
Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Personal Broadcasting for Personal Space Communication]

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Re: [In response to 802.15 WNG call for presentations.]

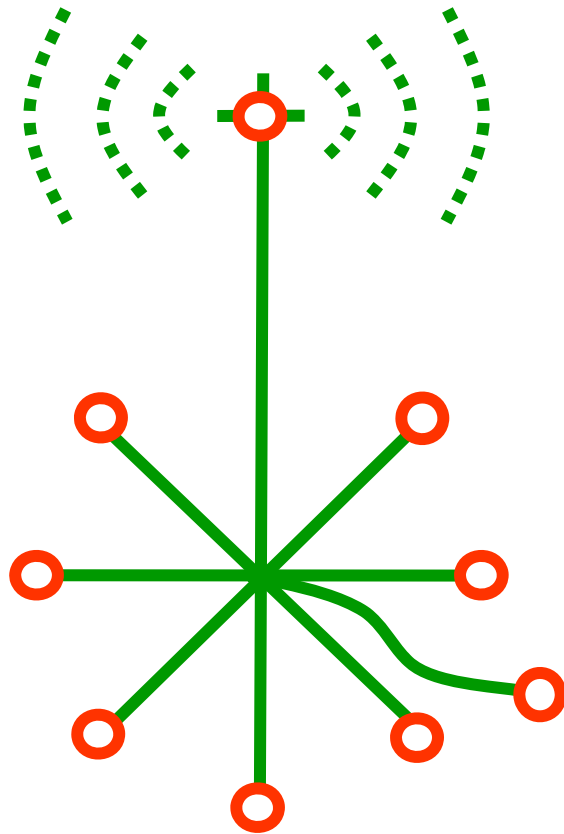
Abstract: [In 5G with mobile computing, power will shift from service providers to users, thus the personal space will be central, not peripheral, to the global communication. The 802.15 Personal Space Communication(PSC) will define technologies, among which broadcasting capability is one of the most essential. PSC devices are themselves personal broadcast stations and also act the role of radio which select the broadcasting services. The personal broadcast is similar to conventional broadcast, but has different features too. So we will explain these differences.]

Purpose: [[Information related to the request for international cooperation](#)]

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Personal Broadcasting for Personal Space Communication



May 2010

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PicoCast Forum

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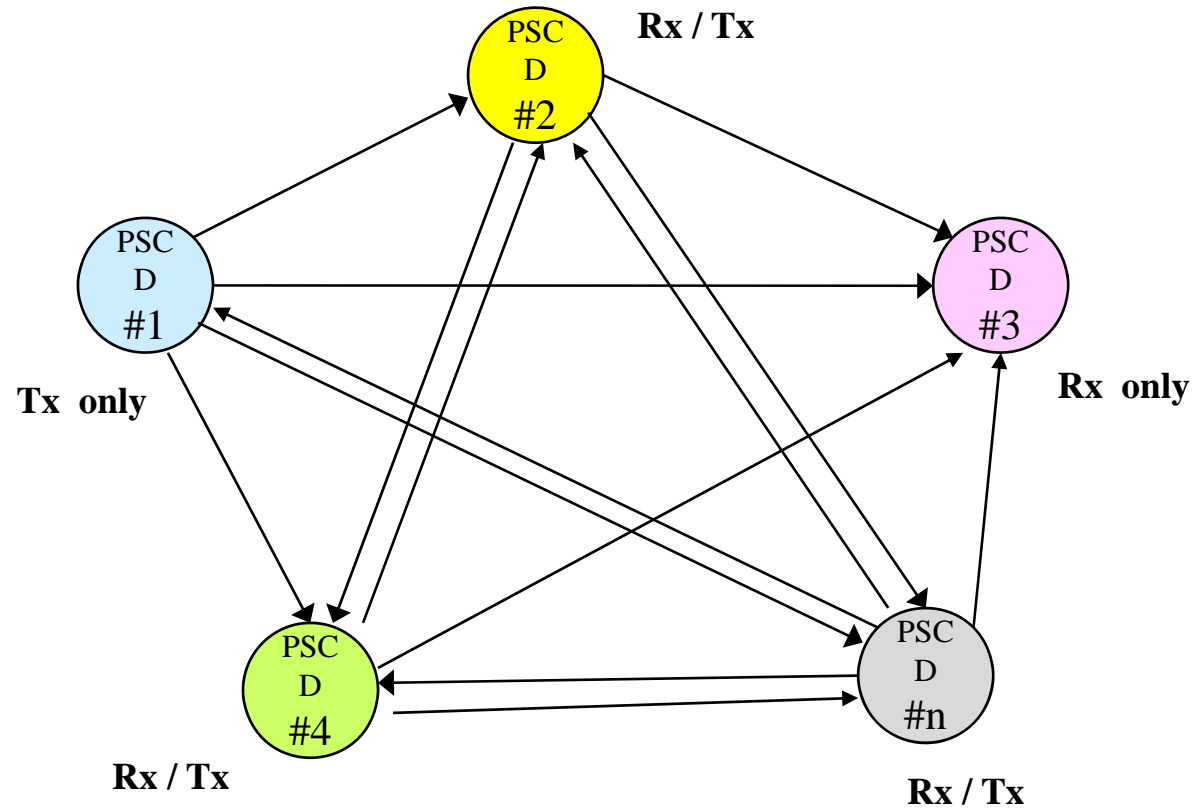
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Personal Broadcasting Concept

