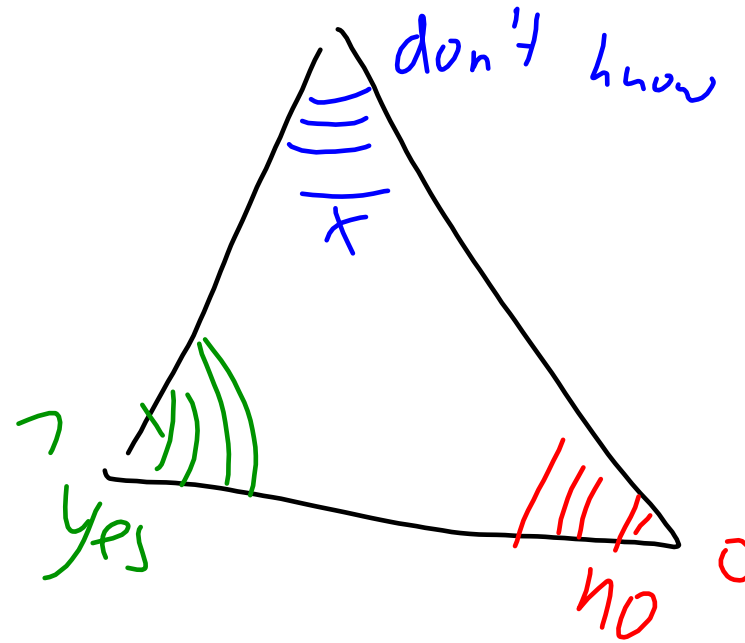


how to assess
sec & priv



2G

3G

4G

5G

Range:

previously

800/900 MHz
~15km 8-9km

700-2700 MHz
~3km (7-9km)

2600 MHz
~1km

20 GHz (30, 60 GHz)
~200-600m

BV

200kHz

3.8 MHz

7, 2.5, 70, 20 MHz

4G+ 40 MHz

1 GHz

2017++

Refarming

12G 5G IoT 900MHz 4G (5MHz)

~~3G~~ 4G

4G

5G



Collector

868 MHz

433 MHz
BW: 7.74

$$dB_m = 10 \log \frac{P}{[mW]}$$

100mW = 20dBm

100 mW = 7.52 mW LTE

Smart Grid

bandwidth

(5 MHz) 3 MHz, 0.6 MHz, 0.25 MHz

433.050 MHz

434.790 MHz BT

Wifi

3G

LTE

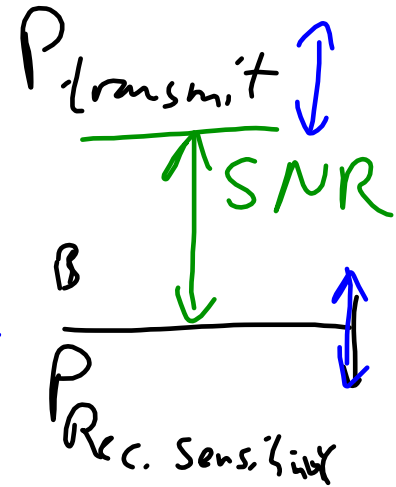
P_{sens}

-85 dBm

-80... -95 dBm

-106 dBm

-114 dBm



Sensitivity

Législation Française (et Européenne) sur la bande dite des 868MHz

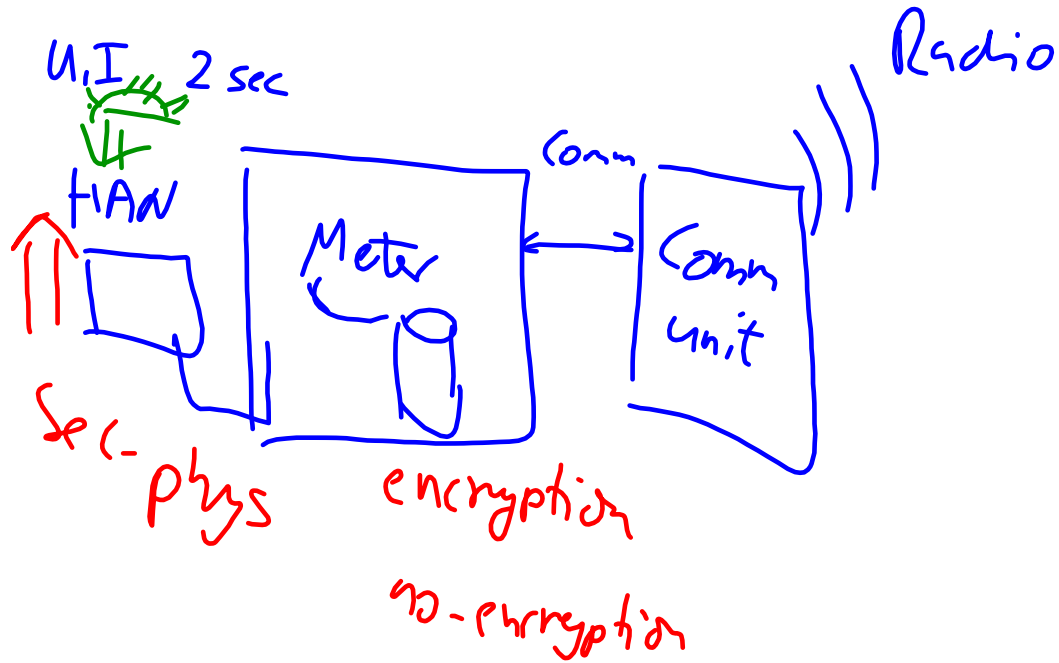
865Mhz-870 Hz



La réglementation est régie par différents textes, au niveau Européen l'ERC-REC-70-03E et en France par la décision de l'ARCEP 2012-0612 et 2014-1263 publiée au JORF le 30/01/2015.

