M2M connectivity

SIGFOX
One network A billion dreams

LoRa™

3GPP™
A GLOBAL INITIATIVE

[1]

M2M Connectivity

LPWAN Technologies

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April 2017

Presentation: TelSoc

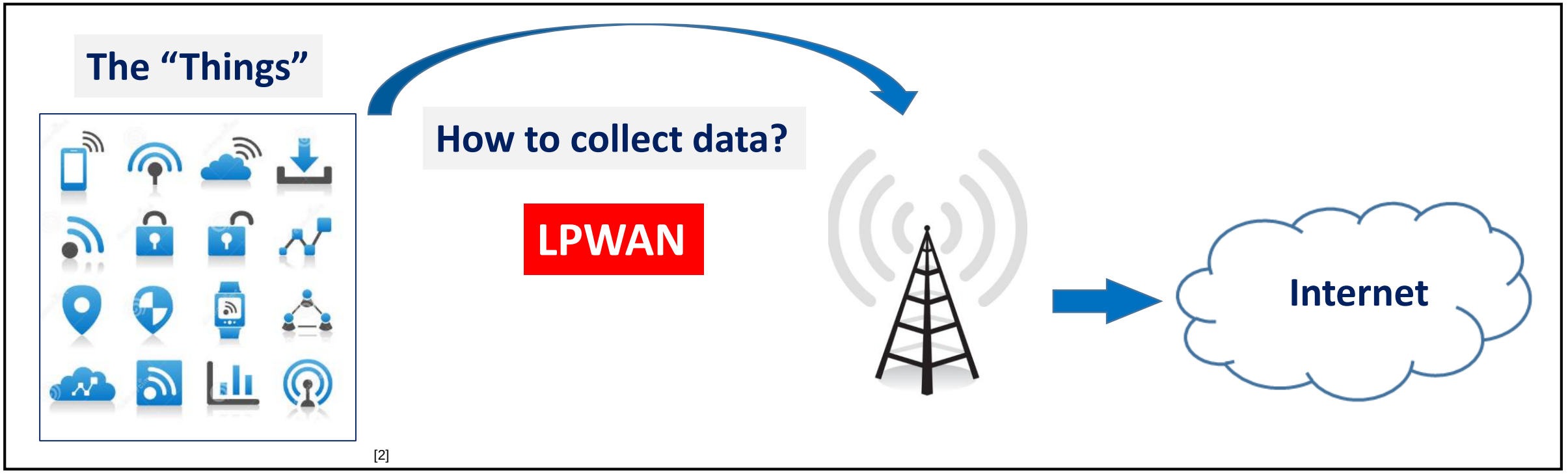
Agenda

This presentation will cover:

- LPWAN in IoT
- Technical review on the more popular LPWAN technologies: Au/NZ market
- Live Demo if time permitted

IoT (Internet Of Things)

- Connect any device to the Internet
- The “thing” could be a sensor, an animal, a car, …
- There will be “things” that transmit tiny amounts of data, work on battery and “far” from base stations



[2]

LPWAN (Low Power Wide Area Network)

Context:

- Designed for Internet of Things (IoT)
- Low Power Devices (i.e. Power Efficiency) – years of use
- Long Range – Km
- Low Data Rate from the “Things”

Several Technologies:

- There is no one-size-fits-all technology

LPWAN (Low Power Wide Area Network)

LPWAN (Low Power Wide Area Network)

Cellular

Cellular

Standard Definition:

Spectrum:

