

LoraLight

LoRaWAN™ puts the big telco's first
We react



Ruud Vlaming

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github.com/devlaam

sourceforge.net/u/devlaam

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IoT and connected devices

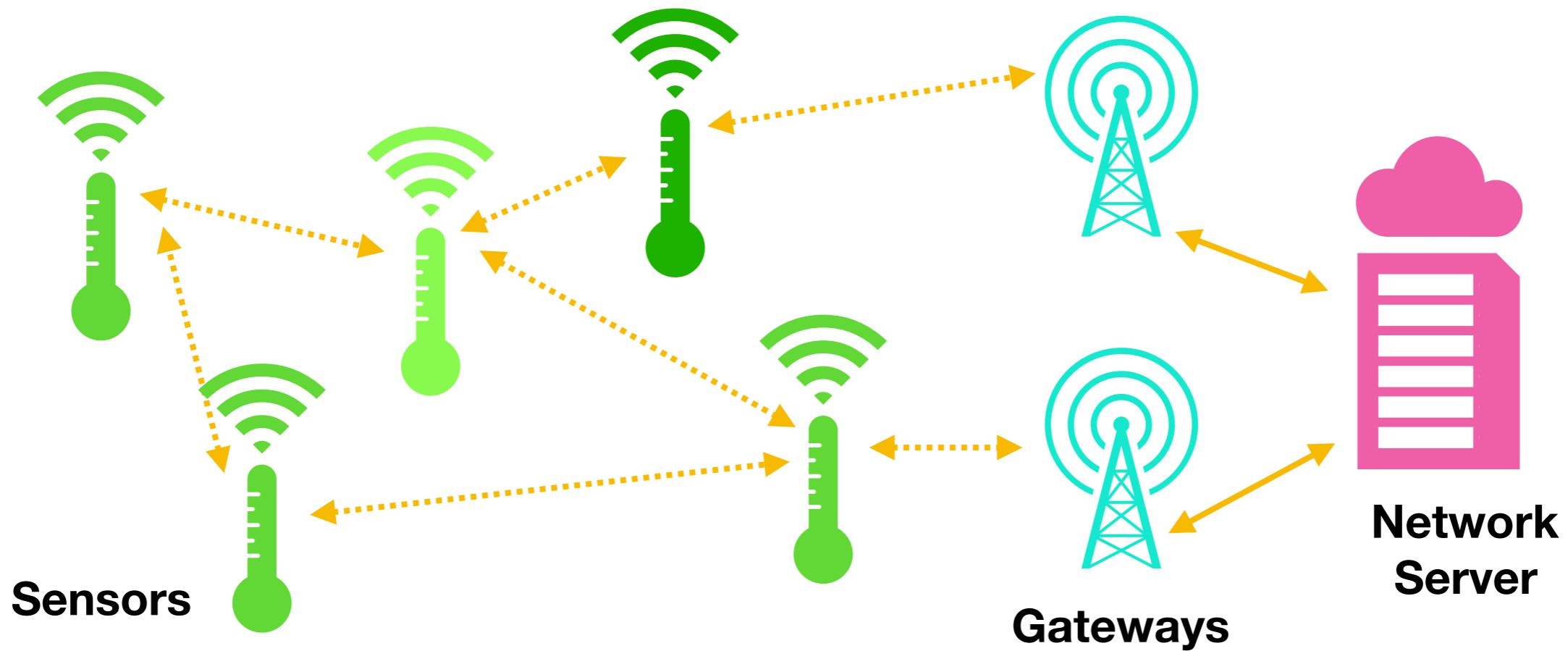
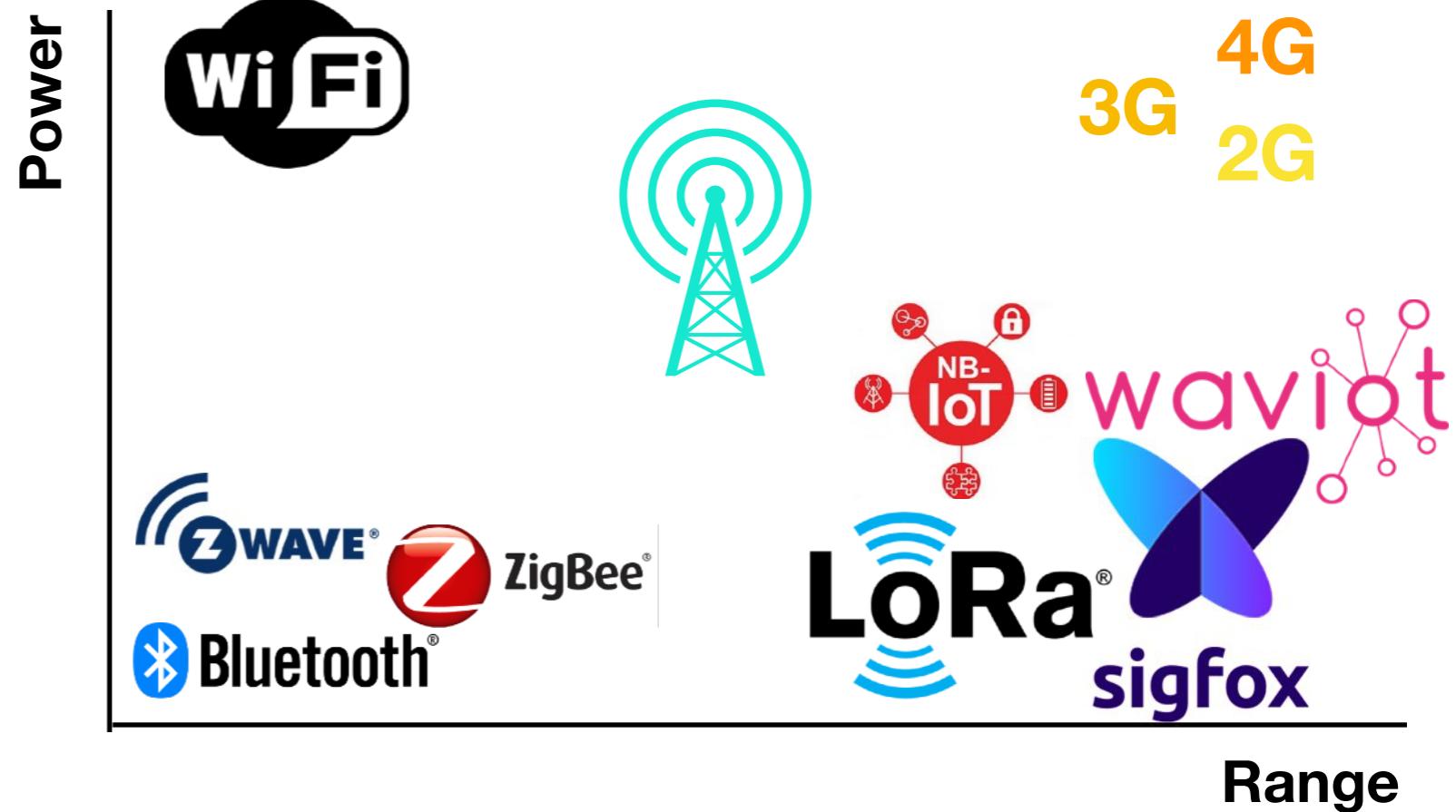
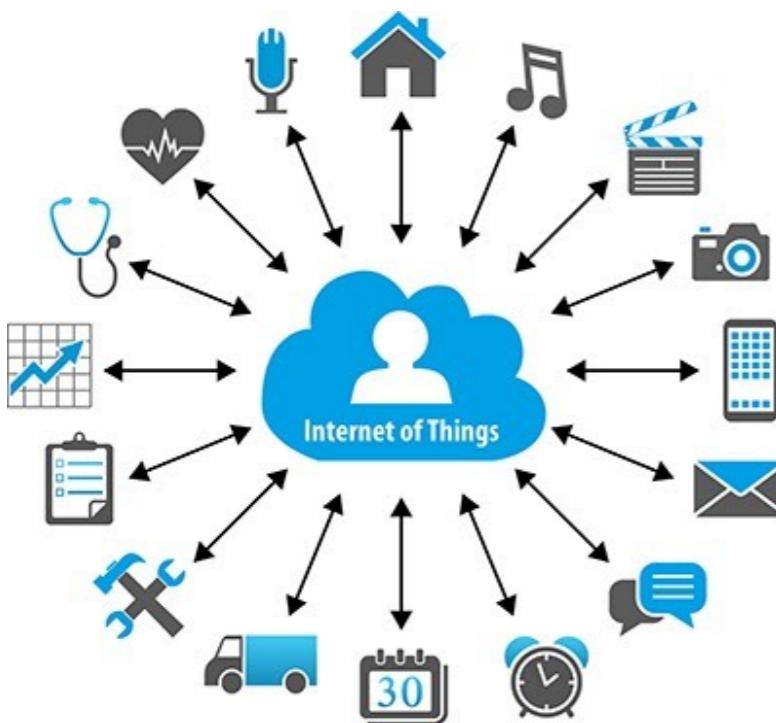
My (short) time with The Things Network.

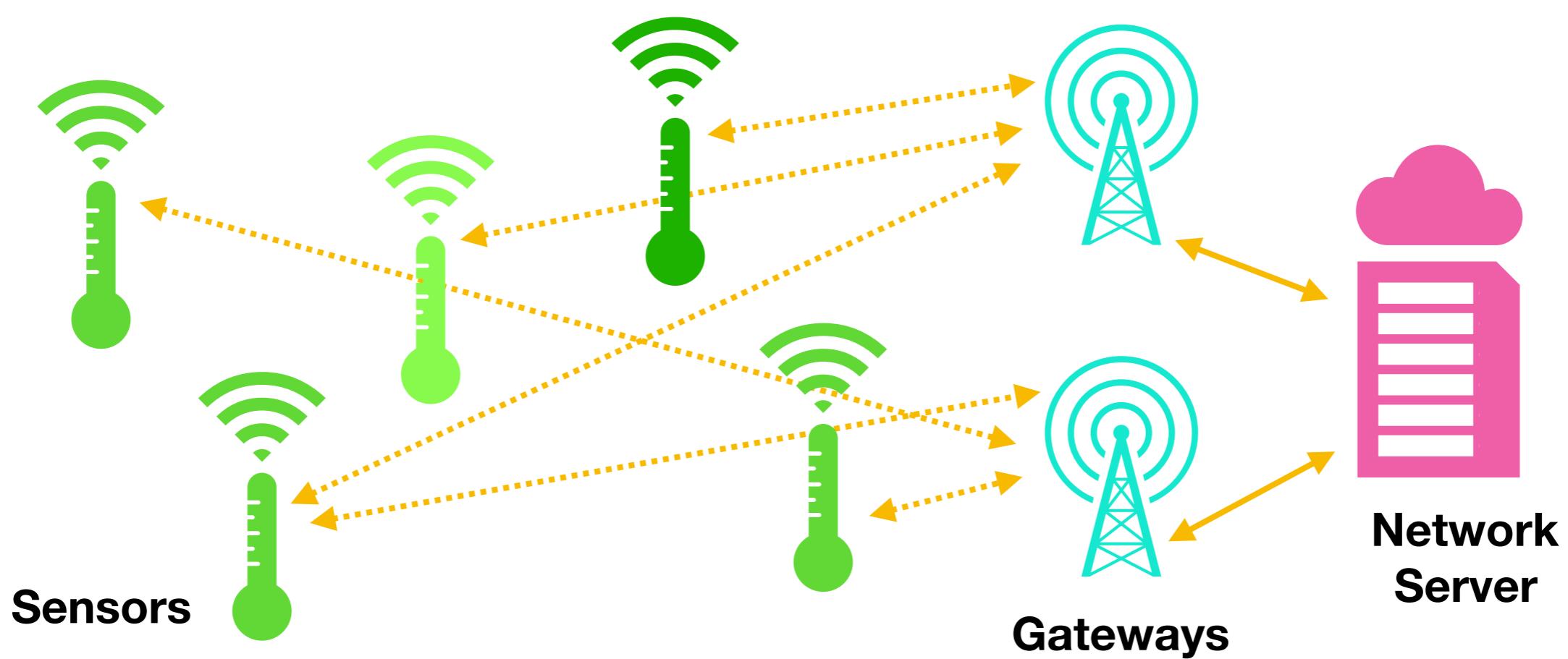
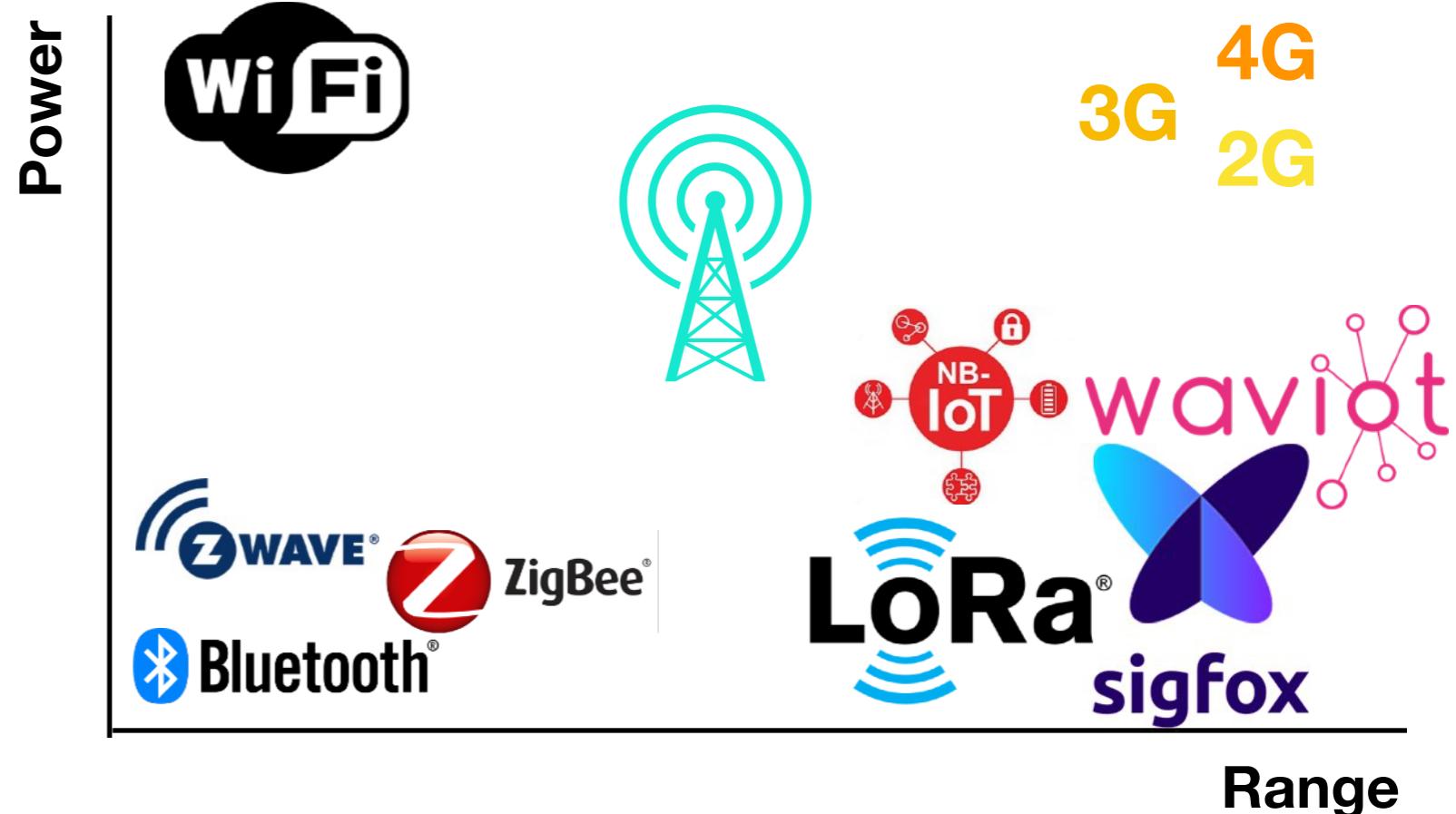
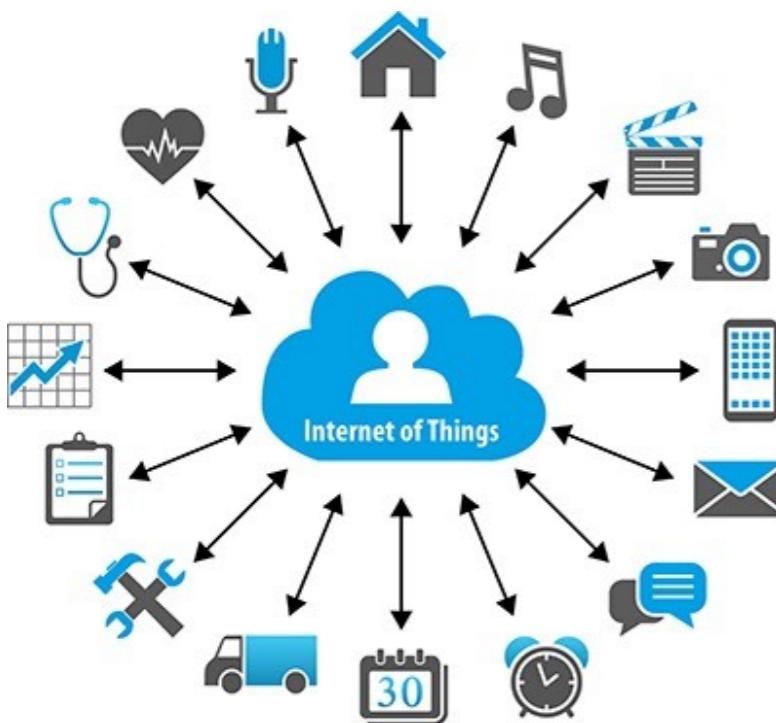
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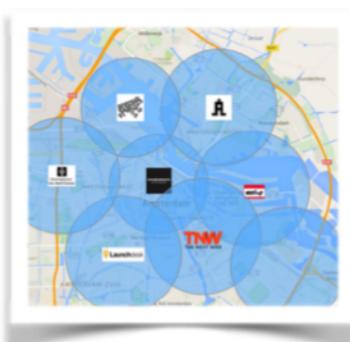
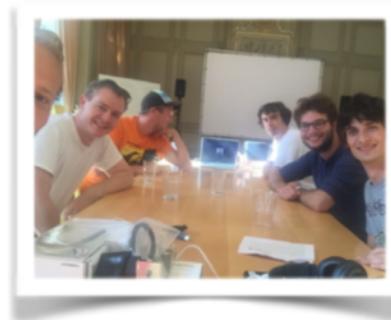


