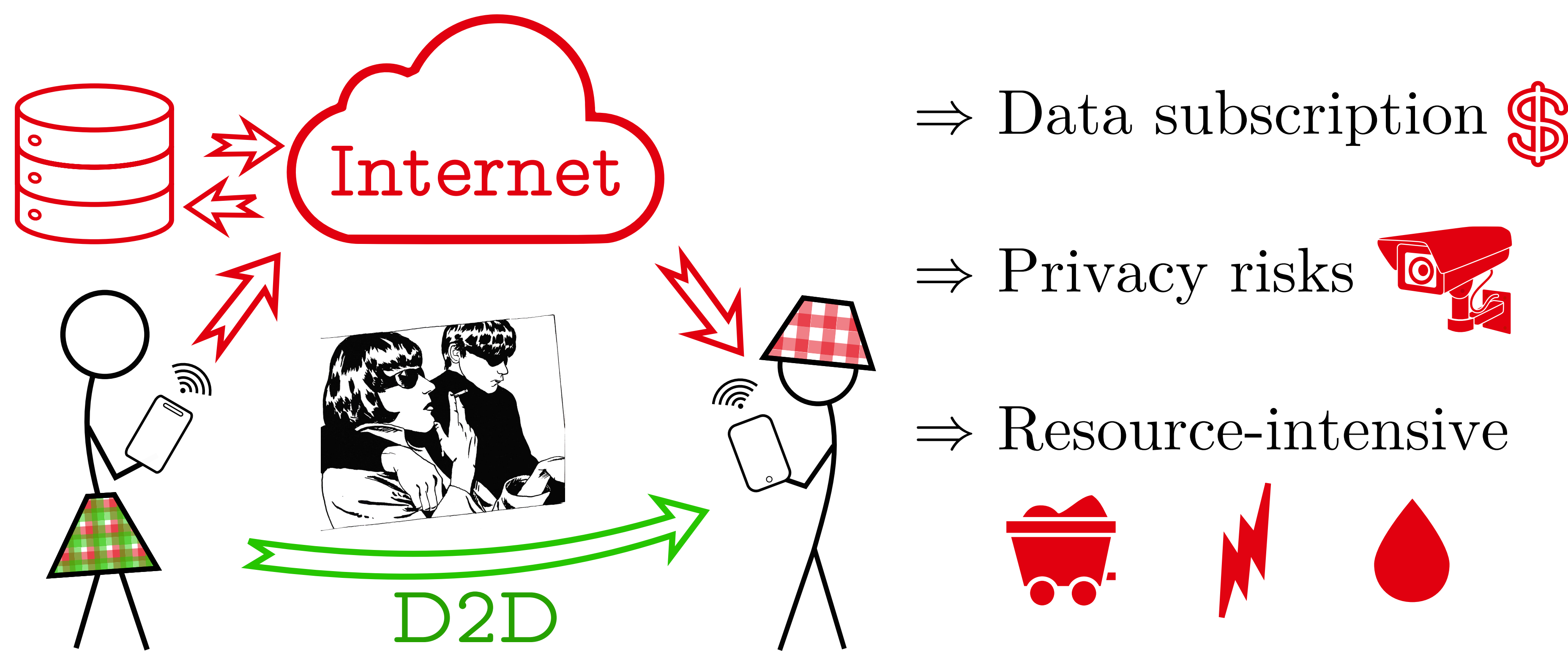
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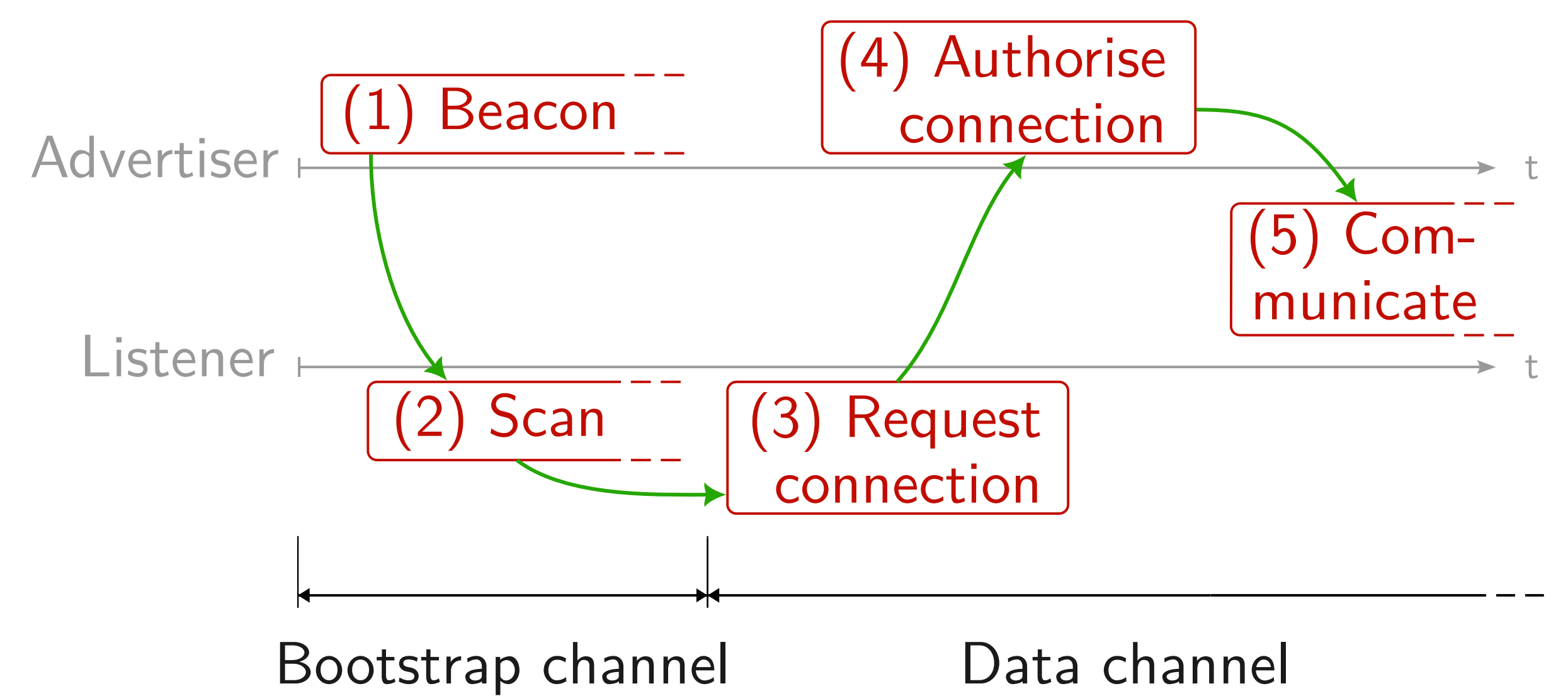
## Angus & Bob want to share cool things