Licensed Band

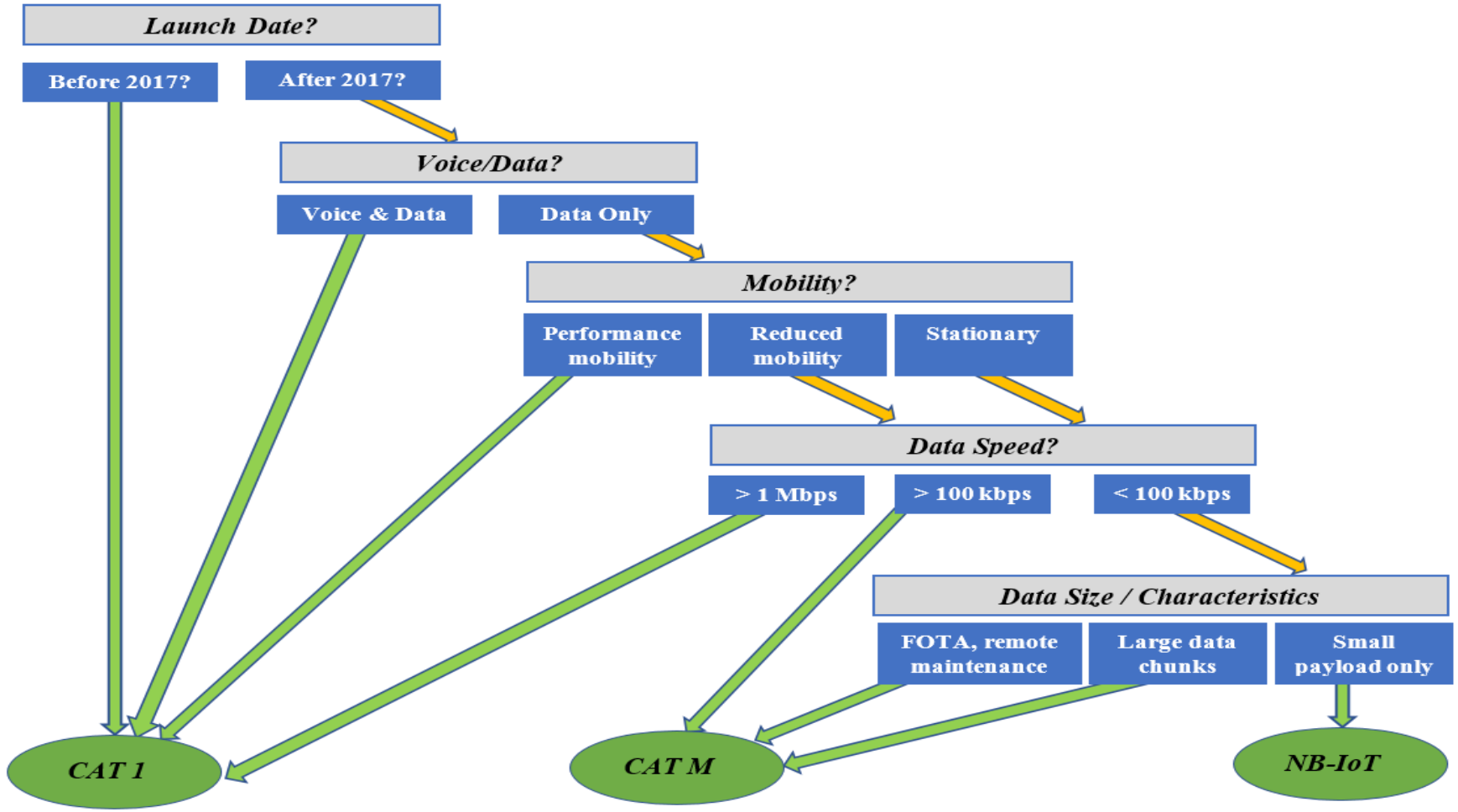
Network owner:

Telcos

Cellular - Standard Evolution

	Cellular Technology			
	EC-GSM-IoT	LTE-CAT 1	LTE-CAT M1 (eMTC, referred as Category M or LTE - M)	NB-IoT (referred as LTE - CAT 2/M2)
Release	Release 13	Release 8	Release 13	Release 13
# Messages Per Day	Variable	Variable	Variable	Variable
Data Rate	< 140 Kbps (DL/UL)	< 10 Mbps (DL) < 5 Mbps (UL)	200 Kbps - 1 Mbps (DL/UL)	< 100 Kbps (DL) < 150 Kbps (UL)
Frequency Band	Licensed - GSM bands	Licensed LTE bands In-band	Licensed LTE bands In-band	Licensed LTE in-band guard-band stand-alone
Time to Complete	2017	2017	Late 2017	2018…

Standard Evolution:



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LPWAN (Low Power Wide Area Network)

Sigfox

Network Architecture:

thinxtra
Empowering Internet of Things

Devices belong to customer:
- Own development
- Finish product

Note: Open to any manufacturer, Sigfox does not own the technology

Data belongs to customer (any 3rd party)

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Network deployment (ownership) – Sigfox or partners. In Australia: Thinxtra
Airtime provided by partners or resellers

Sigfox

Capacity:

