

3 SCENARI APPLICATIVI ABILITATI DA IoT PER GLI AMBIENTI DI VITA

WEBINAR

21 LUGLIO 2022

11.00 - 13.00



Posizionamento preciso delle persone e degli asset tramite UWB

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Proietti Tech SRL



Chi siamo

Proietti Tech - Ascoli Piceno

- Nata nel 1970
- opera in diverse parti del mondo
- sede principale ad Ascoli Piceno, con oltre 1.400 mq. di uffici

I principali ambiti applicativi in cui operiamo sono:

- Rilevazione Presenze e Gestione Risorse Umane
- Controllo Accessi e Sicurezza
- Automazione e logistica
- Gestione dei Servizi Scolastici



Progetto MIRACLE

Ambito del progetto: Hardware

UWB - basta sul chip DW1000 di DecaWave

Il chip è Ultra Wideband con precisione nell'ordine di 10cm

A differenza delle tecnologie radio come Bluetooth o Wi-Fi, l'UWB funziona con il Time of Flight del segnale piuttosto che con RSSI (Received Signal Strength Indication)

Questo rende la tecnologia molto più precisa

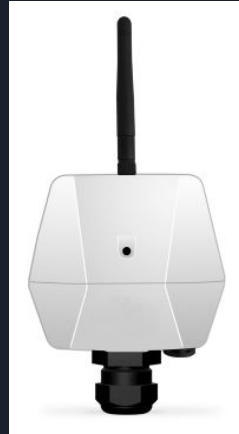
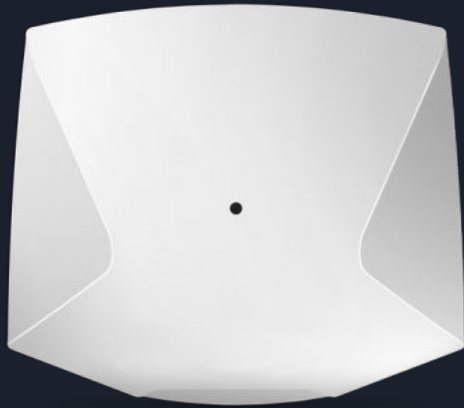
Progetto MIRACLE

Confronti

Technology	Identification	Accuracy	Presence Detection	Positioning type	Power Consumption	Range [m]	Disadvantages
Ultra Wideband	✓	cm - dm	✓	Absolute	Low	1 - 50	Signals can be blocked by large metallic objects
Wi-Fi	✓	m	✓	Absolute	High	1 - 50	Use of ISM band - interference
Bluetooth	✓	m	✓	Absolute	Low	1 - 20	Use of ISM band - interference, low range
RFID	✓	dm - m	✓	Absolute	Low	1 - 50	Low range and small coverage, unsecure communication
Camera	✗	mm - dm	✓	Absolute	High	1 - 10	Requires big computing power, requires Line of Sight
Laser	✗	mm	✓	Relative	High	1 - 5	Requires direct Line of Sight, provides only relative positioning
Infrared	✗	m	✓	Absolute	Low	1 - 5	Requires direct Line of Sight, can be easily blocked by opaque objects
Ultra Sound	✗	cm	✓	Absolute	Low	1 - 10	Susceptible to acoustic noise
Dead Reckoning	✗	0.1% - 20% ratio	✗	Relative	High	1 - 100	The positioning error cumulatively increases, need to use high quality sensors, only relative positioning available
Pseudolites	✓	cm - dm	✗	Absolute	High	1 - 1000	Affected by multipath, signal interference and less accurate clock

Progetto MIRACLE

Ancore



Tag



Specifiche

Size	170 x 96 x 45	212 x 190 x 36
Weight	150 g	390 g
Operating Conditions	-20° - 60 °C	-20° - 60 °C
Warm-up Time	Immediate	Immediate
UWB Antenna	Omnidirectional	High-gain Directional
Passive PoE 48V	✓	✓
Active PoE IEEE 802.3af, Cisco Compatible	✓	✓
Battery Power Supply	PoE Power Bank	PoE Power Bank
Ethernet Backhaul	✓	✓
WiFi Backhaul	Optional	Optional
Remote LED Identification	✓	✓
Barometer	✓	✓
Clock Type	TCXO	TCXO
Enclosure	IP65	IP65