Using the Net is costly but it "just works"



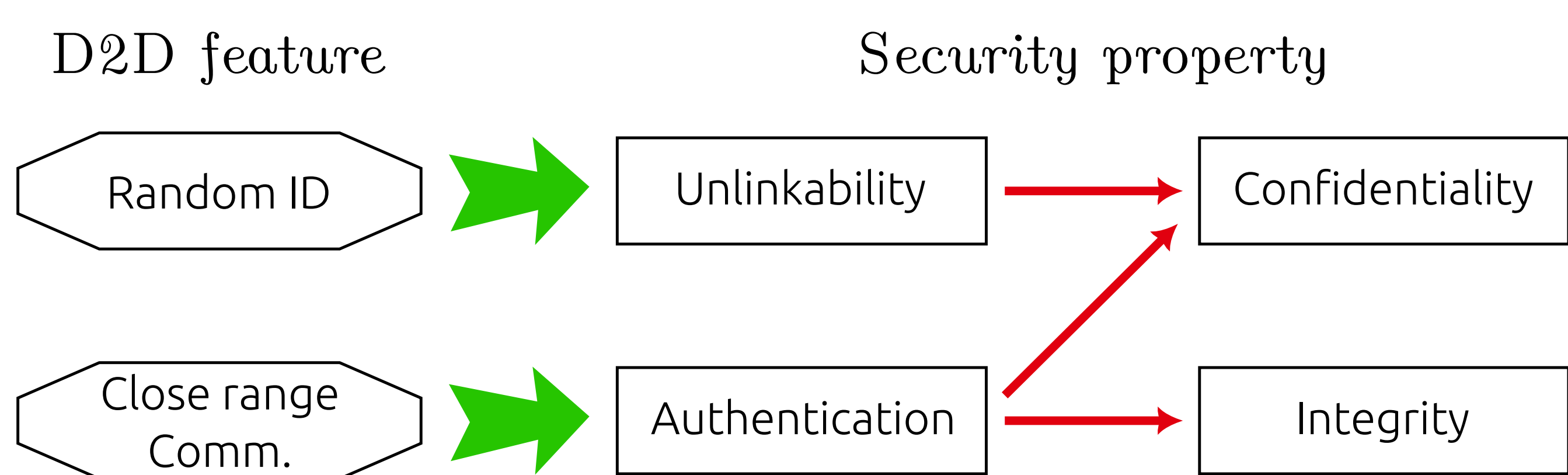
Why you no use **Device-to-Device (D2D)**?