Data

- 12 Bytes Max

Range

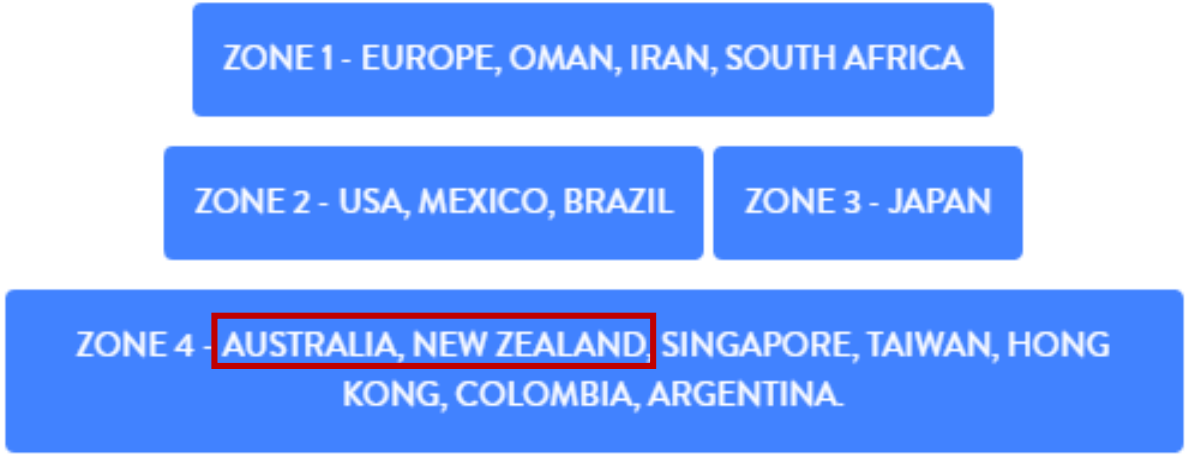
- 30 – 50 km rural areas
- 3 – 10 km urban areas

Number of messages

- Up to 140 per day per sensor
- Up to 4 downlink messages per day per sensor

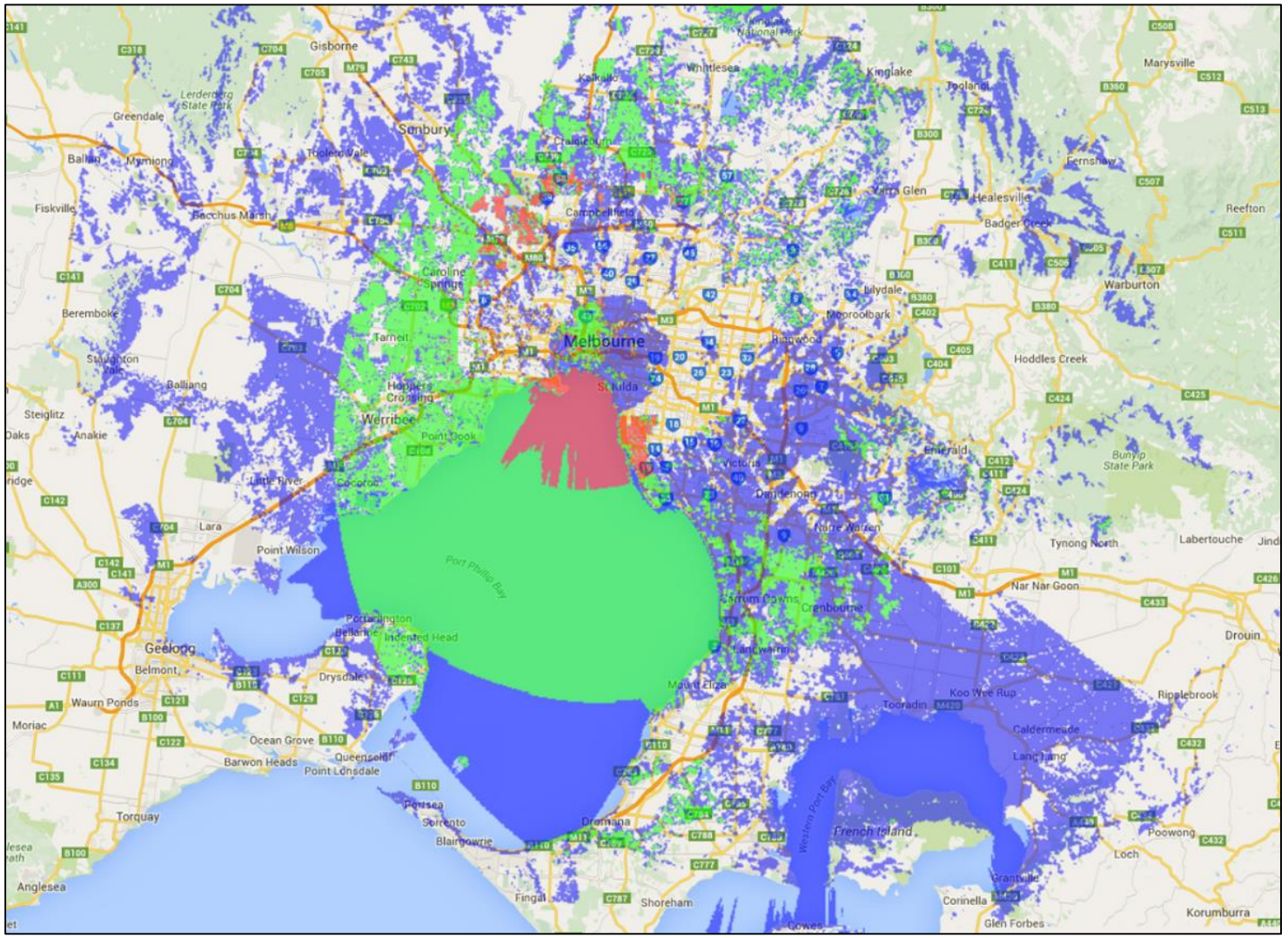
Regulations:

- Uses ISM band (free spectrum) – AUS/NZ: 920.8MHz UL / 922.3MHz DL (Ultranarrow band)
- Divided into 4 regions:



[4]

Sigfox – Coverage in Melbourne



1 Base Station

2 Base Stations

3 Base Stations and more

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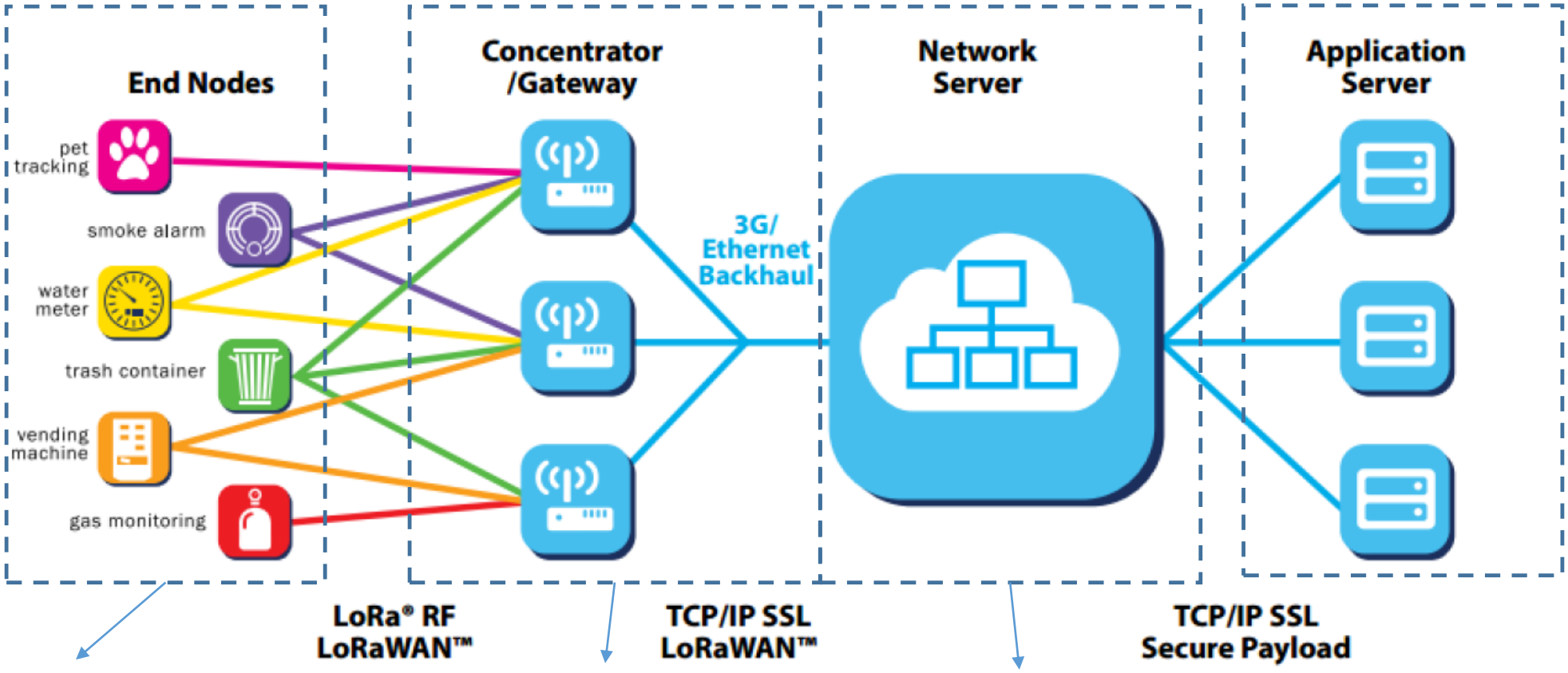
LPWAN (Low Power Wide Area Network)