2015: We are on a mission to build a global open crowdsourced Internet of Things data network.





2015: We are on a mission to build a global open crowdsourced Internet of Things data network.



Kick off!

17-07-2015



Network Coverage
>10 contributors covering the city of Amsterdam

Initial Routing System
Make it work

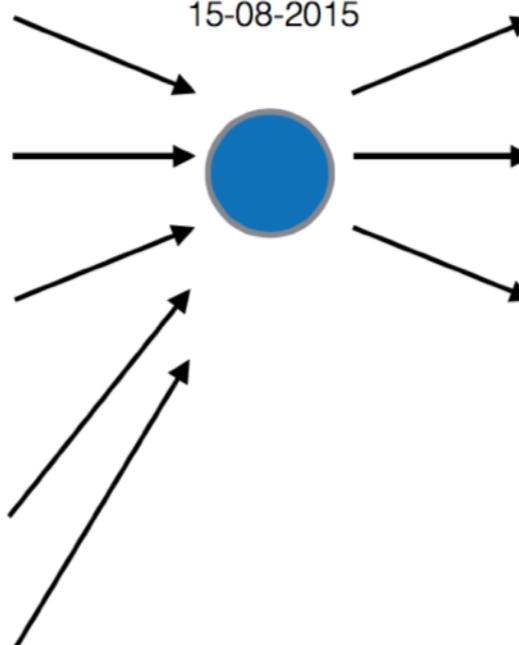
Initial Use Case
Water in Boat detector

Plan for a \$200 gateway
For the story

A kick ass press release

Live in Amsterdam

15-08-2015



Affordable Gateway (Plug and Play)

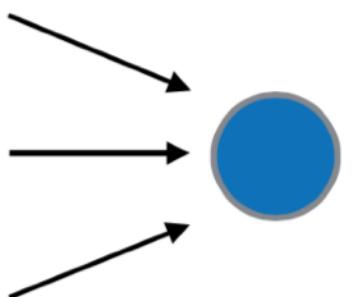
Security and Legislation

Scalable Crowd sourcing Campaign

Routing 100% aligned with Manifesto

World Wide Coverage

15-08-2016





2015: We are on a mission to build a global open crowdsourced Internet of Things data network.

zaterdag 22 augustus De Telegraaf - 2015

Amsterdam van start met nieuw digitaal netwerk

Superinternet als afstandsbediening

INTERNET DER DINGEN
Het LoRa-netwerk verbindt alledaagse apparaten met het web.

Siem

I Blankenstein
Je kijkt er uit naar het veelgebruikte internet of things? Weinig mensen sluiten hun televisie op internet aan. De op internet aangesloten koelkast, het standaardtien jaar geleden, zoog hooguit tien. Tegenwoordig hebben we onder een smartphone en hebben we's standaard een mobiele vermet een app bestuurbare huurernettelethermostaten van 't worden echter verkocht. 'topen soepel online te krijgen. Een aantal mensen hebben een satellietvering voor bijvoorbeeld een huis. Zo zou je eenvoudig kunnen oppoelen. Maar 'sor in de handel een 'tument moeten zitten 'veel baasjes te duur mettenende dingen'

Komt het 'internet der dingen' nu een stap dichterbij?



The Things Network
Amsterdam heeft een nieuw gratis straatnetwerk, straatnetwerk van een...

key4biz
dal 2002

Crowdfunding

The Things Network will jede Stadt smart machen

The Things Network ist eine Erfindung des Niederländischen Unternehmers Wienke Giezeman. Es ist eine offenes Netzwerk, dass über die LoRaWAN Technologie läuft und in Amsterdam das erste Mal getestet wurde.

von Vera Bauer am 22. August 2015

E-Mail [@vera_bauer](#) [Vera Bauer](#)

[Facebook](#) [Twitter](#) [Google+](#) [Pocket](#) [WhatsApp](#) [1 Kommentar](#)

Vielelleicht passt diese News gerade, weil ich momentan selber in den Niederlanden Urlaub mache. Auf jeden Fall, hat mich das Konzept von The Things Network fasziniert, und Amsterdam wird somit die erste smarte Stadt sein. Es ist eine neue Einführung in das Internet der Dinge und im Prinzip ist es ein Wireless-Netzwerk, das einem ermöglicht das Internet ohne 3G oder WiFi zu nutzen.



MOBILE GEEKS

tweakers

sprout
INSPIREERT ONDERNEMERS

rtlnieuws



The internet just turned 25. This is a big moment, but we're only getting started. After putting a super computer in everyone's pocket, things around us will be connected to the internet as well! And machines will be able to interact with the physical world in a whole new way. Machines will be...



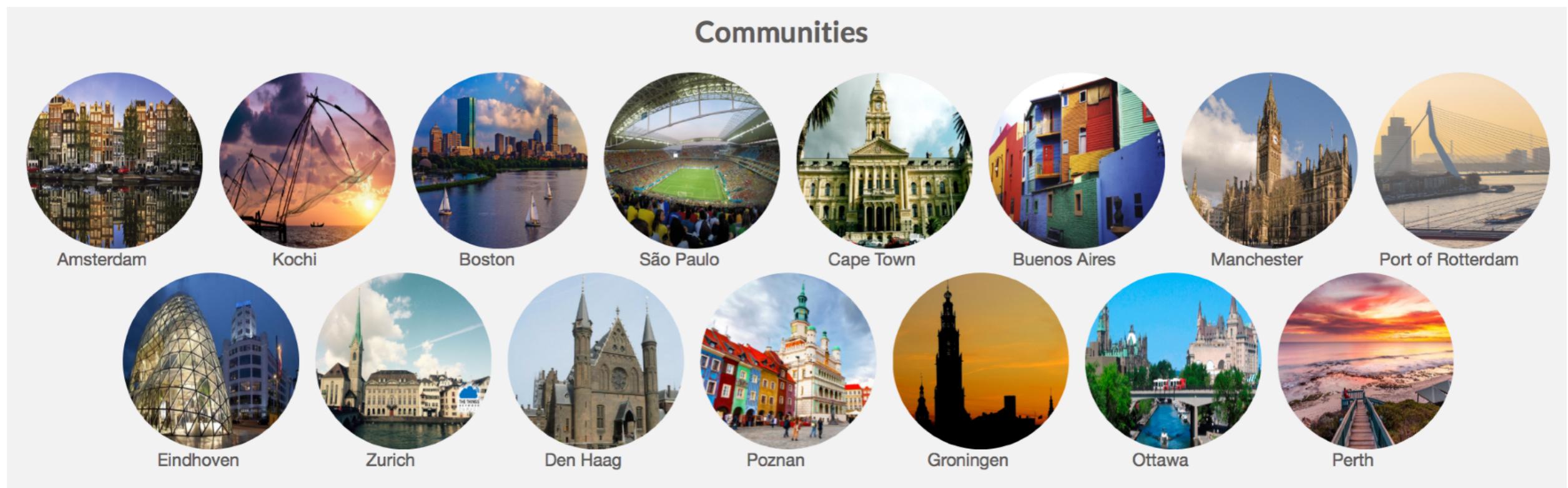
Het PAROOL
Duidelijk Amsterdams

10M People reached

The Things Network



2015: We are on a mission to build a global open crowdsourced Internet of Things data network.



The Things Network Manifesto (2015)

Everything that carries power will be connected to Internet eventually. Controlling the network that makes this possible means controlling the world. We believe that this power should not be restricted to a few people, companies or nations. Instead this should be distributed over as many people as possible without the possibility to be taken away by anyone. We therefore founded "The Things Network"

The Things Network is an open source, free initiative with the following properties:

- It connects sensors and actuators, called "Things", with transceivers called "Things Gateways" to servers called "Things Access". The first connection is "Over The Air" the second is "Over The Net". The distributed implementation of these concepts is called "The Things Network".
- Anyone shall be free to set up "Things" and connect to "Things Gateways" that may or may not be their own.
- Anyone shall be free to set up "Things Gateways" and connect to "Things Access" that may or may not be their own. Their "Things Gateways" will give access to all "Things" in a net neutral manner, limited by the maximum available capacity alone.
- Anyone shall be free to set up "Things Access" and allow anonymous connections from the Internet. Their "Things Access" will give access to all "Things Gateways" in a net neutral manner, limited by the maximum available capacity alone. Furthermore their "Things Access" will allow connection of other "Things Access" servers for the distribution of data.
- The "Over The Air" and "Over The Net" networks shall be protocol agnostic, as long as these protocols are not proprietorial, open source and free of rights.
- Anyone who perpetrates a "Things Access" or a "Things Gateway" will do so free of charge for all connecting devices and servers.
- Anyone making use of the network is allowed to do so for any reason or cause, possibly limited by local law, fully at own risk and realizing that services are provided "as is" and may be terminated for any reason at any moment. The use may be open for anybody, limited to customers, commercial, not-for-profit, or in any other fashion. "The Things Network" providers will not pose restrictions upon its users.

We invite you to sign this Manifesto, and uphold its principles to the best of your abilities.