Progetto MIRACLE

Ambito del progetto: SOFTWARE

Configuratore dei dispositivi

IP RANGE From: 192 . 168 . 225 . 10 To: 192 . 168 . 225 . 254 RESCAN ANCHORS

UWB Profiles TDMA Status TDMA Protocol UDP Network

Last updated: 11: 45: 45

Anchors Summary

#	Anchor Mac	Update <small>clickable</small>	Alias <small>editable</small>	Status	IP	FW	Product Name	HW	Uptime <small>[d, h:ms]</small>	LED <small>clickable</small>	Localization Mode	Master	Sync Profile	Sync Channel	Blink Profile	Blink Channel	Power
	All Anchors	UPDATE ALL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	skip	skip	skip	skip	skip	skip	skip
1	049162c93147	UPDATE	Sala riunioni Adx	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.110	3.1.7-OEM-B1	N/A	1.6r0-OL	37, 21:27:45	TURN ON	True Location	No	RF 1	5	RF 5	5	compliant
2	801f1254a7c8	UPDATE	Sala riunioni Asx	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.118	3.1.7-OEM-B1	N/A	1.6r0-O	37, 21:27:29	TURN ON	True Location	No	RF 1	5	RF 5	5	compliant
3	049162c0e833	UPDATE	Sala riunioni Bsx	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.111	3.1.7-OEM-B1	N/A	1.6r0-OL	37, 21:27:36	TURN ON	True Location	No	RF 1	5	RF 5	5	compliant
4	801f1254b29a	UPDATE	Sala riunioni Bxx	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.117	3.1.7-OEM-B1	N/A	1.6r0-O	37, 21:27:20	TURN ON	True Location	Yes	RF 1	5	RF 5	5	compliant
5	801f12563895	UPDATE	Piano uffici - area stampanti	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.114	3.1.7-B0	N/A	1.6r0-D5	7, 01:21:12	TURN ON	True Location	Yes	RF 1	5	RF 5	5	region-default/cu
6	801f1255cb4a	UPDATE	Piano uffici - area Direzione	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.115	3.1.7-B0	N/A	1.6r0-D5	7, 01:21:12	TURN ON	True Location	No	RF 1	5	RF 5	5	region-default/cu
7	801f12569128	UPDATE	Sala riunioni Bdx	<input checked="" type="checkbox"/> <input type="checkbox"/>	192.168.225.116	3.009	N/A	1.6r0-D5	34, 00:26:07	TURN ON	True Location	No	RF 1	5	RF 5	5	region-default/cu



Progetto MIRACLE

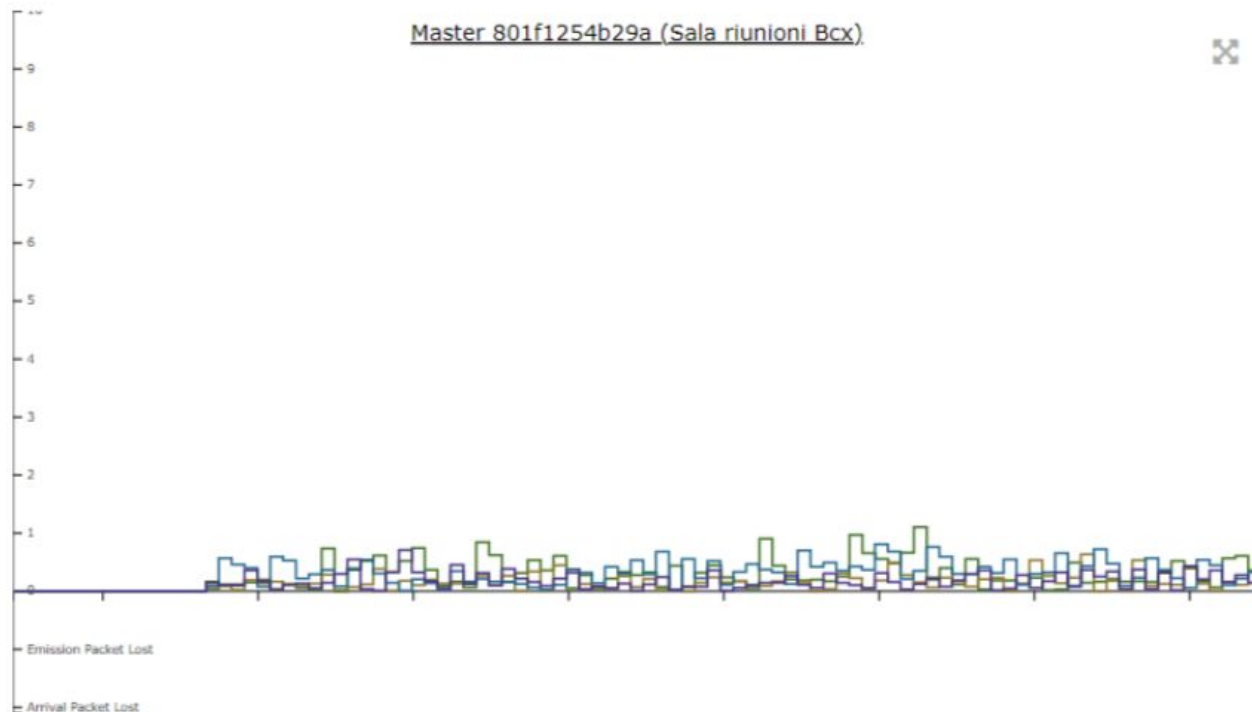
Graph metric for Master UWB Sync stability