LoRaWAN

LoRaWAN

Network Architecture:

3rd party or developed by the customer



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Any module or finished product based on Semtech chipset and compliant with LoRaWAN specs

Deployed by customer – option: **Kerlink Wirnet 923 or iBTS**

Kerlink has SPN software to run this, otherwise Kerlink runs an agent: LorIOT, Actility, The Things Network, etc

Capacity:

Data

- Up to 242 bytes when using fastest data rate

Range

- 15 km rural areas
- 2 km urban areas

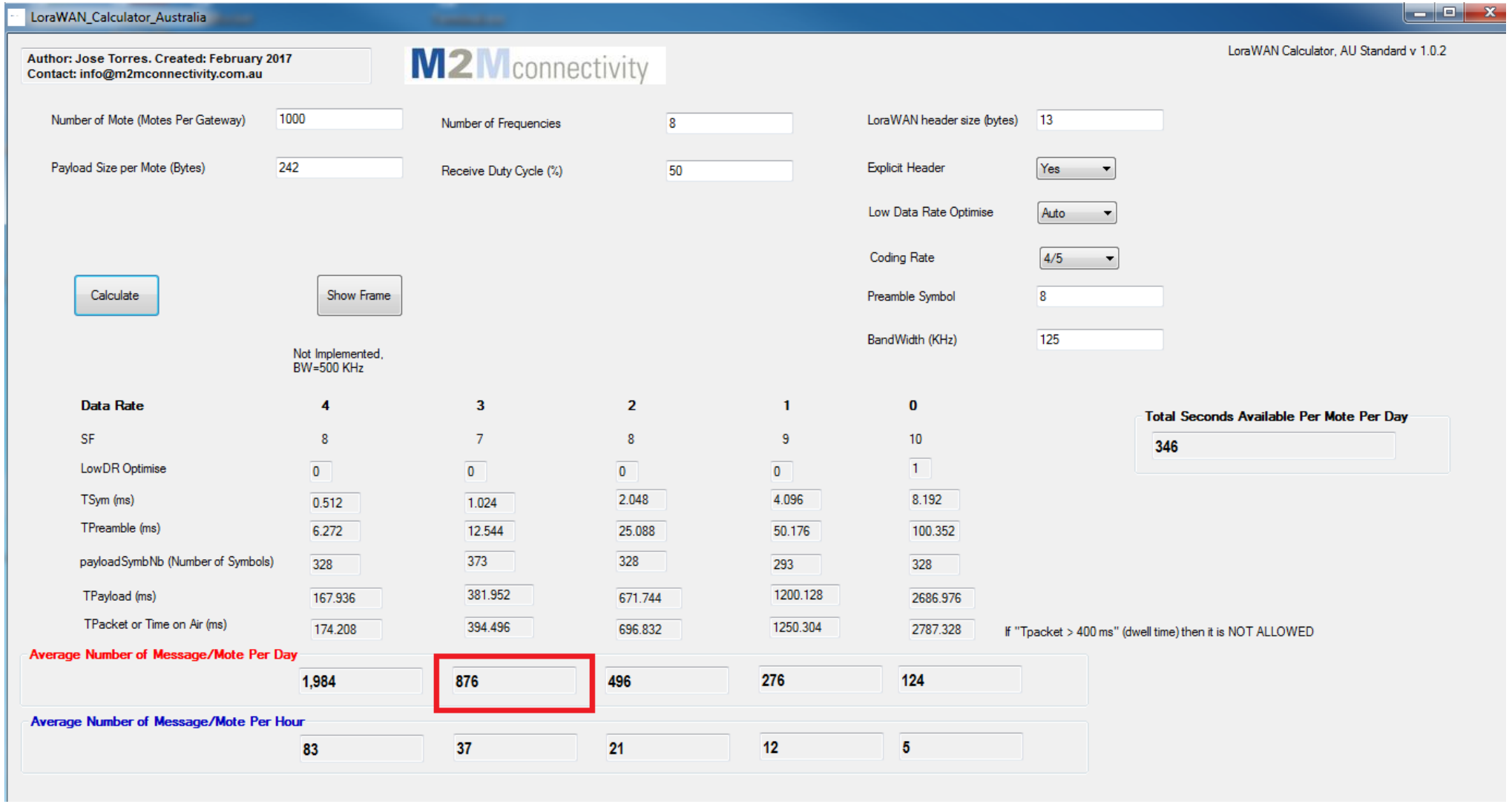
Number of messages

- It depends on #sensors, channels on the gateway, etc.

LoRaWAN

Example:

876 msg/day per sensor



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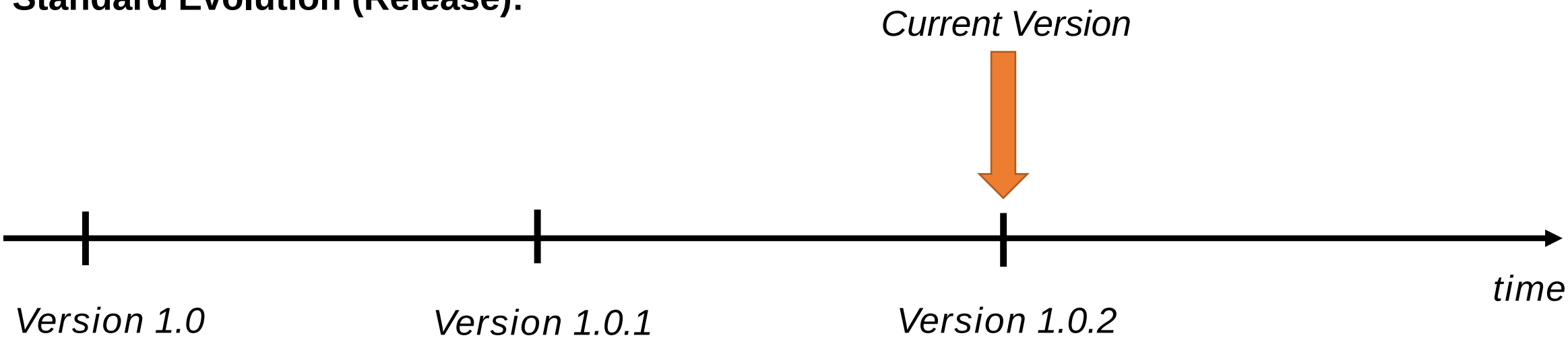
Standard Definition:

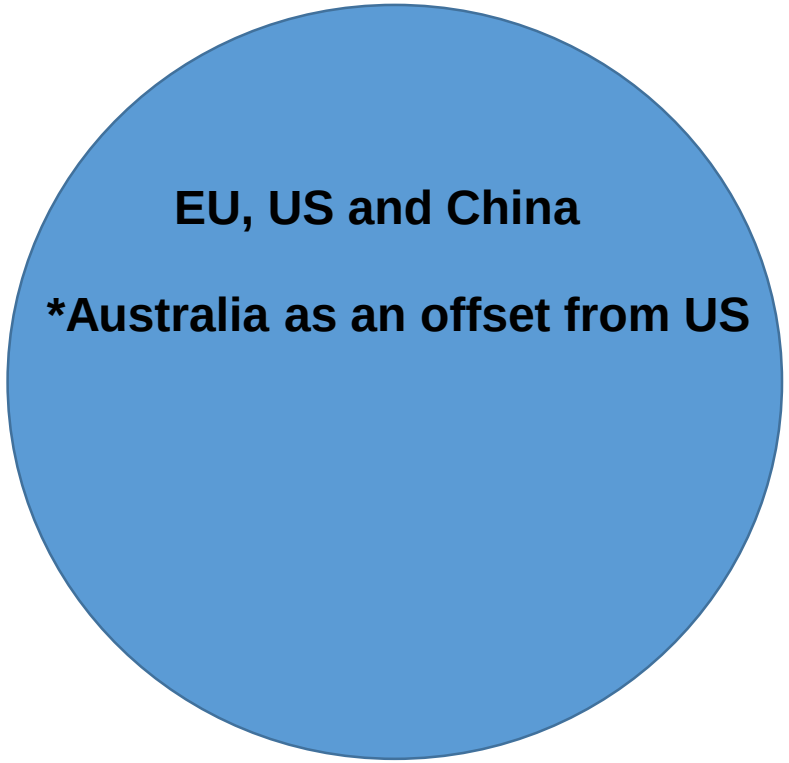
LoRa® Alliance

Standard Evolution (Release):