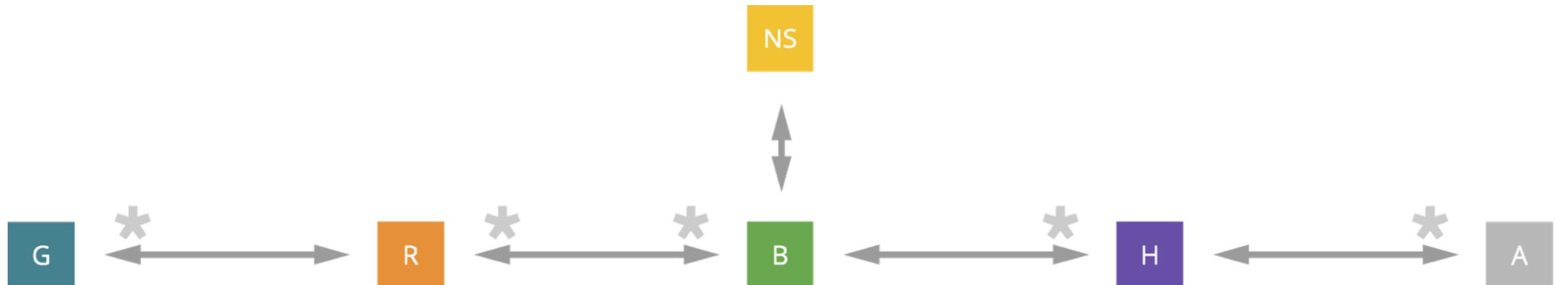
<https://github.com/devlaam/Manifest>

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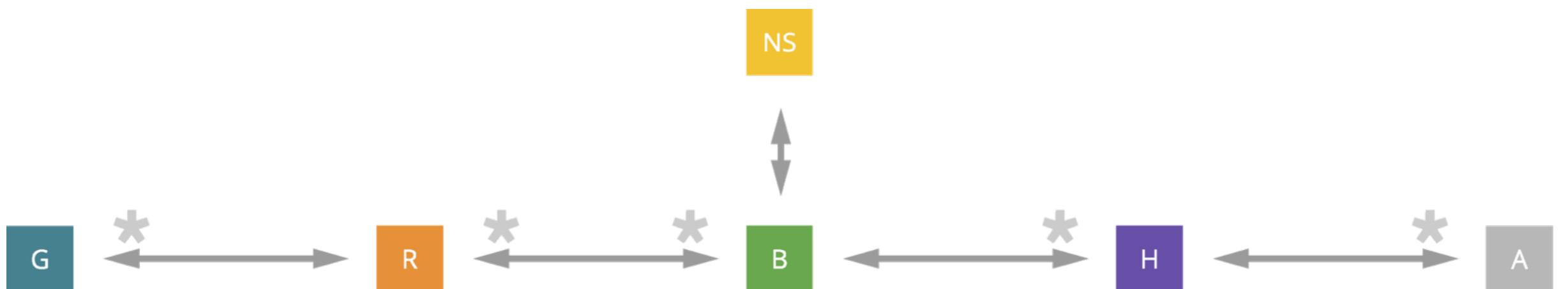
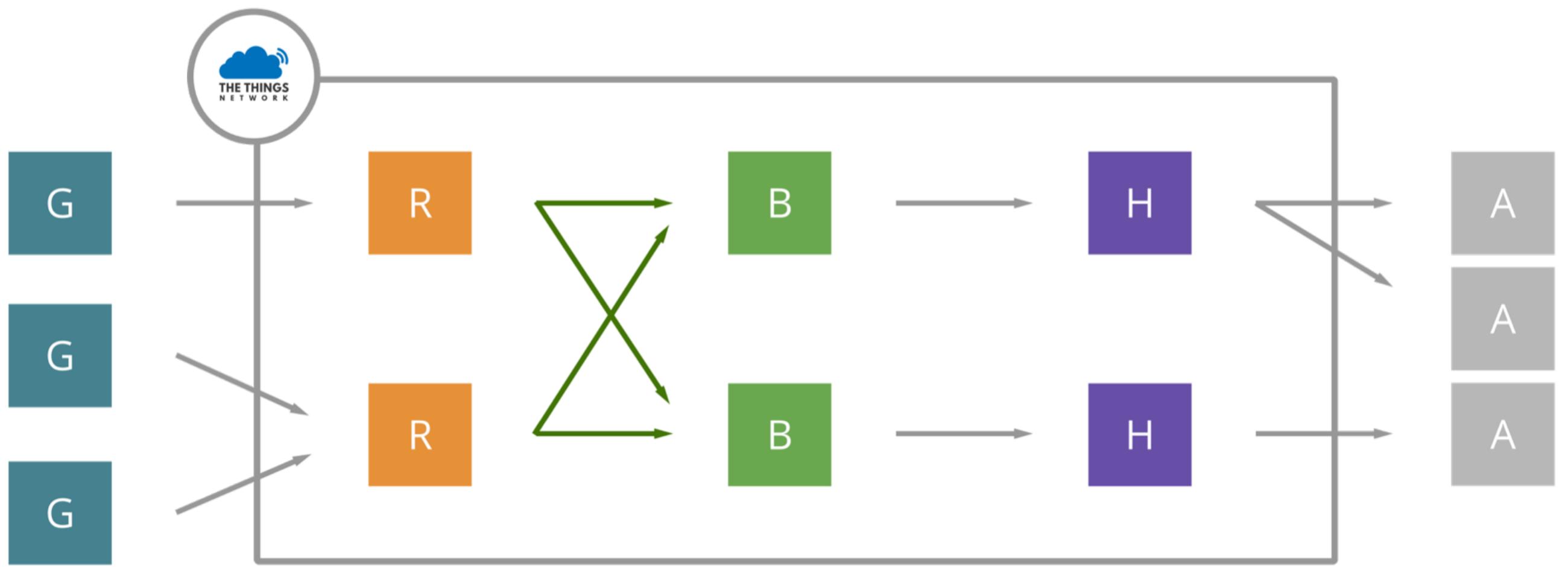
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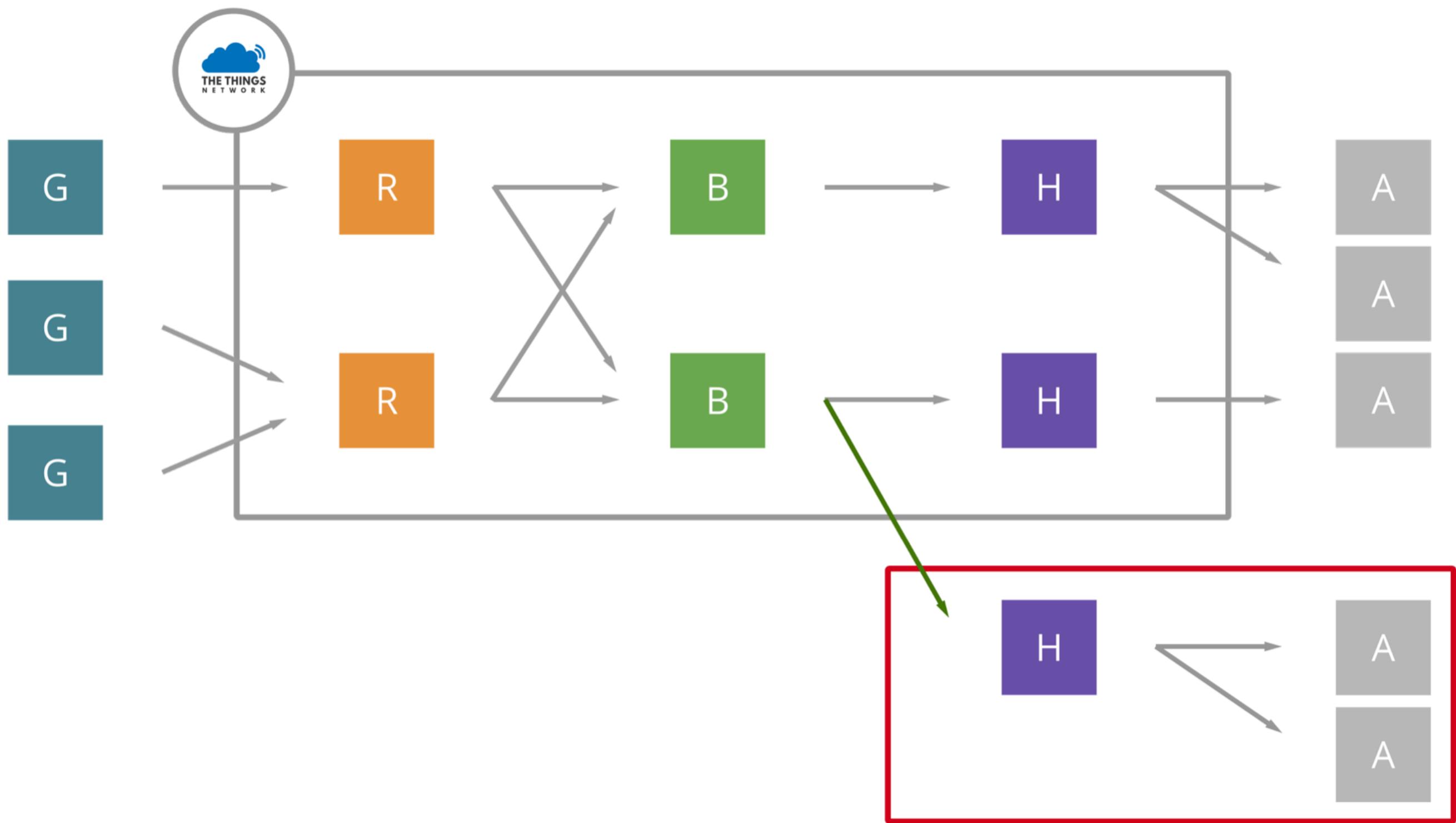
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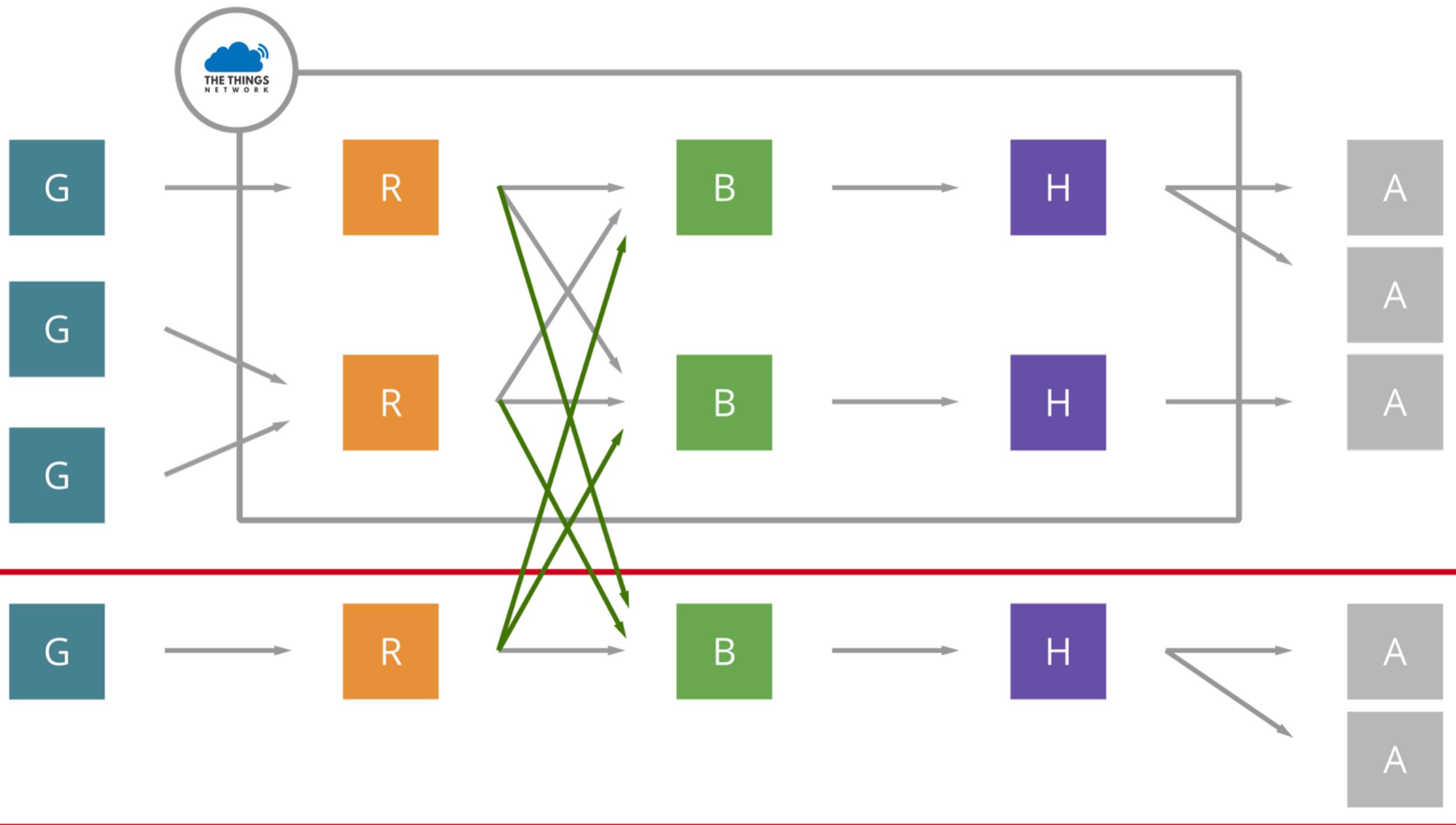


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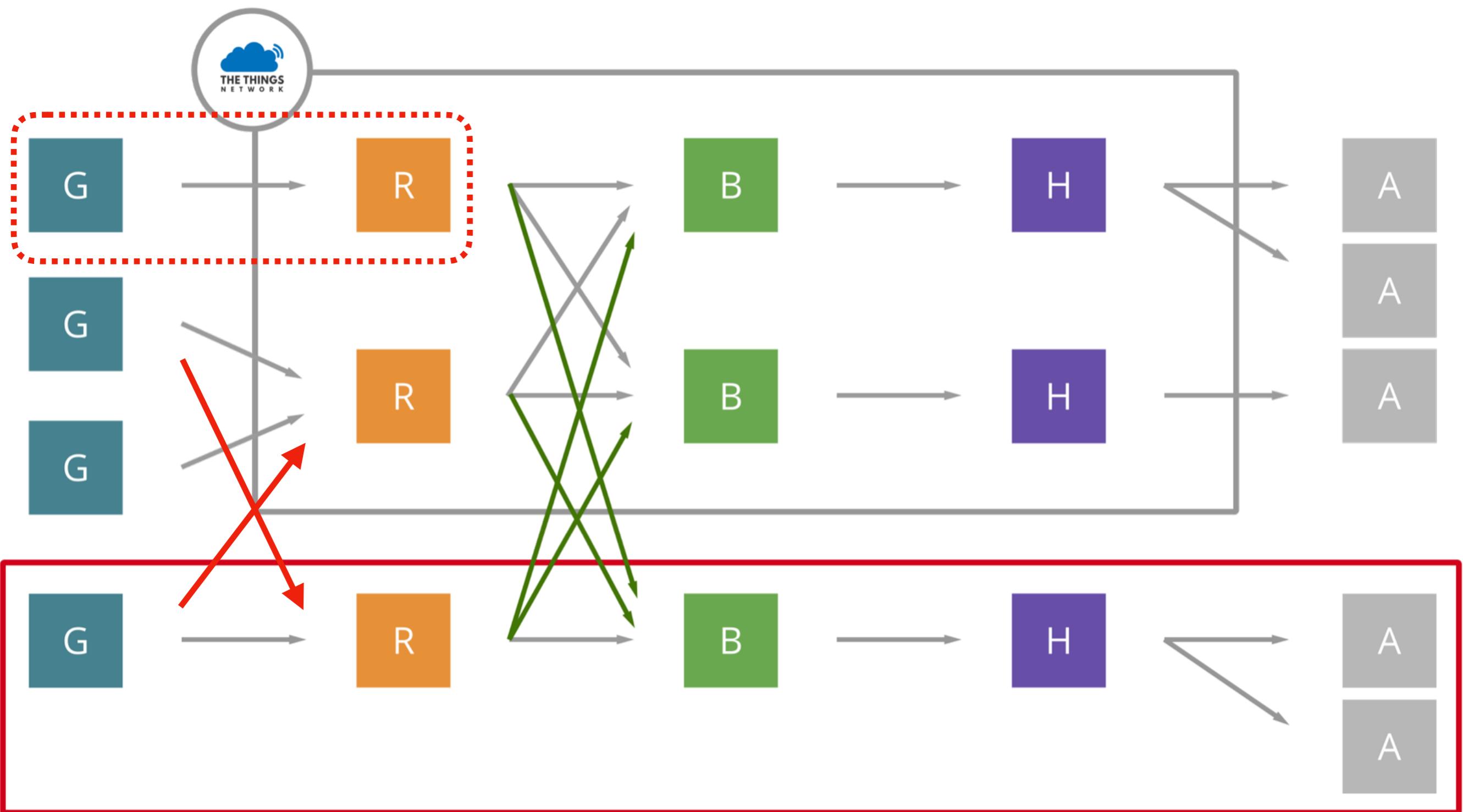




TTN and a private user (YOU!)



TTN and a hacker (YOU?)