D2D Channel	Inception	Max dist.	Max data rate	Frequency
<b>Optical</b>				
Infrared (IrDA)	1994	—	16 Mb/s	0.3-430 THz
QR-Code flashing	—	—	23.6 kb/picture	440-790 THz
<b>Wi-Fi</b>				
802.11 (legacy)	1997	100 m	1-2 Mb/s	2.4 GHz
802.11ax (Wi-Fi 6E)	2021	100 m	1.2 Gb/s	1-7.125 GHz
802.11ay	2021	10 m	100 Gb/s	60 GHz
<b>Bluetooth</b>				
Bluetooth Core v1	1999	100 m	1 Mb/s	2.4 GHz
Bluetooth Core v5	2016	100 m	1-3 Mb/s	2.4 GHz
<b>RFID</b>				
NFC	2004	20 cm	106-424 kb/s	13.56 MHz
<b>Ultra-WideBand</b>				
UWB	2007	200 m	27 Mb/s	3.1-10.6 GHz



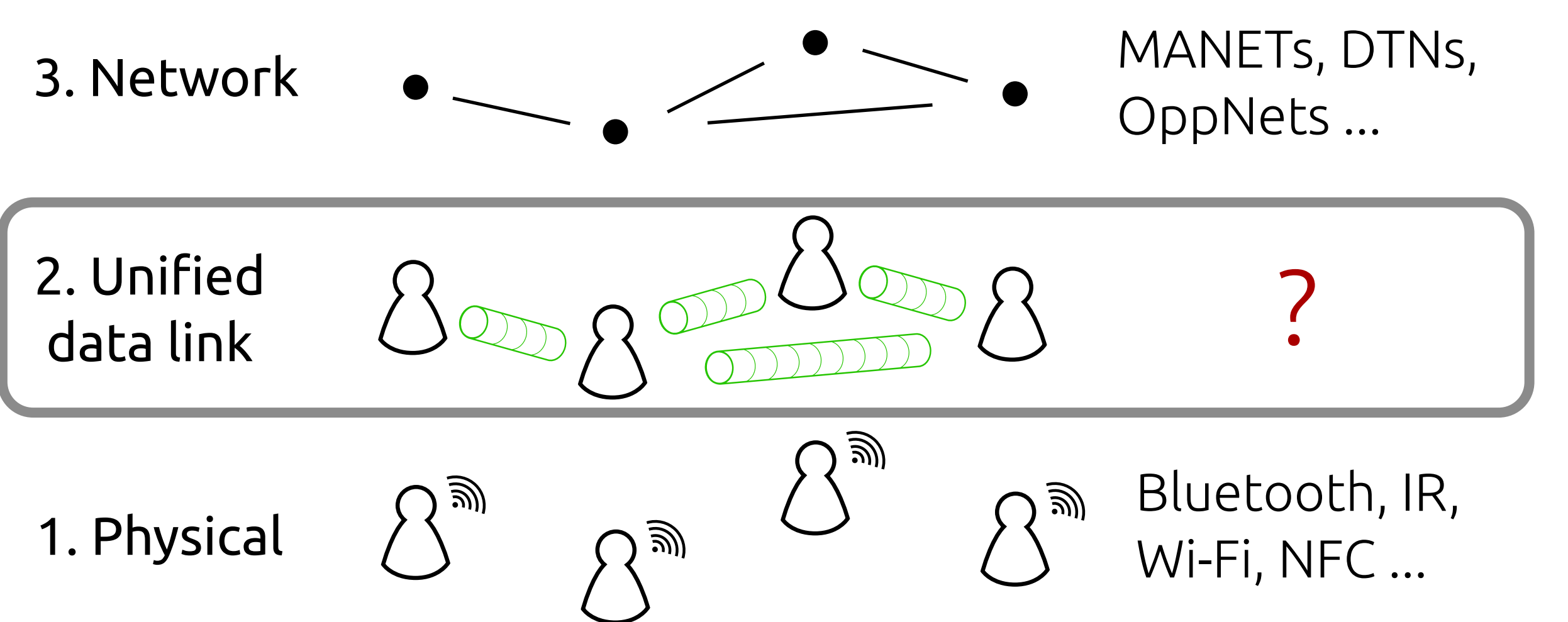
Channel type	Infrared	QRCode	Wi-Fi	Bluetooth	UWB	RFID
Bootstrap	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Many channels!