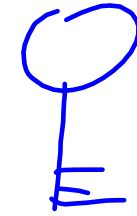
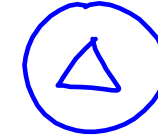
Le coefficient d'utilisation limite est défini comme étant le rapport de temps, sur 1 heure, durant lequel un dispositif émet effectivement dans la bande de fréquence concernée.

Smart Meter



phys.

lock



Operator enabled

- ensil

- phase



When / if

Group work

- HAN Port

- remote control

vs autonomous control

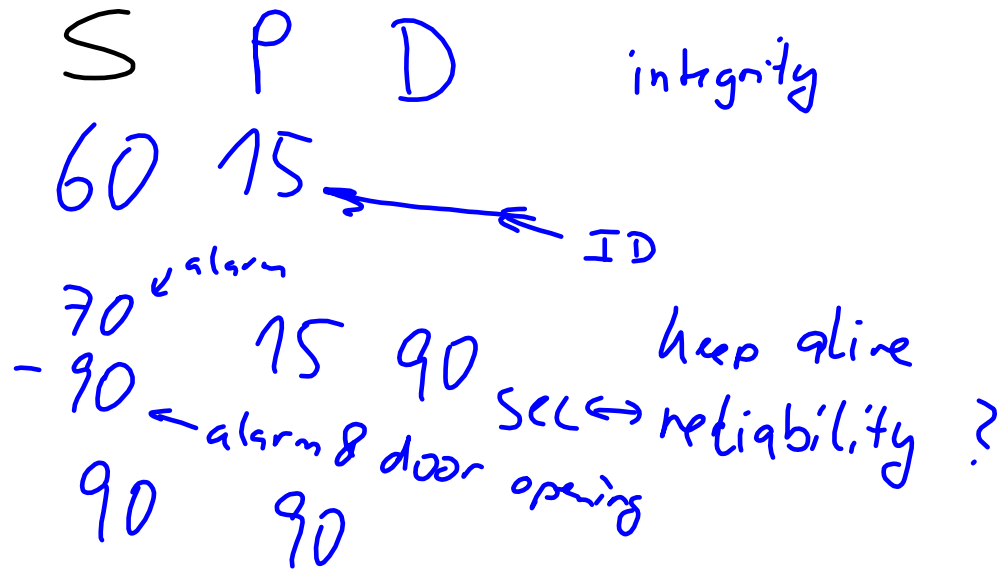


Billing

Fire alarm

Home control

- L Read
- L Switch
- L configure



$$Sec = 100 - Criticality$$

high weighting:

- remote access
- authentication
- encryption

$$C = \sqrt{\sum \frac{x_i^2 \cdot w_i}{\sum w_i}}$$

$$w_i = \left(\frac{w_i}{100}\right)^2$$

weights: 70, 20, 30
: 80, 85, 90

$$w_i = 70$$

$$0.07$$

$$w_i = 90$$

$$0.81$$

high sec $S_1 = 90$

	1 R	2	3	4	5	3	6	3
Req	Ant	enc	nrsh	rate	enc	mob	enc	
off	n.a.	on	off	low	on	SMS	on	
70	70	70	30	20	70	40	70	
70	80	80	60	80	40	70	40	
w_i	0.49	0.64	0.64	0.36	0.64	0.16	0.49	0.16
Σ								

$$0.1 = \sqrt{0.01}$$

$$S_1 = 0.9$$

$$S_2 = 0.77$$

$$S_3 = 0.65$$

$$0.01 \left(\frac{0.49 + 0.01 \cdot 0.64 + 0.01 \cdot 0.64}{7.77} \right)$$

$$S_3 = \frac{0.16 \cdot 0.49 + 0.01 \cdot 0.16}{0.65}$$

$C_{S3} = 40$

$$\frac{0.09 \cdot 0.36 + 0.04 \cdot 0.64}{7.16} + 0.01 \cdot 0.16$$

$$0.0324 + 0.0256 + 0.0016$$

$$\leftarrow 0.23$$

$$\sqrt{\frac{0.06}{7.16}}$$

	S1	S2	S3	best \Rightarrow	System
C_s	0.1^2	0.23	0.35	Sec	90
W_i	80	50	20	AMR	77
	0.64	0.25	0.04		Radio
				$= \sum$	65
					Mob

$$0.01 \cdot 0.64 + 0.23^2 \cdot 0.25 + 0.35^2 \cdot 0.04$$

$$\frac{0.0064 + 0.013225 + 0.0049}{0.93} \approx \frac{0.024525}{0.93} \approx \sqrt{0.026} = C_s \cdot 0.16$$