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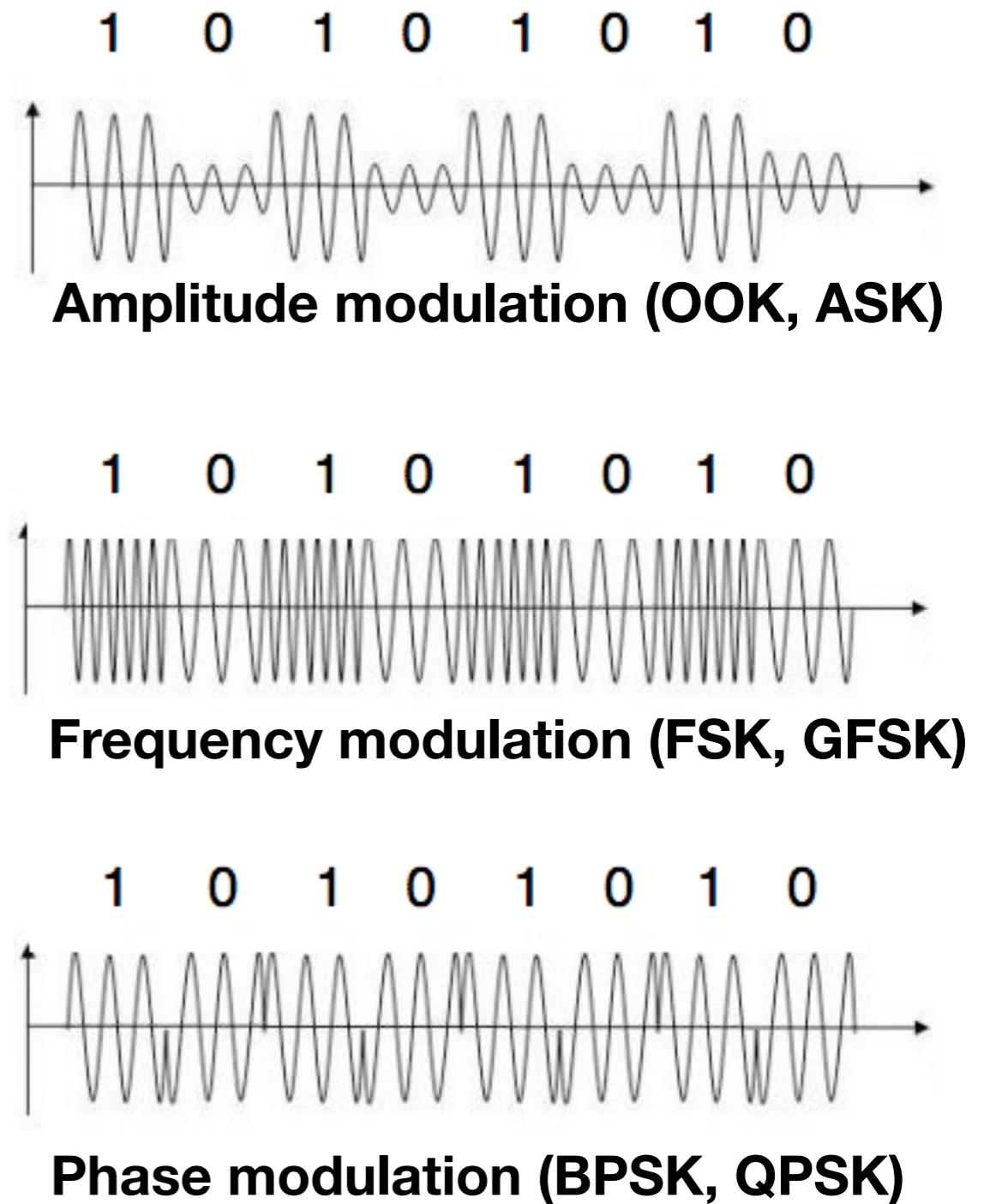
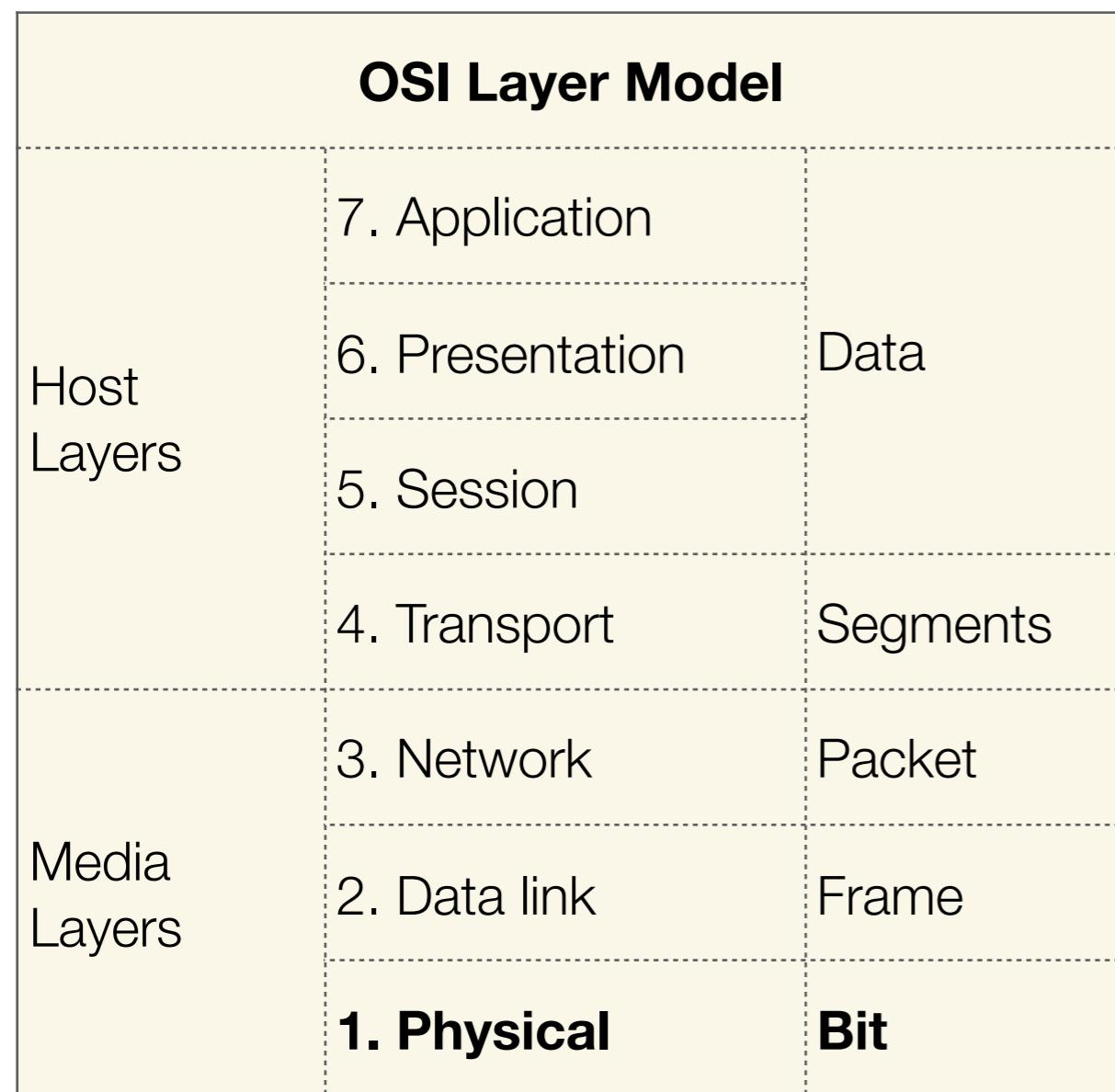
My (short) time with The Things Network.

What is Lora

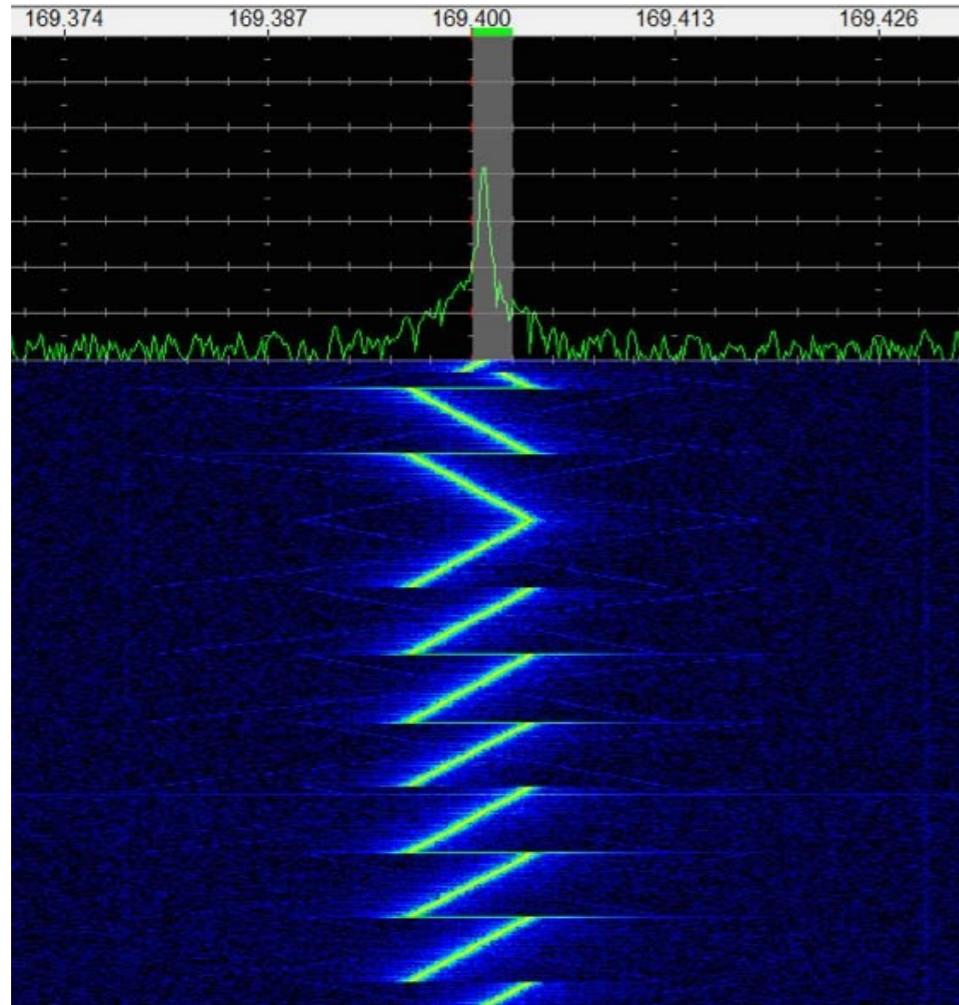
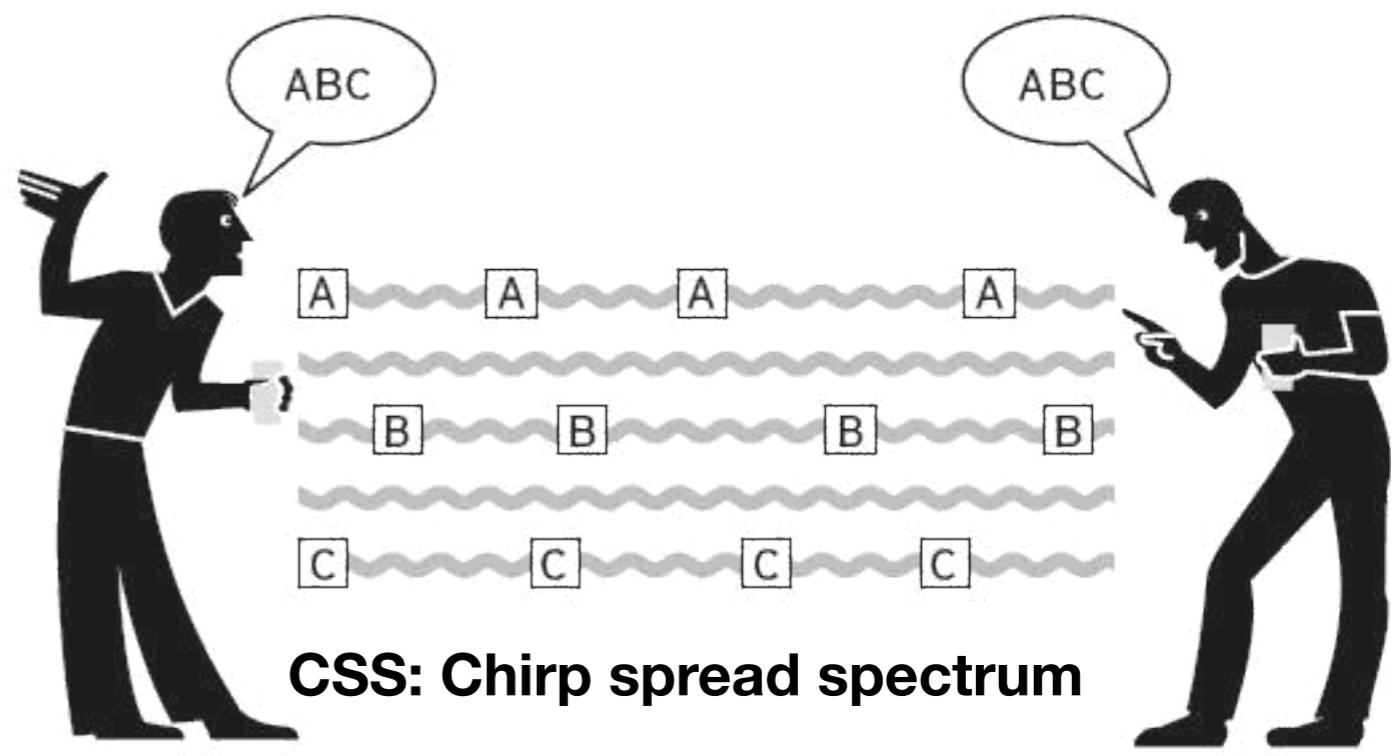
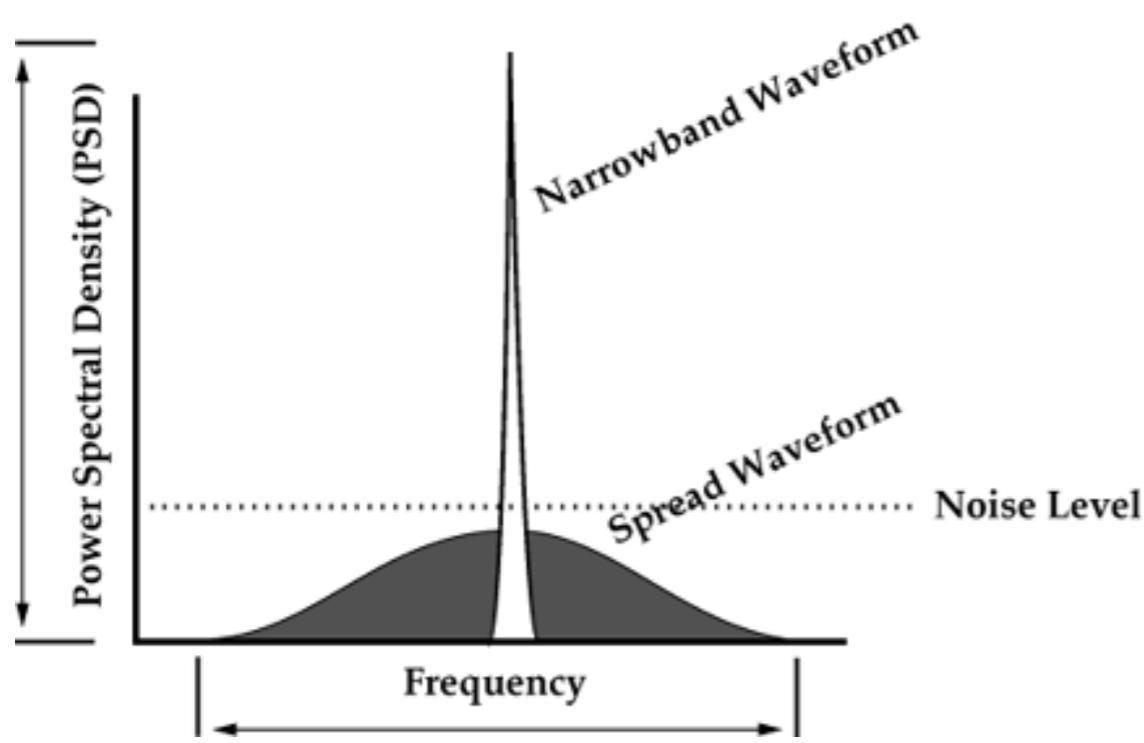
Joining the Lora Alliance?