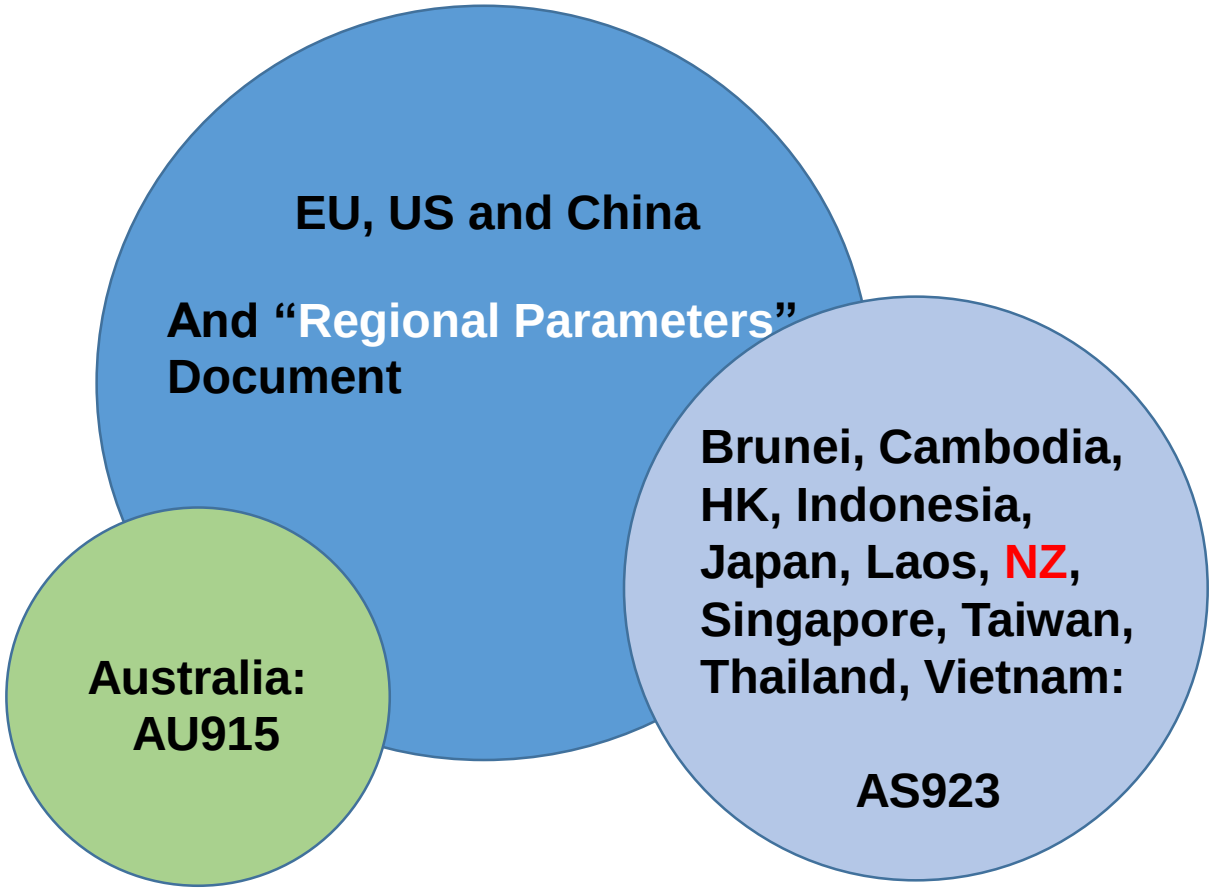


Standard Evolution (Release):

Version 1.0.1



Version 1.0.2



Live Demo

Contact: jose.torres@m2mconnectivity.com.au

M2M connectivity

Questions?