801f1254b29a (Sala riunioni Bcx) 2nd Difference START STOP

Master 801f1254b29a (Sala riunioni Bcx)



TOGGLE ALL APPLY ANCHOR RESTRICTIONS
< 15 METERS < 20 METERS < 30 METERS



Master (801f1254b29a) packets lost: 0

- 049162c8e833 (Sala riunioni Bsx), packets lost: 0,
- 049162c93147 (Sala riunioni Adx), packets lost: 0,
- 801f12569128 (Sala riunioni Bdx), packets lost: 0,
- 801f1254a7c8 (Sala riunioni Asx), packets lost: 0,



Progetto MIRACLE

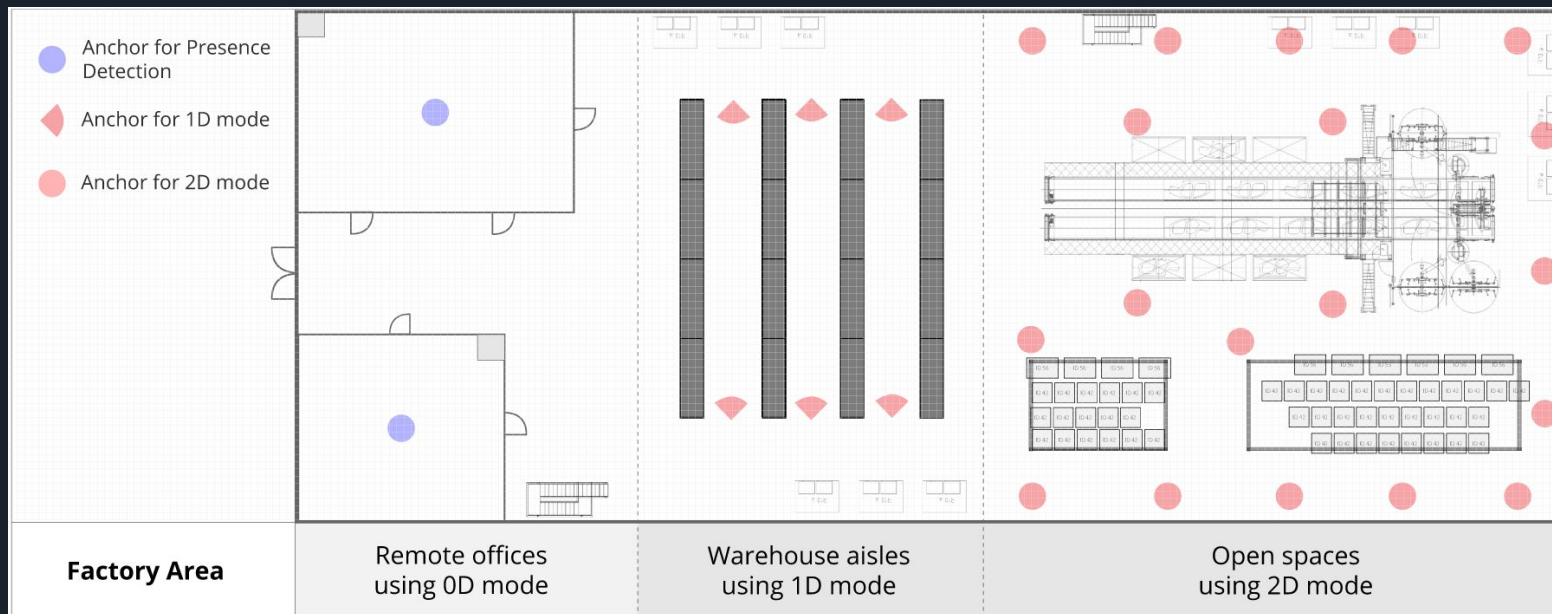
Tipologie di localizzazione

- 0D (Zero dimensional), chiamato anche “rilevamento presenza” (es. piccole stanze isolate)
- 1D (One dimensional), posizione determinata su un asse (es. corridoi)
- 2D (Two dimensional), posizione planare determinata su due assi

Progetto MIRACLE



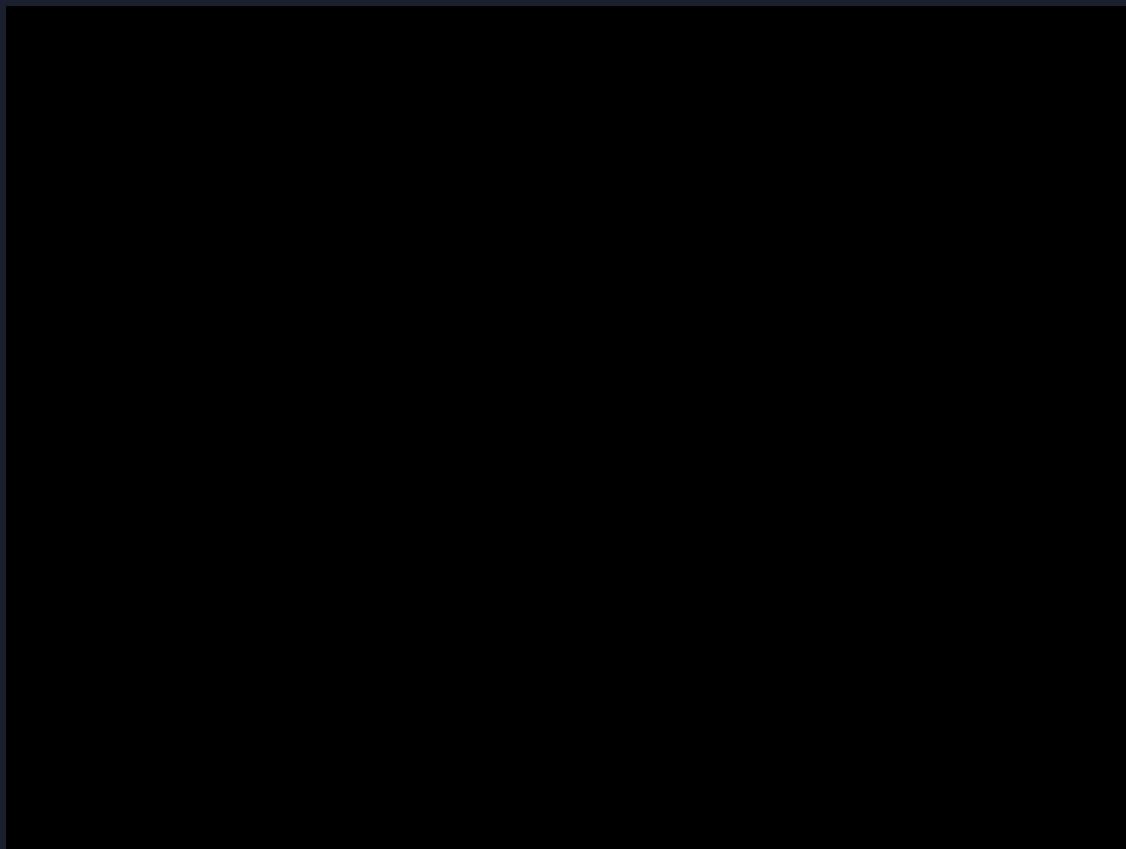
Tipologie di localizzazione





Test 1D

Test 2d





Grazie per l'attenzione