LoRaWAN in (some) detail

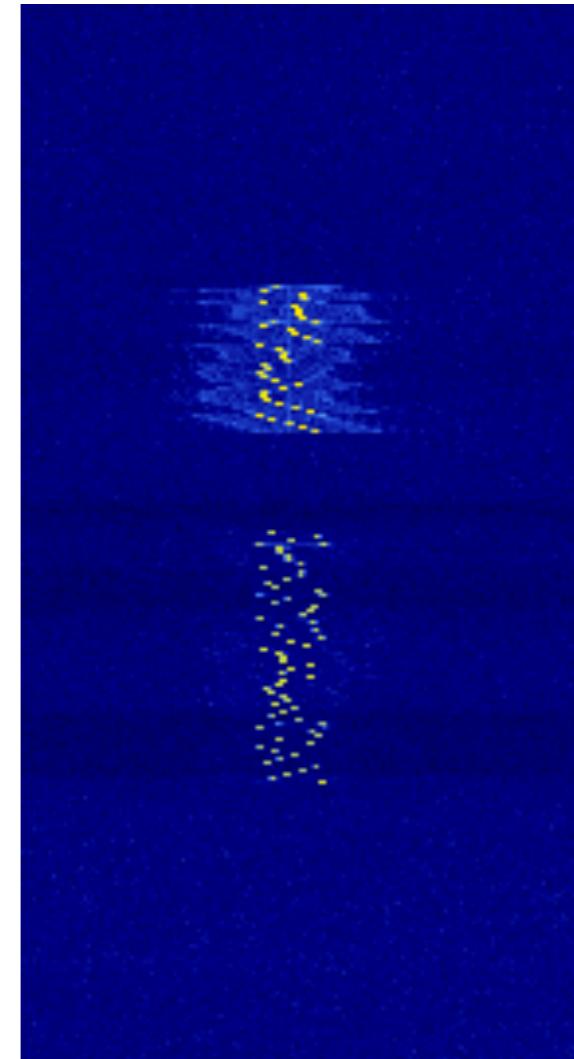
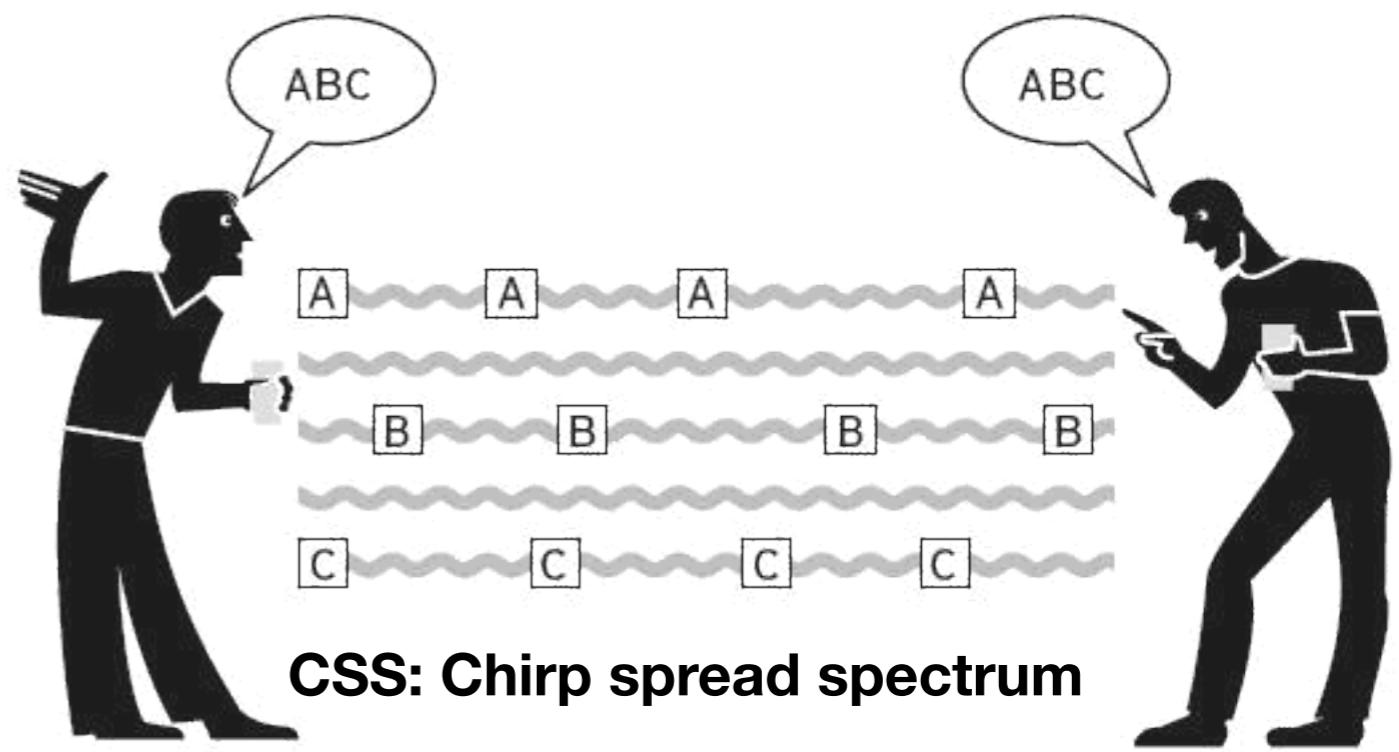
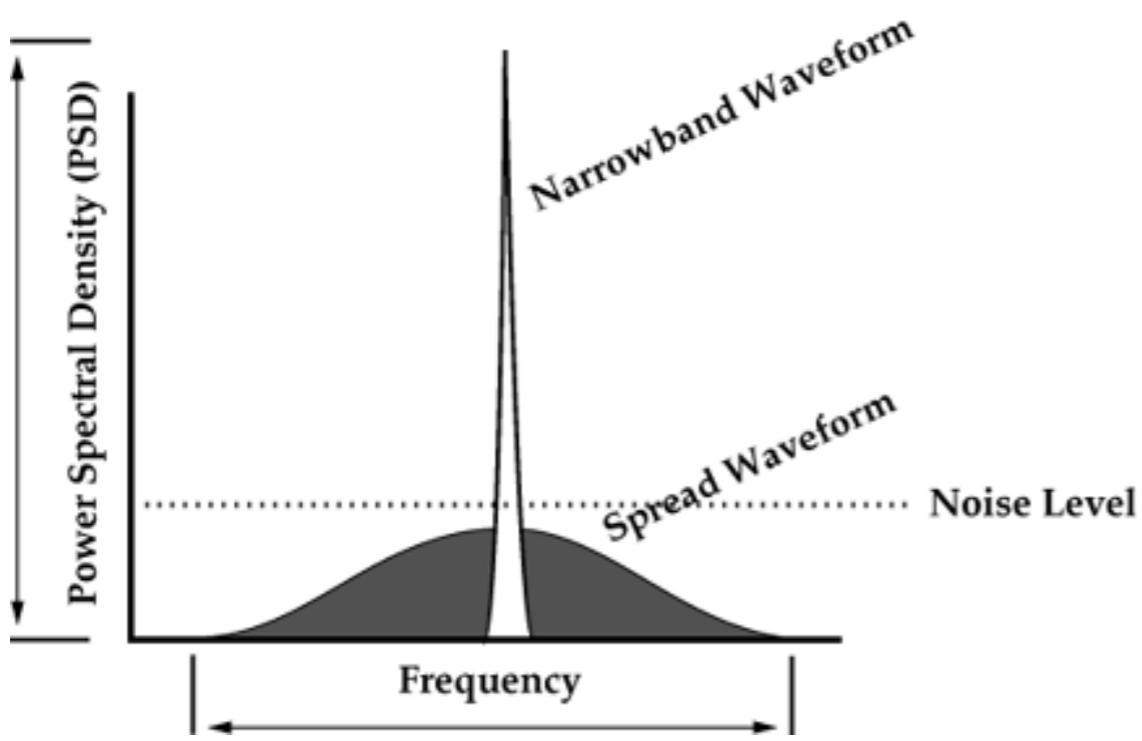
Proposing LoraLight



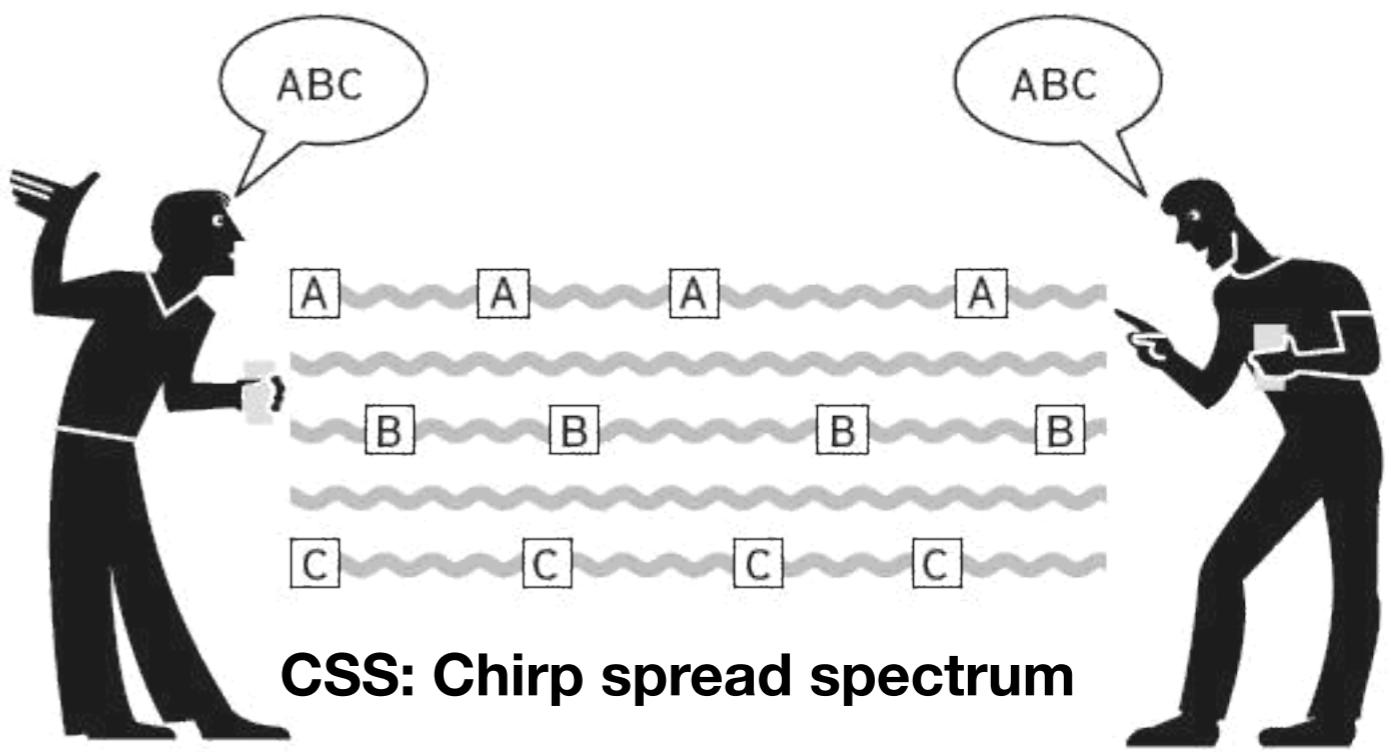
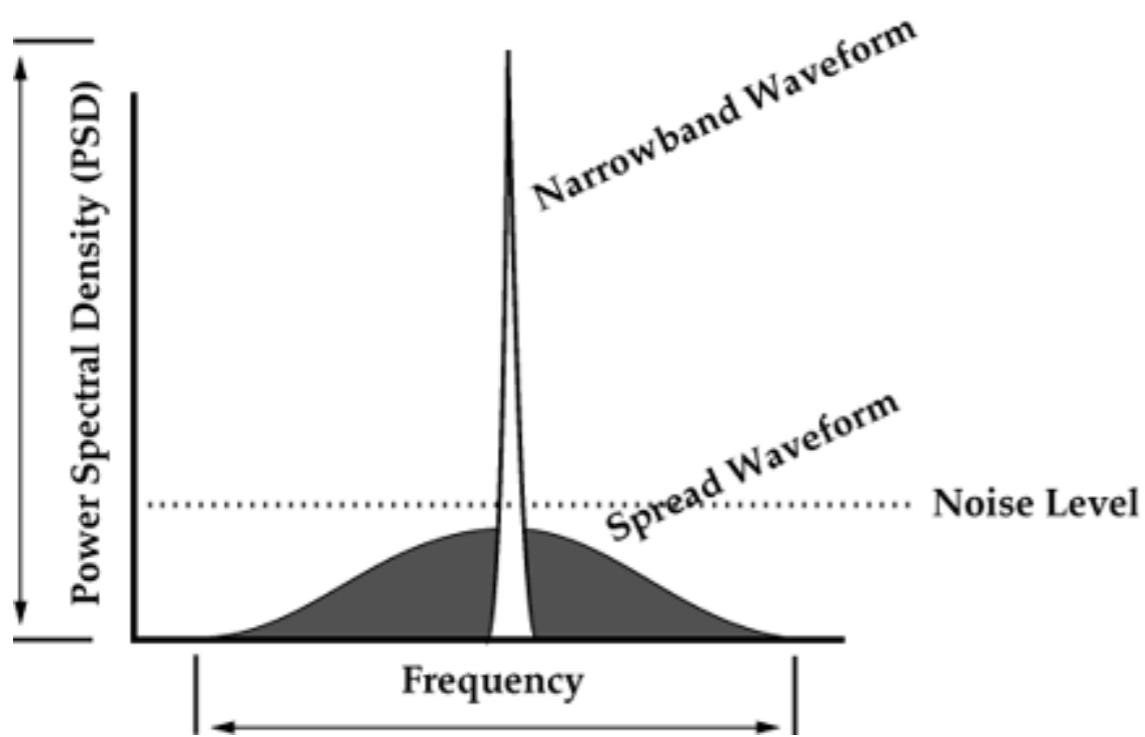
http://xenon.colorado.edu/spotlight/kb/gps_basics/modulations.001.png



Brian Rey LinkLabs (<https://www.link-labs.com/blog/what-is-lora>)