Contact: jose.torres@m2mconnectivity.com.au

References

[1] http://www.ensembletech.in/lpwan-conundrum-missing-piece-iot-puzzle/

[2] https://www.dreamstime.com

[3] http://www.newelectronics.co.uk/electronics-technology/lte-for-the-iot-not-one-standard-but-many/146360/

[4] http://www.thinxtra.com

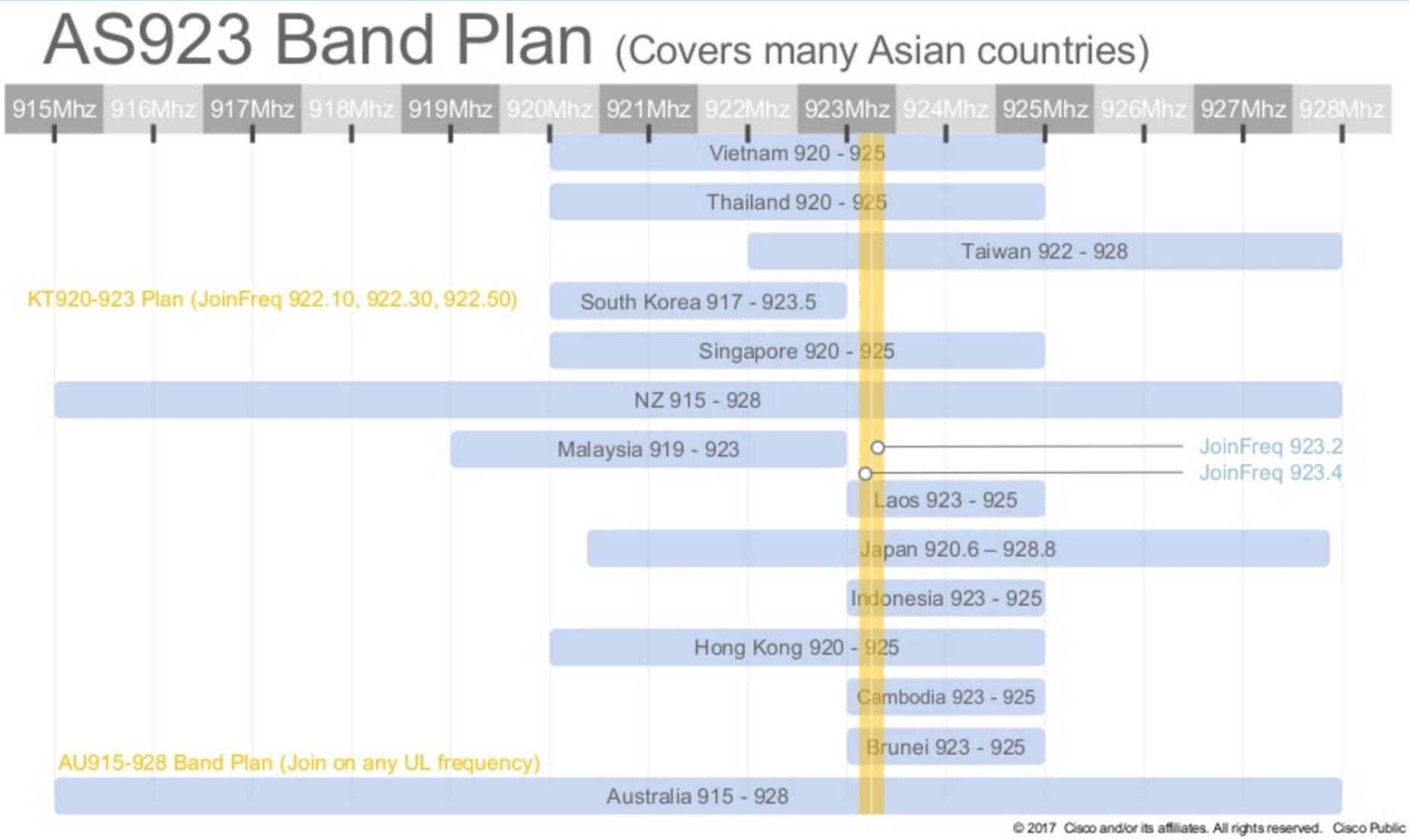
[5]http://www.semtech.com/wireless-rf/iot/LoRaWAN101_final.pdf

[6] http://www.m2mconnectivity.com.au/technologies/lorawan

[7] https://www.slideshare.net/apnic/lpwa-giving-a-voice-to-things

Appendix

Appendix – AS923 Further Explanation



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