Cool security perks!

Fancy connection process!



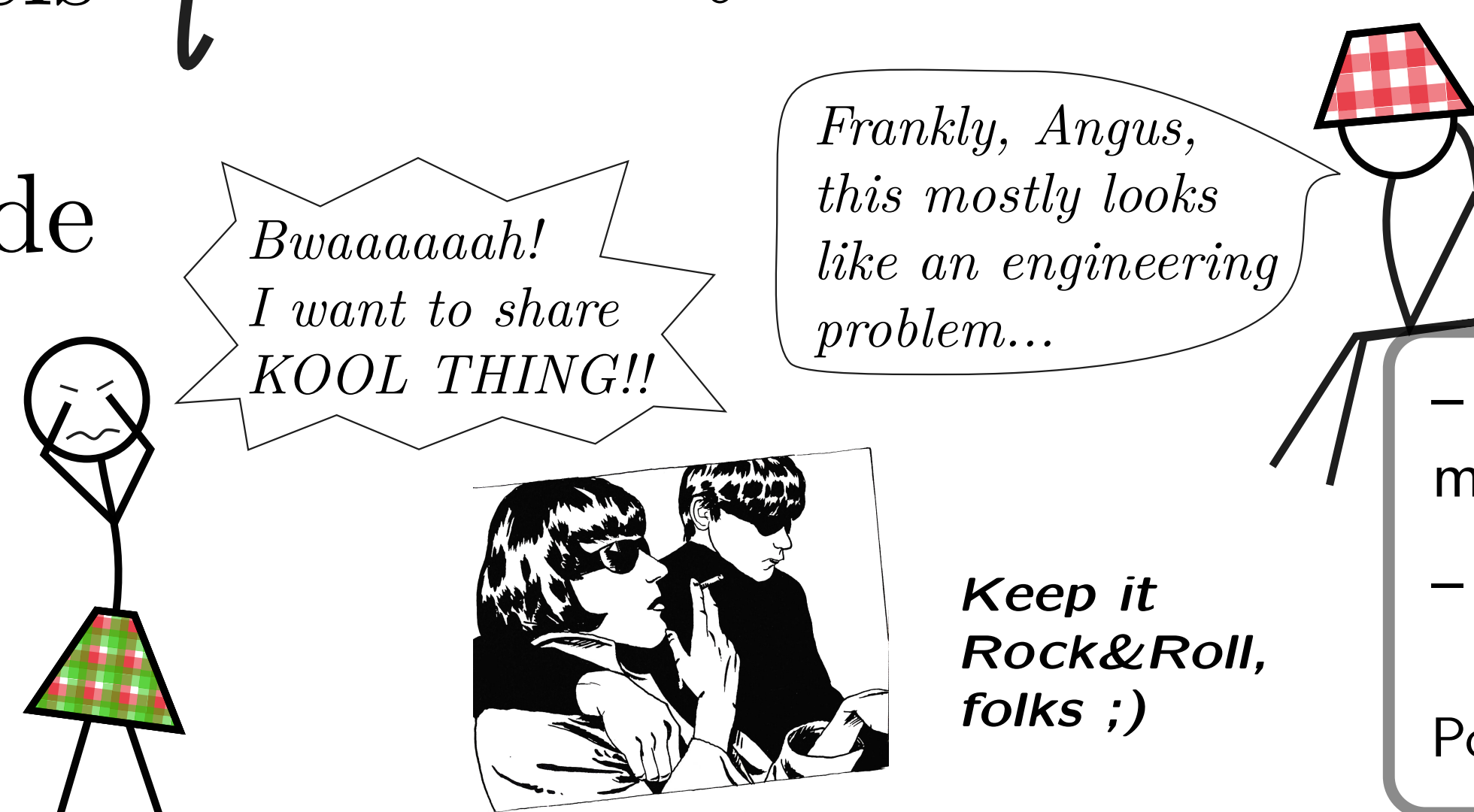
Only missing a data link layer...

Enters **VENICE framework!**

- Abstract bootstrap & data channels
- Implemented Wi-Fi, BT & QRCode
- Scheduler demo implementation
- Example mobile app (Flutter)

Main issue: **bad OS support**

- Poorly documented
- Locked in user-space
- Moving APIs



- Desauw et al., "A critical review of mobile D2D communication", 2023.  
- <https://github.com/orgs/Venice-D2D/>  
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