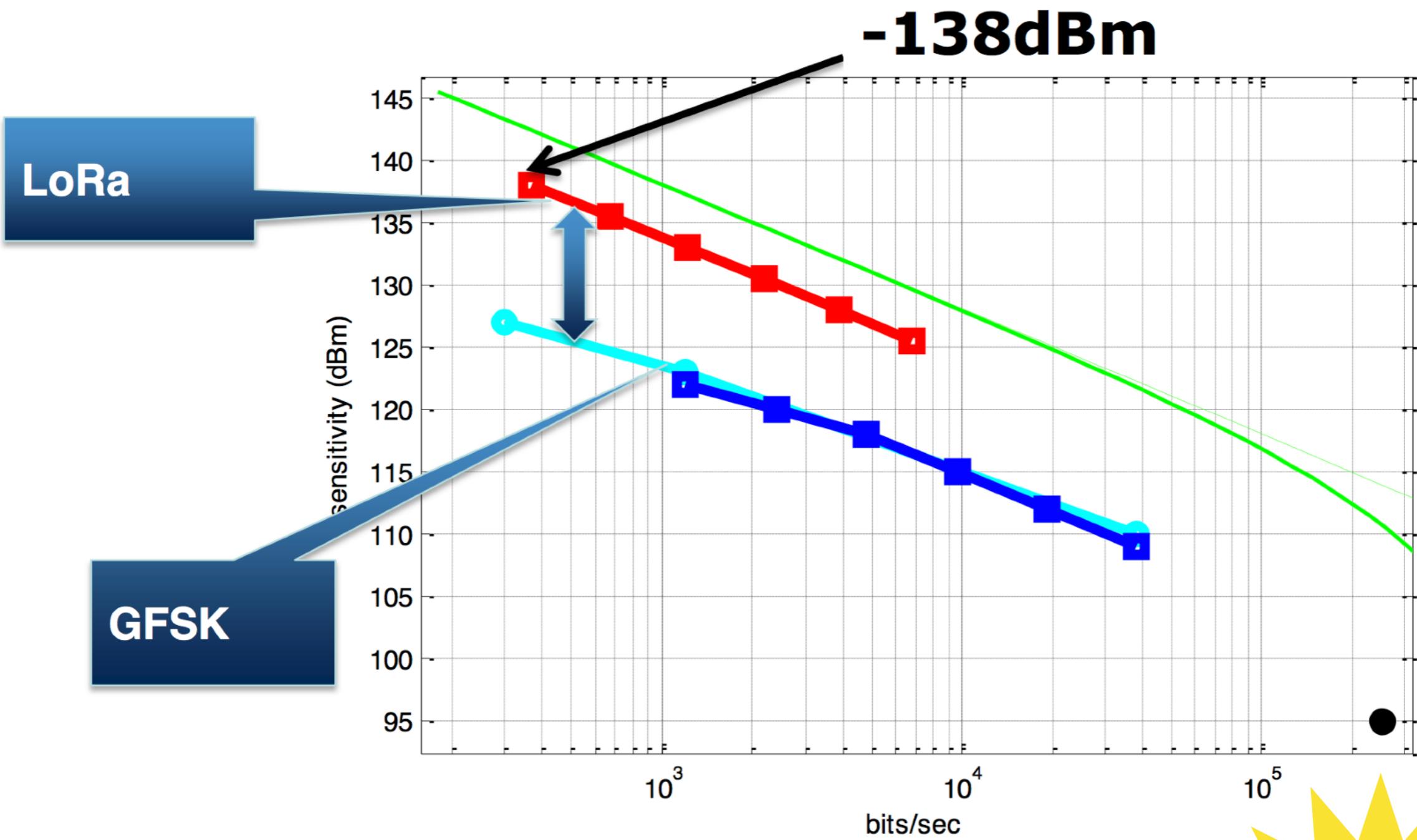


What is Lora



CSS: Chirp spread spectrum

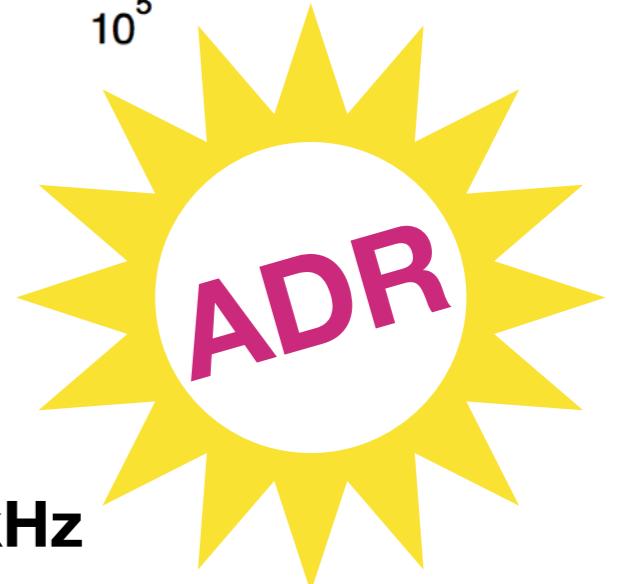




Spreadfactor (SF): 6 ... 12

CodeRate (CR): 4/5 ... 4/8

Bandwidth (BW): 7.8kHz, 10.4kHz 125kHz, 250kHz, 500kHz

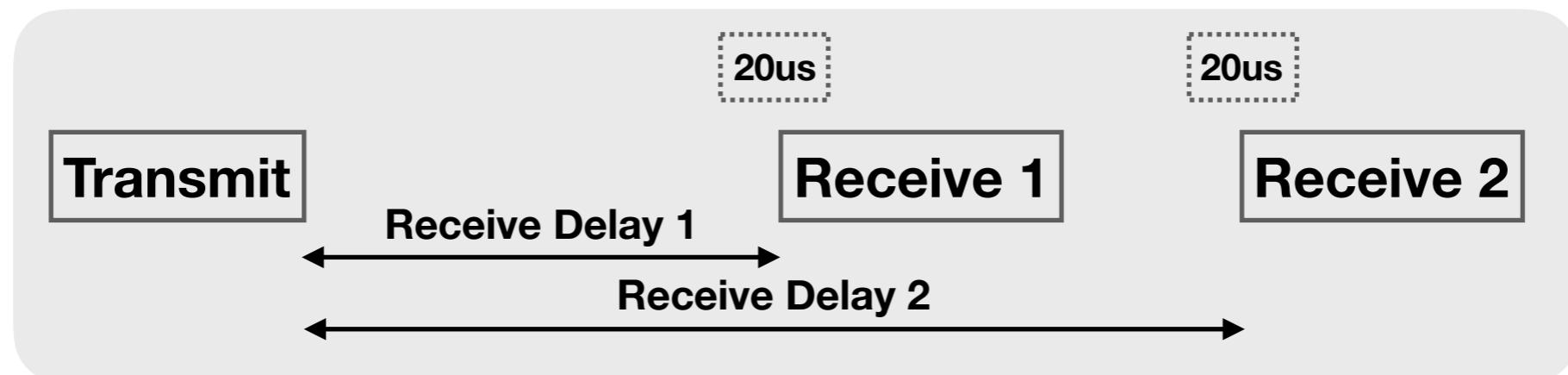
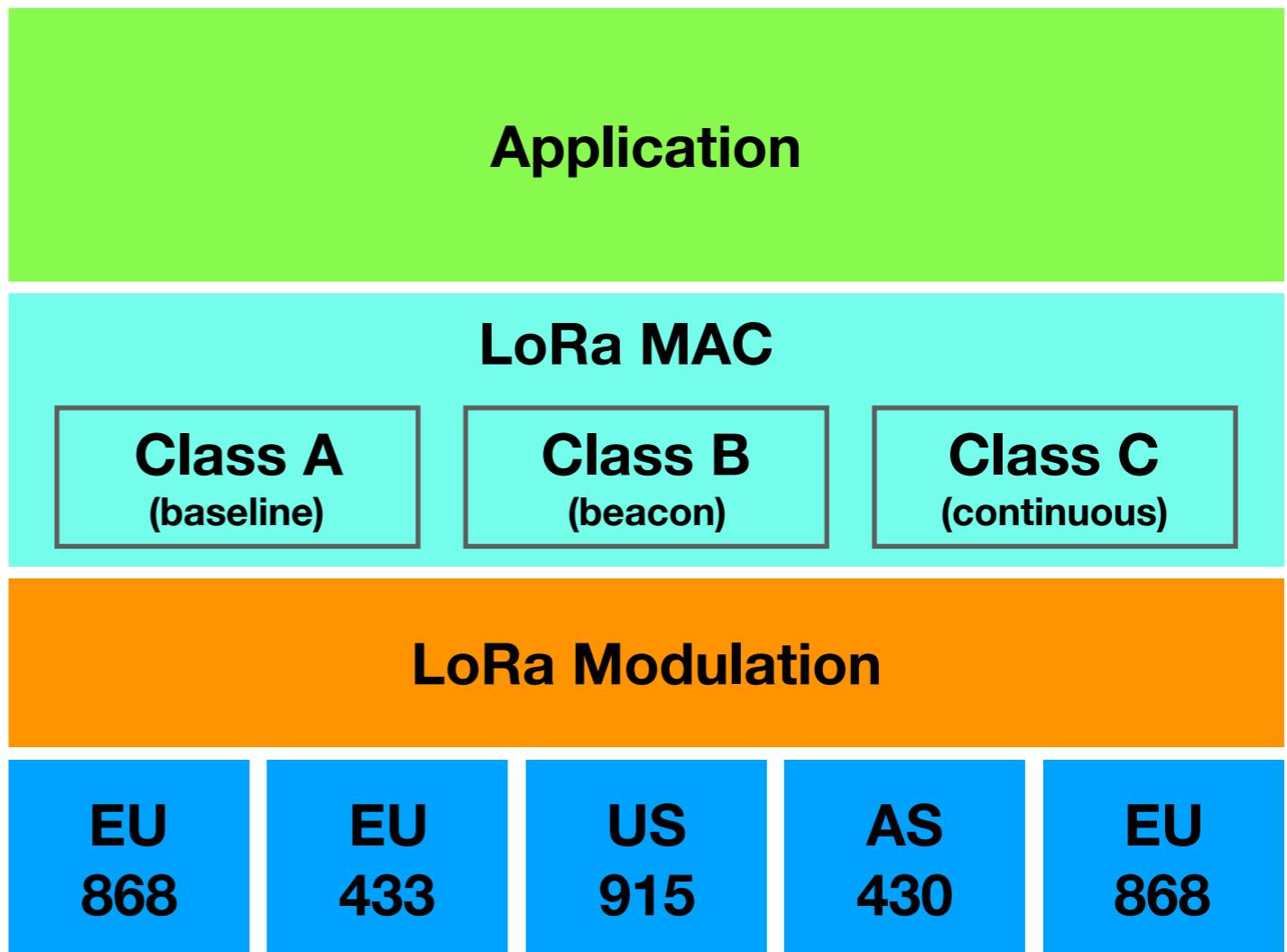


LoRa

Defines how bits are coded using chirps, spreading, corrections etc, but NOT what these bits mean (layer 1).

LoRaWAN

Thus we need a protocol that define the meaning of the bits and how to communicate between two radio endpoints (layer 2 & 3).



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The LoRa Alliance™ Wide Area networks for Internet of Things



The LoRa Alliance is an open, non-profit association of members that believes the internet of things era is now.

What is the rollout plan for network deployments?

KPN, Proximus, Swisscom, Orange, Bouygues, Lace, Senet, Fastnet, Three, SKT, Telstra, Tata have all announcement intentions for nationwide deployments.

FAQ: Is the alliance really a true open standard if Semtech is the only supplier of the RF chips?

Membership Levels and yearly fees:

Adopter Membership: \$3,000

Contributor Membership: \$20,000

Sponsor Membership \$50,000

Institutional Membership: board approval

The LoRa Alliance™ Wide Area networks for Internet of Things



Prefixes Region: Name (NetID)

0x00/0x01 Local: Experimental nodes (0x00)	0x30/0x31 World: Loriot (0x18)
0x02/0x03 Local: Experimental nodes (0x01)	0x32/0x33 World: NNNCo (0x19)
0x04/0x05 World: Actility (0x02)	0x34/0x35 World: Flashnet (0x1a)
0x06/0x07 Europe: Proximus (0x03)	0x36/0x37 World: TrackNet (0x1b)
0x08/0x09 Europe: Swisscom (0x04)	0x38/0x39 World: Lar.Tech (0x1c)
0x0a/0x0b Singapore, indonesia , Australia, Africa , India: SingTel (0x05)	0x3a/0x3b World: Swiss Led (0x1d)
0x0c/0x0d Europe: La Poste (0x06)	0x3c/0x3d CIS, Europe: Net868 (0x1e)
0x0e/0x0f Europe: Bouygues Telecom (0x07)	0x3e/0x3f Italy: Axatel (0x1f)
0x10/0x11 World: Orbiwise (0x08)	0x40/0x41 Germany: Telent (Netzikon) (0x20)
0x12/0x13 U.S: SENET (0x09)	0x42/0x43 World: Patavina Technologies (0x21)
0x14/0x15 Europe: KPN (0x0a)	0x44/0x45 North America: Comcast (0x22)
0x16/0x17 Russia: EveryNet (0x0b)	0x46/0x47 Australia, New Zealand: Ventia (0x23)
0x18/0x19 Africa: FastNet (0x0c)	0x48/0x49 World: Gimasi (0x24)
0x1a/0x1b World: SK Telecom (0x0d)	0x4a/0x4b World: Talkpool (0x25)
0x1c/0x1d World: SagemCom (0x0e)	0x4c/0x4d Italy: Telemar (0x26)
0x1e/0x1f Europe: Orange France (0x0f)	0x4e/0x4f World: MCF88 SRL (0x27)
0x20/0x21 Italy: A2A Smart City (0x10)	0x50/0x51 Malaysia: VADSLYFE (0x28)
0x22/0x23 India, Sri Lanka, Nepal, Bangladesh and the Maldives Islands: TATA Communication (0x11)	0x52/0x53 World: GloT (0x29)
0x24/0x25 World: Kerlink (0x12)	0x54/0x55 World: M2B Communications (0x2a)
0x26/0x27 World: The Things Network (0x13)	0x56/0x57 China: ZTE (0x2b)
0x28/0x29 Germany, Switzerland, China: DIGIMONDO GmbH (0x14)	0x58/0x59 Australia: Airlora (0x2c)
0x2a/0x2b World: Cisco Systems (0x15)	0x5a/0x5b World: Rai Way (0x2d)
0x2c/0x2d China: Computer Network Information Center & Chinese of Sciences Guangzhou Sub-center (CNIC) (0x16)	0x5c/0x5d World: Levikom (0x2e)
0x2e/0x2f World: MultiTech Systems (0x17)	0x5e/0x5f South Africa: Comsol Networks (0x2f)
	0x60/0x61 World: SoftBank (0x30)
	0x62/0x63 World: Inmarsat (0x31)

From: Ruud Vlaming [mailto:ruud@betaresearch.nl]
To: admin@mail.lora-alliance.org <mailto:admin@mail.lora-alliance.org>
Subject: Please send LoRaWAN 1.0.2 and Regional Parameters Docs

LS,

I am a software developer for the Lorank8 LoraWAN gateway.
Could you please send me the latest specification?

Thank you, Ruud.

Op 25/07/2017 om 22:05 schreef LoRa Alliance Administration:

Thank you for contacting the LoRa AllianceT Administration. Per your request, please find the LoRaWANT Specification 1.0.2 and LoRaWAN Regional Parameters 1.0.2 documents attached.

Please let us know if we can provide any additional assistance.
Best Regards, The LoRa AllianceT Administration

From: Ruud Vlaming [mailto:ruud@betaresearch.nl]
To: admin@mail.lora-alliance.org <mailto:admin@mail.lora-alliance.org>
Subject: Re: Please send LoRaWAN 1.0.2 and Regional Parameters Docs

Thank you. I have one question though. Since these specs are not freely available on the Internet (at least i could not find them), should they be kept secret?

Kind Regards, Ruud.

Op 31/07/2017 om 23:53 schreef LoRa Alliance Administration:

Thank you for seeking clarification. The LoRaWAN Specifications are intended to only be viewed by the person requesting them. Should anybody else be interested in viewing a copy of the specifications we simply ask that they email their request to the LoRa AllianceT Administration.

Please let us know if we can provide any further assistance.
Best Regards, The LoRa AllianceT Administration

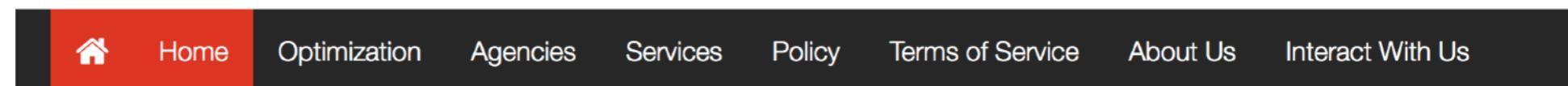


The Internet Corporation for Assigned Names and Numbers (ICANN, /'aɪkæn/ EYE-kan) is a nonprofit organization responsible for coordinating the maintenance and procedures of several databases related to the namespaces of the Internet, ensuring the network's stable and secure operation. (Wikipedia)



The internet is global, yet most of the world's users see only a small part of it. There are many more TLDs (top level domains) available for you ... Remember, this is YOUR internet! It's not ICANN's or WIPO's, or any one government's. It's YOURS.

YouCann.here!



Breaking News:

4 Benefits Of Hiring An Seo Agency



Joining the Lora Alliance?

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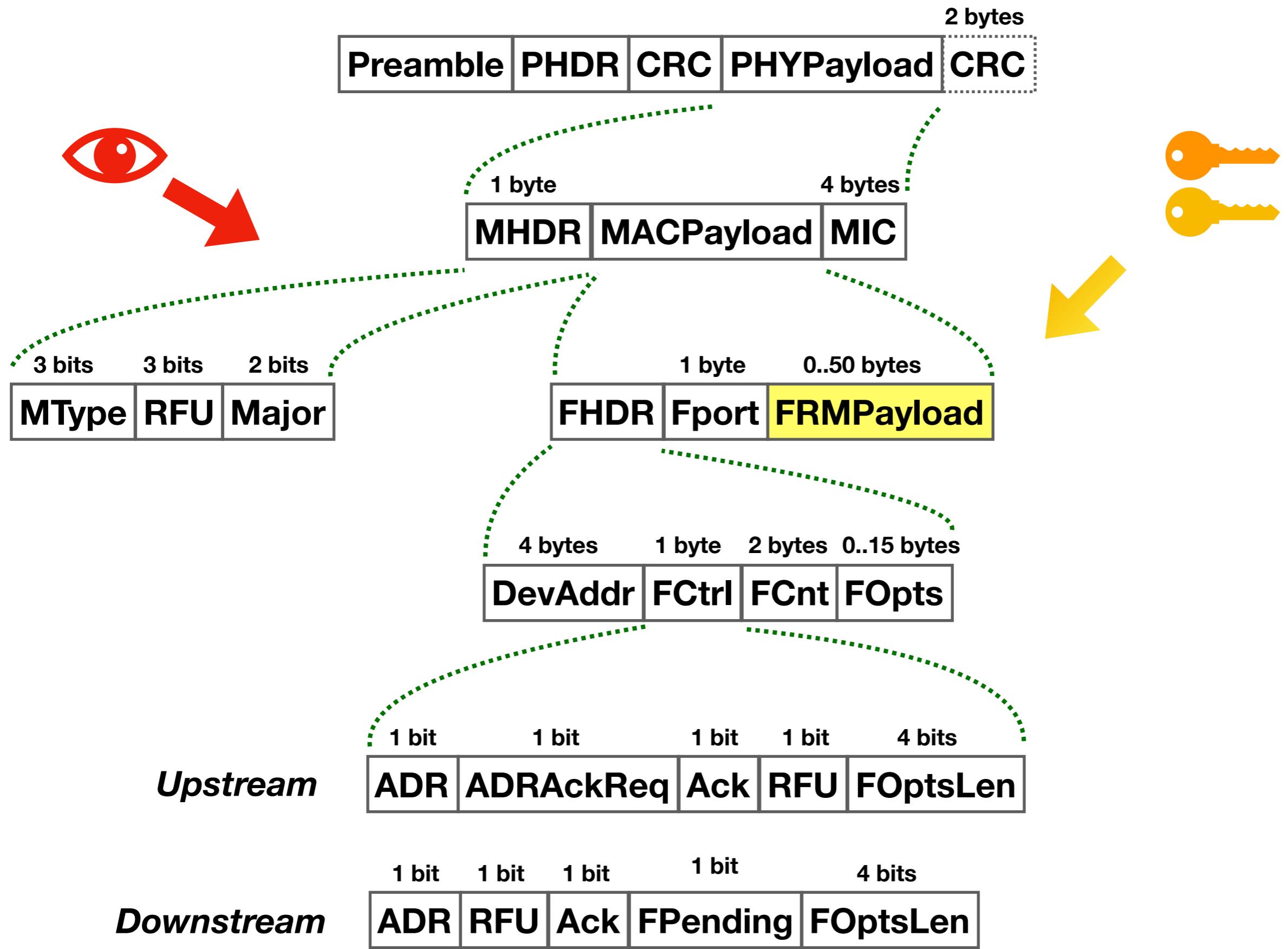
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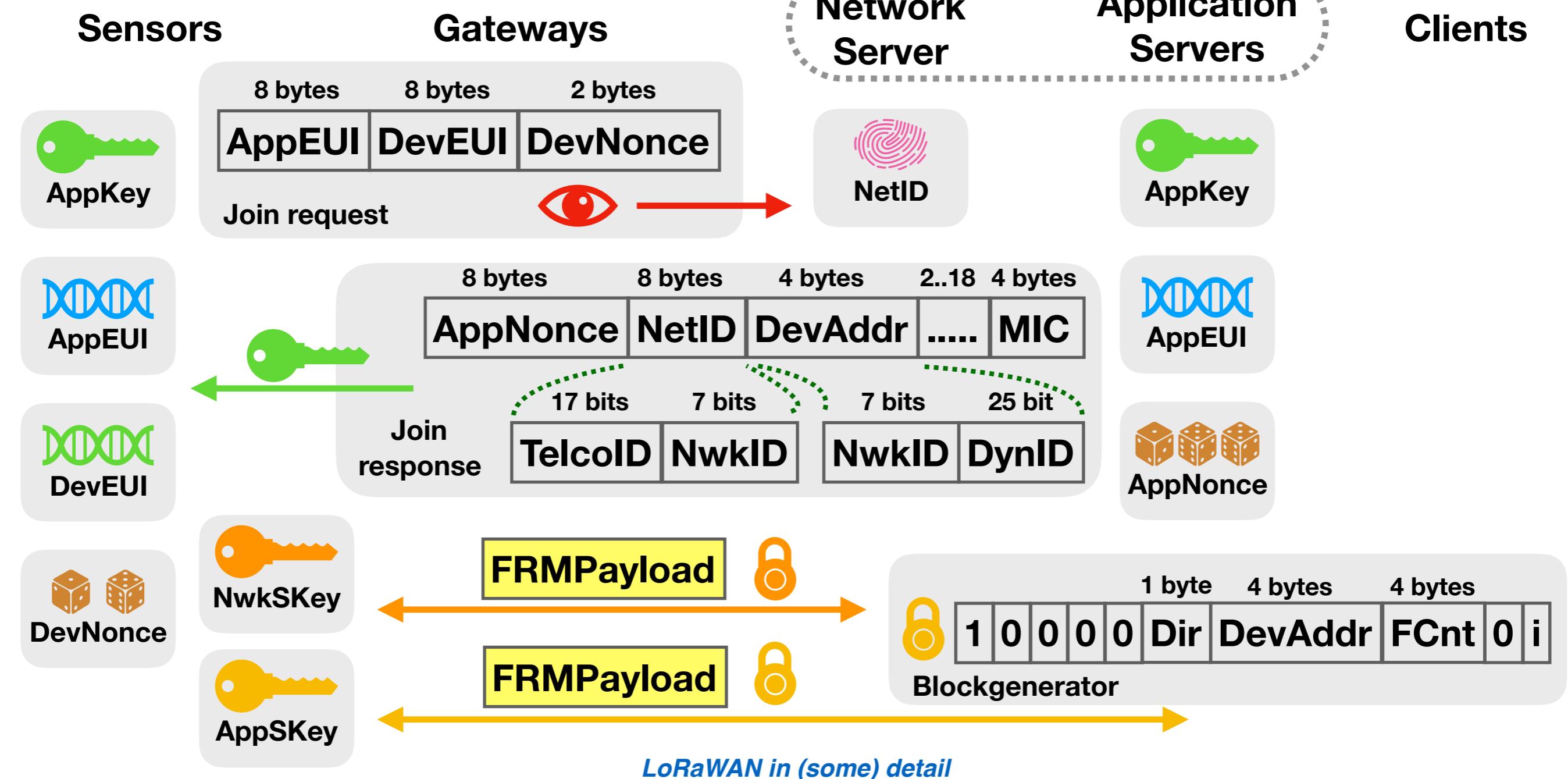
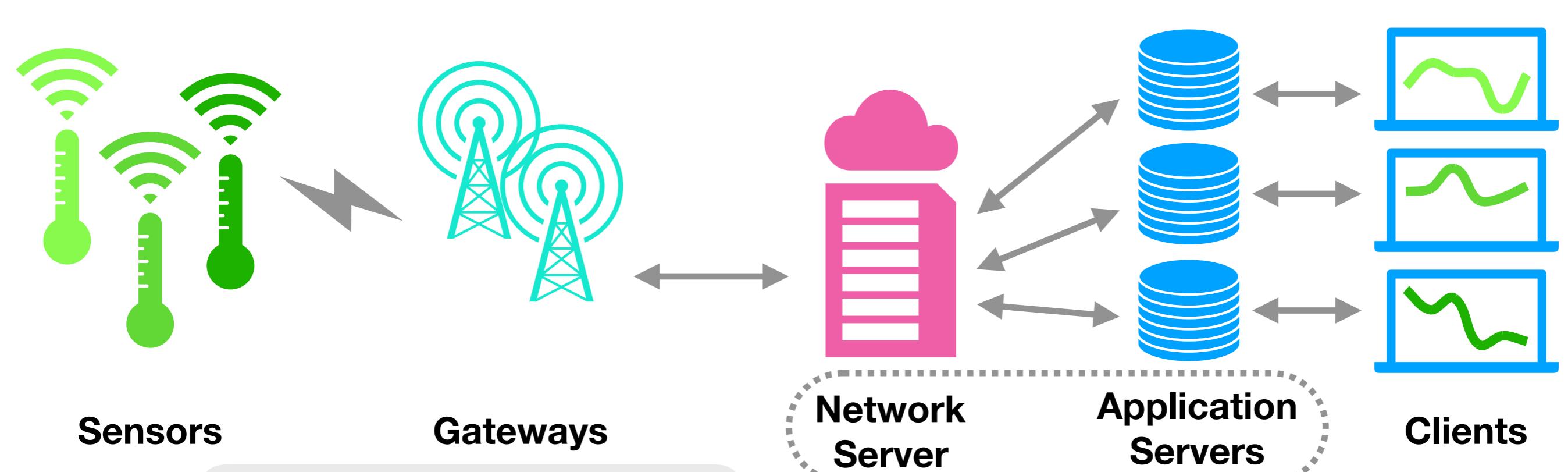
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Rescuing LoRaWAN 1.0

Gildas Avoine & Loïc Ferreira

Cryptology ePrint Archive: Report 2017/651

received 30 Jun 2017; withdrawn 7 Jul 2017

Real Protocol flaws exists:

No physical access to the device is needed, attacks can be made over the air by eavesdropping, replay and sending constructed data.

Not implementation related

Weaknesses:

Join procedure: Device cannot detect if join-accept message corresponds to join-request. Replay attack is possible.

ADR procedure: 96 frames for decryption, and possibility for fake acknowledgement.

Network servers are considered as trusted (spec 6.1.4)

Consequences:

(a long) disconnection between the device and the network because both drop each others messages due to different keys.

Payload may be changed by Network Server or hacker therein.

Rescuing LoRaWAN 1.0

Gildas Avoine & Loïc Ferreira

Cryptology ePrint Archive: Report 2017/651

received 30 Jun 2017; withdrawn 7 Jul 2017

What are the core problems?

1. The role of the Network Server is connected with the Application Server too much
2. The device can be configured by the Network Server to a large extend
3. A large part of the communication (of this configuration) happens in the clear
4. Joining procedure is vulnerable.

**The most simple solution would be to take the Network Server out of the loop.
However, this would reduce the controlling power of the telco's (TTN) drastically!**

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What would an ideal protocol?

Free to be used by anyone and freely available

No payments for some unique combination of bits

Free use of some (public?) infrastructure

No roaming required

Be able to build your own infrastructure

Allow your nodes to be public as well as private

Direct data availability (no man in the middle)

What would an ideal protocol?

Up and down link

Allowing for multiple gateway connections

Side by side use with LoRaWAN

Easy to implement

Stateless operation

Direct access via IPv6?

....

www.ziggo.nl/zakelijk/zoeken/?q1=ipv6

Zoeken

ZIGGO
zakelijk

Prive **Zakelijk** Ziggo GO Entertainment Mijn Ziggo Ziggo Mail Zoeken

Alle producten Alles-in-1 Internet Telefonie Televisie Mobiel

0 resultaten gevonden voor "ipv6"

We hebben geen resultaten gevonden die overeenkomen met je zoekopdracht.

Gebruik onderstaande tips om je zoekopdracht te verbeteren.

- Controleer de spelling van de zoekterm.
- Voeg enkele sterretjes toe aan de zoekterm.
- Probeer woorden uit de zoekterm te verwijderen.

HOME PROFIEL CONTACT UITLOGGEN BERICHTEN Beta Research Klantnummer 19892 Help

Klantenpagina Fxw.nl

Home Mijn producten DNS Domein registratie Mijn facturen Help Center Bestellen

Welkom bij onze chat

Hesdy Support Agent

Haloo Vlaming. Waarmee kan ik u van dienst zijn?

Vlaming ik type ipv6 in maar geen hits in de kennisbank.

Doen jullie er nog helemaal niets mee?

Of kan ik al een range aanvragen, en zo ja hoe groot is die dan?

Hesdy Een moment alstublieft, ik kijk het even na.

Daar doen we nog niks mee

Zoeken in kennisbank Zoeken Kennisbank categorieën

Gevonden resultaten voor ipv6

Geen resultaten gevonden met gezochte criteria

Terug

Powered by LiveChat

Consequences of requirements

No negotiation between node and gateway

No ADR

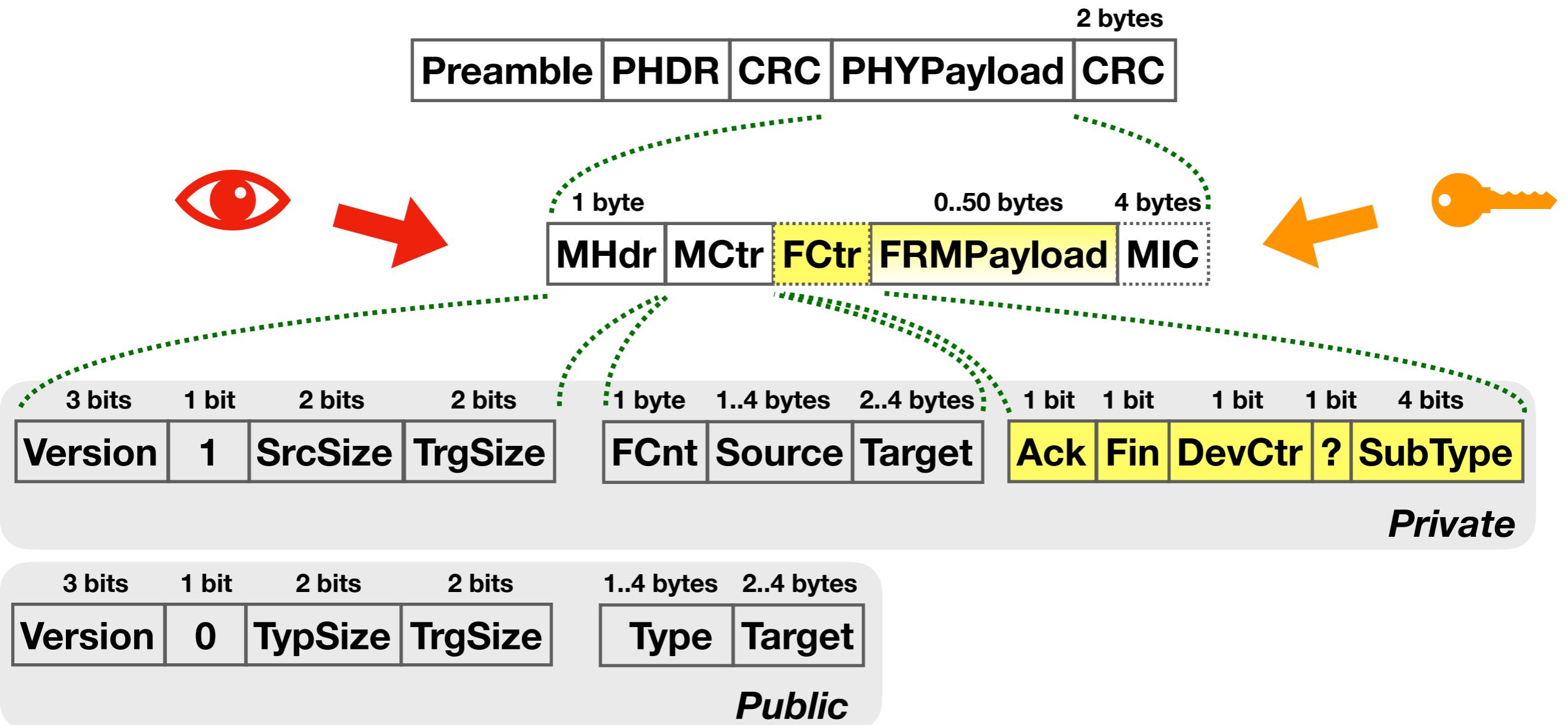
Demands on timing synchronisation

Permanent presence of receiving server

Cooperation of gateway providers

Dependence on IPv4 or the DNS

....

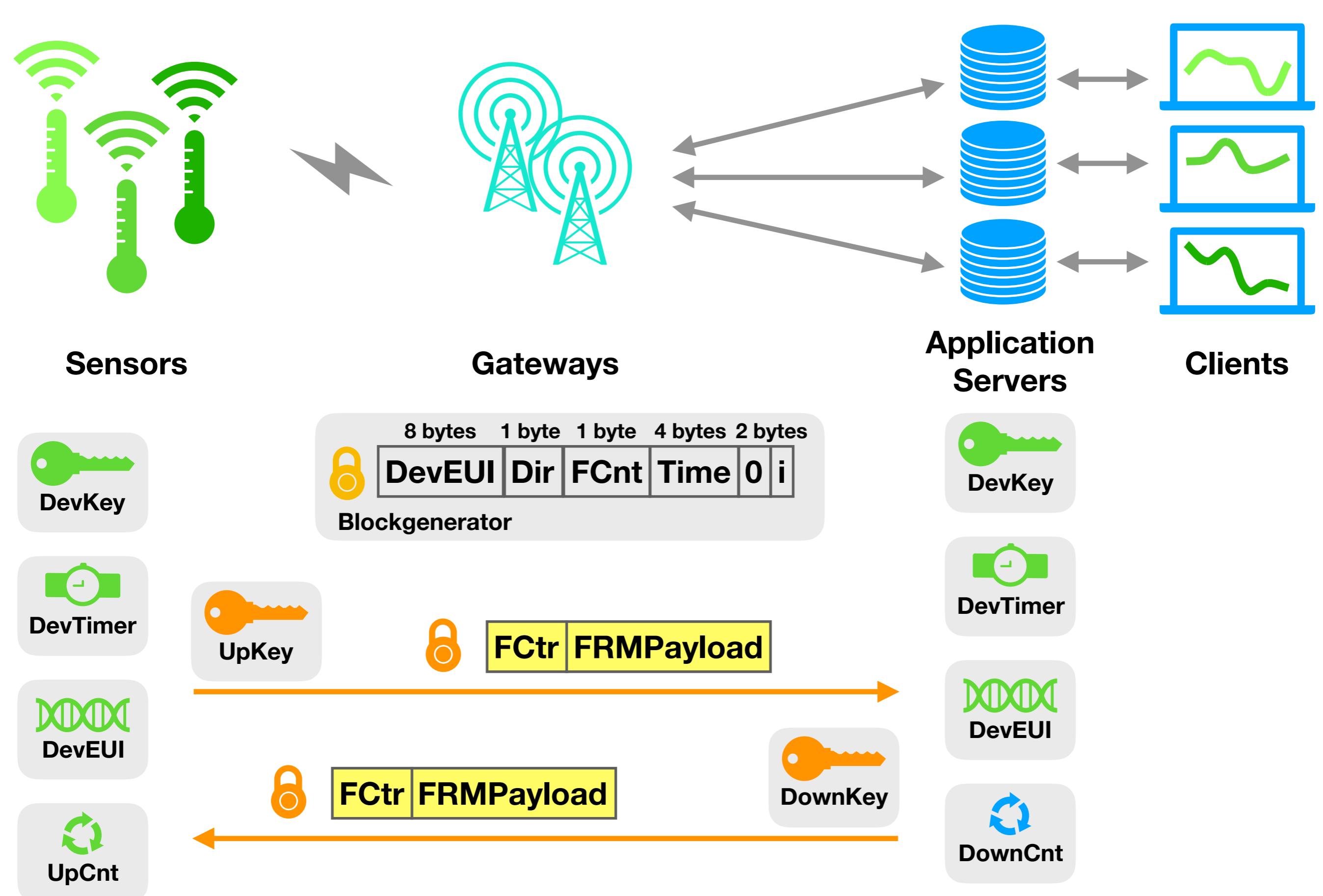


Src/Typ Size

- 00 => 1 byte
- 01 => 2 bytes
- 10 => 3 bytes
- 11 => 4 bytes

TrgSize

- 00 => IPv4
- 01 => xxxx-LL.net
- 10 => xxxxxx-LL.net
- 11 =>xxxxxxxx-LL.net



Summary

Importance of IoT

Technology behind Lora and LoraWAN

Weaknesses and vulnerabilities of LoraWAN

Risk of Network Operator dominance

Possible solution "LoraLight"

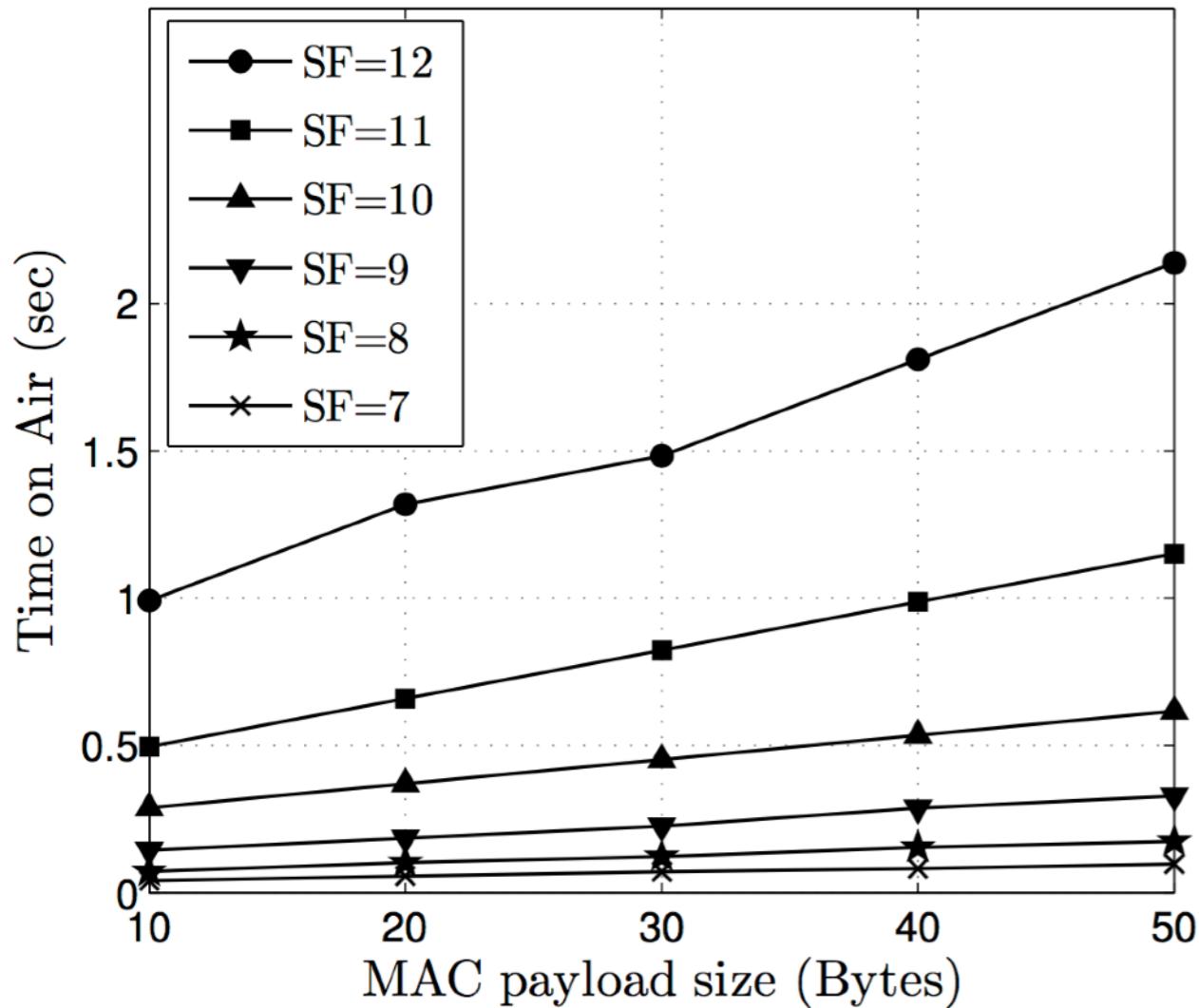


Summary

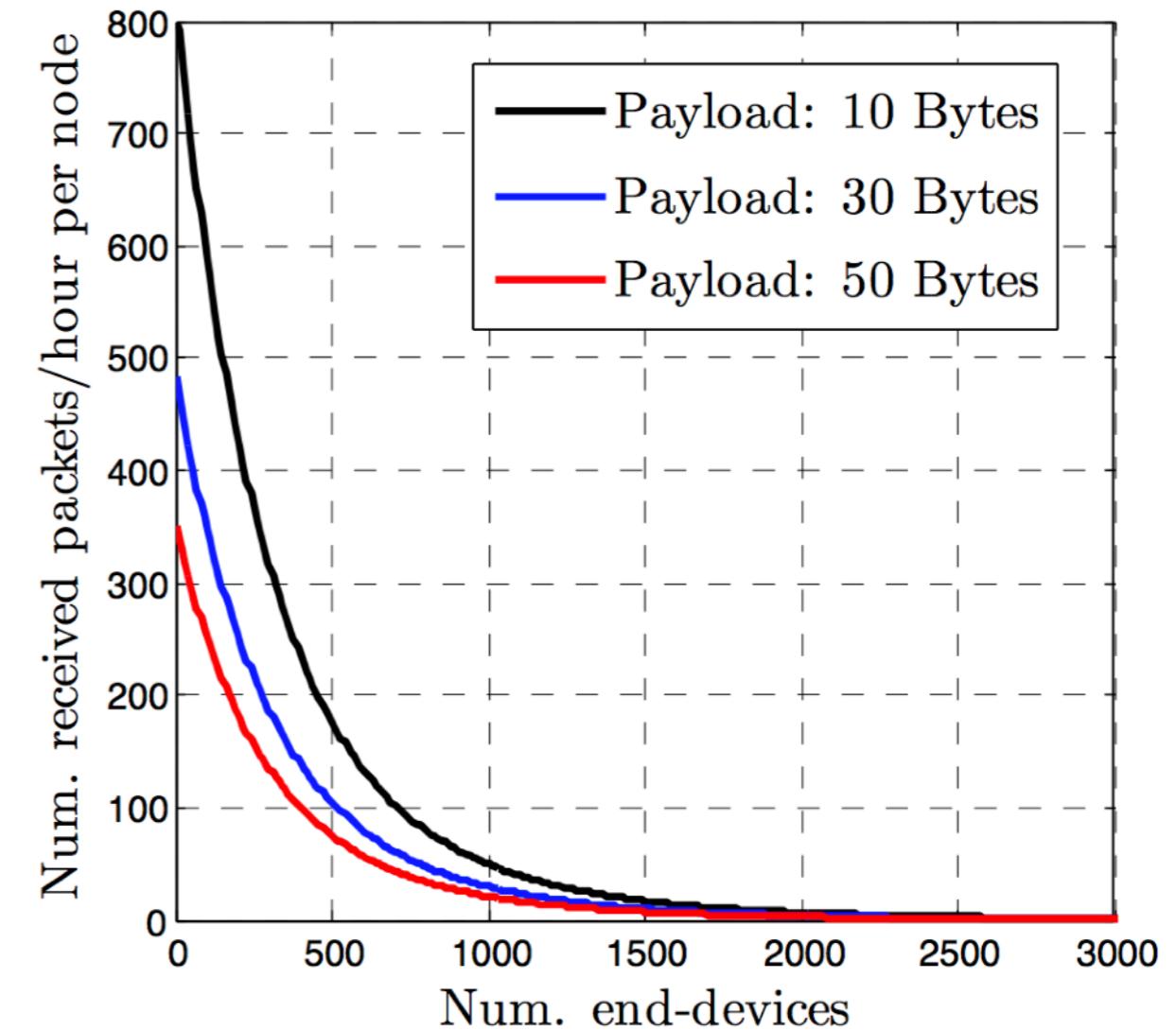
Understanding the Limits of LoRaWAN

Ferran Adelantado, Xavier Vilajosana, Pere Tuset-Peiro,
Borja Martínez, Joan Melià-Seguí, Thomas Watteyne.

IEEE Communications Magazine in January 2017

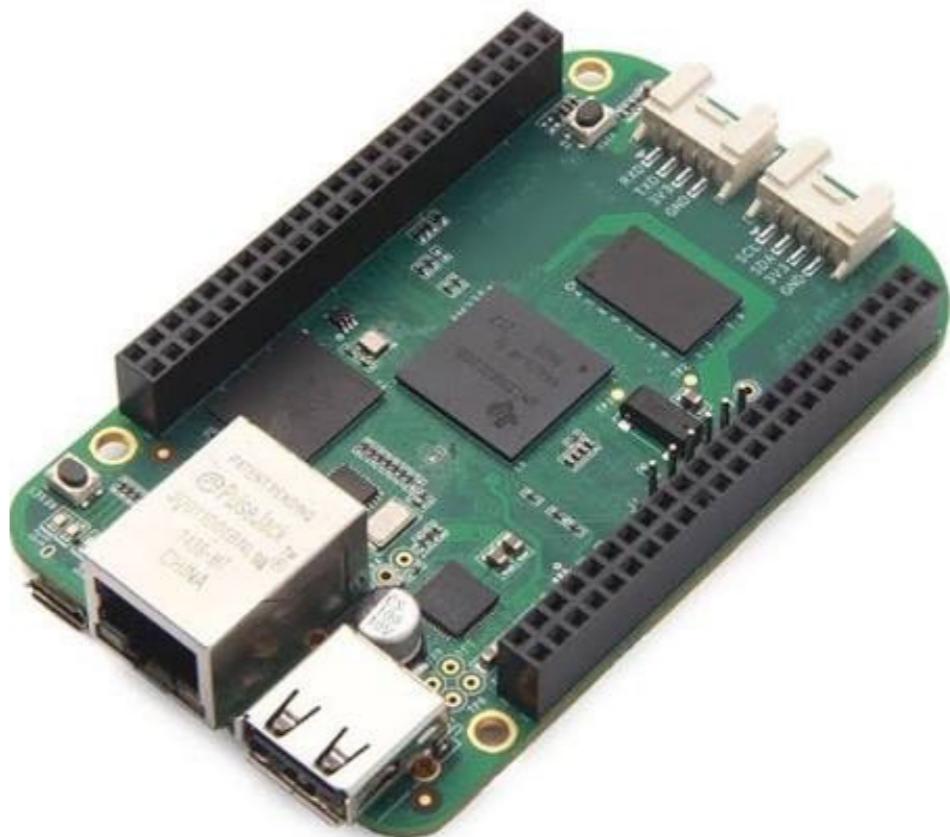
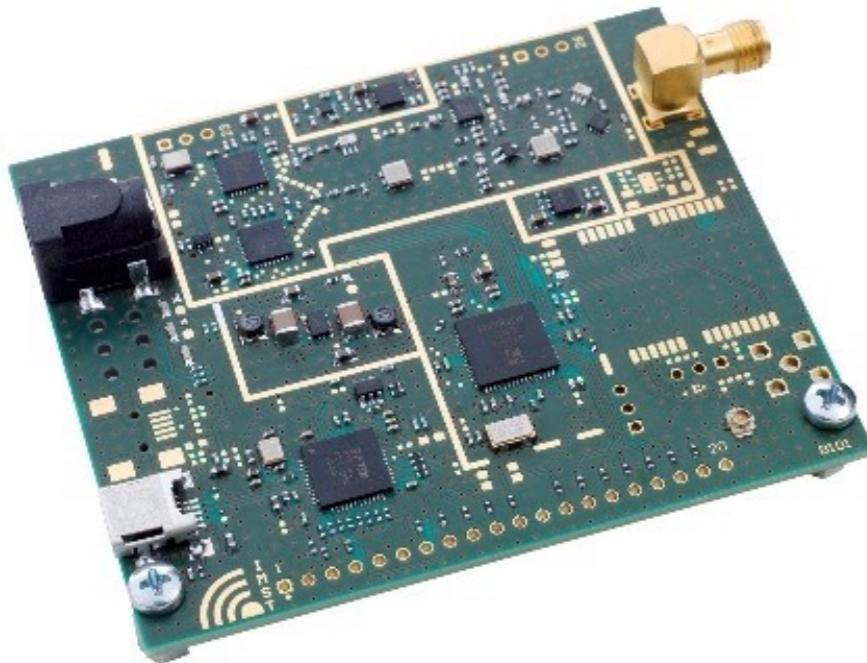


Time on Air of LoRaWAN with code rate 4/5 and a 125 kHz bandwidth.



Number of packets received per hour when end-devices attempt transmission at nd/T_{ai} packets/sec with coding rate 4/5 and n = 3 channels with 125 kHz bandwidth.

Building your own gateway



<https://github.com/Ideetron/Lorank>

Branch: master ▾

New pull request



devlaam Repaired ownership after untar



[lorank8v1](#)

Repaired ownership after untar



[.gitattributes](#)

extended web interface with more statistics



[.gitignore](#)

upgrade script added



[LICENSE](#)

Initial commit

extra stuff