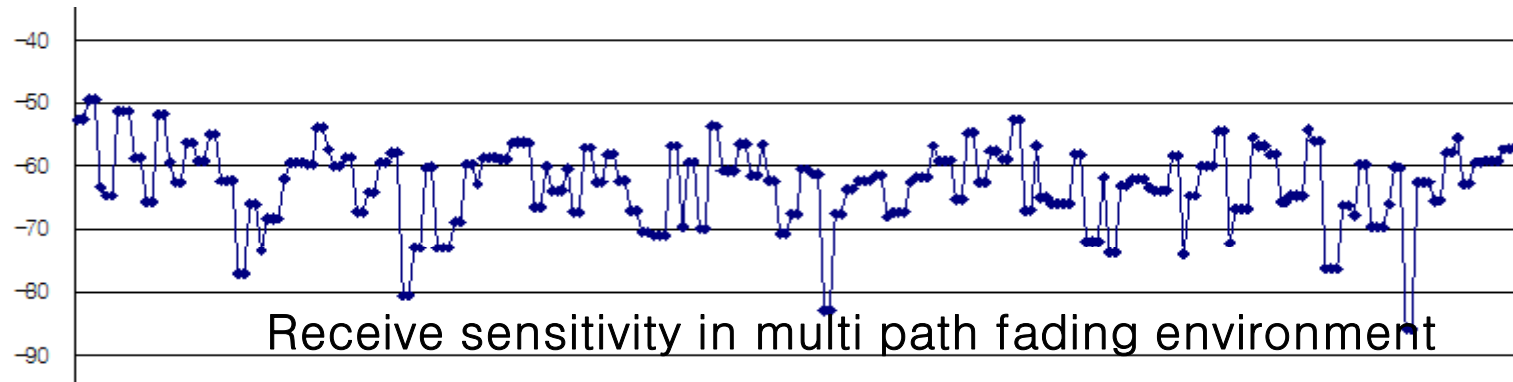
PSC devices play the broadcasting role and also the radio role to select the broadcasting services.



Requirements of Personal Broadcasting

Feature	Description	Remark
Latency	< 20msec	unaware
# of group members as radio	No limit	
# of broadcasting Station	# of available frequencies x # of divided time slots	
# of receiving multi channel	1 to n (n = # of divided time slots)	n is determined by required quality
# of group master	1	Synchronization reference

Ensure broadcasting performance without ARQ



of frame error / # of Sync loss

Test Path	Diversity Mode	Diversity Number				
		1	2	3	4	5
Case A 1 soft wall ~30m	Freq / Time	2700 / 329	106 / 2	9 / 0	1 / 0	0 / 0
	Time with f_1	3601 / 601	2487 / 303	2136 / 254	1945 / 237	1816 / 229
	Time with f_2	2361 / 422	1706 / 185	1457 / 135	1310 / 125	1215 / 111
Case B 2 soft wall ~30m	Freq / Time	8264 / 1272	3545 / 101	1536 / 8	637 / 0	480 / 0
	Time with f_1	4648 / 724	3416 / 424	2976 / 363	2750 / 332	2580 / 309
	Time with f_2	5640 / 961	4287 / 614	3749 / 514	3461 / 460	3280 / 418

Should use frequency / Time hybrid diversity algorithm ; **Frequency Hopping**

Comparison of Time & Frequency Diversity

Time Diversity

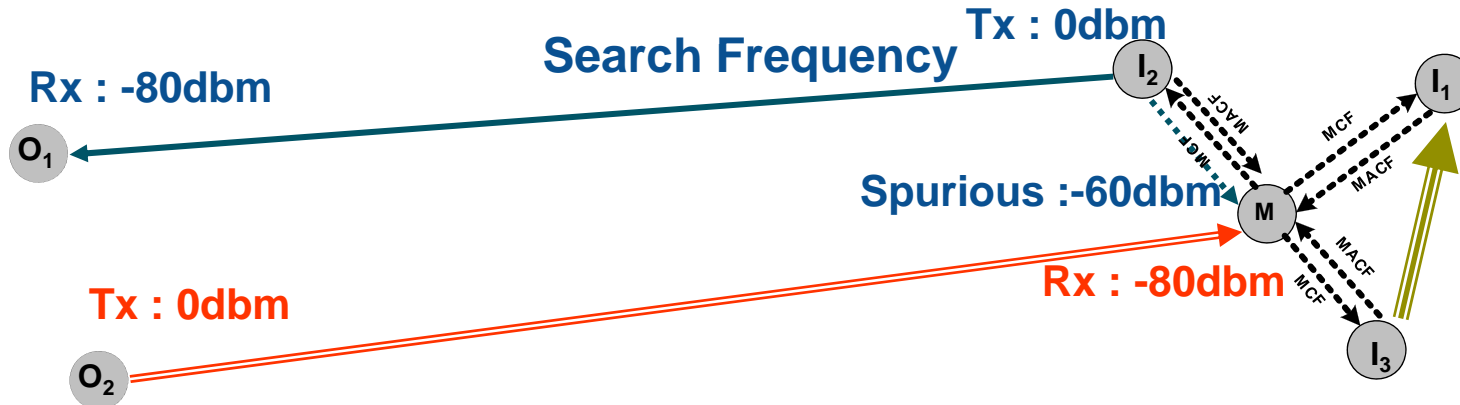
		t1	t2	t3	t4	t5	t6	t7	t8	T9
X	f1	x11	x12	x13	x21	x22	x23	x31	x32	x33
Y	f2	y11	y12	y13	y21	y22	y23	y31	y32	Y33
Z	f3	z11	z12	z13	z21	z22	z23	z31	z32	z33

Time / Frequency Hybrid Diversity

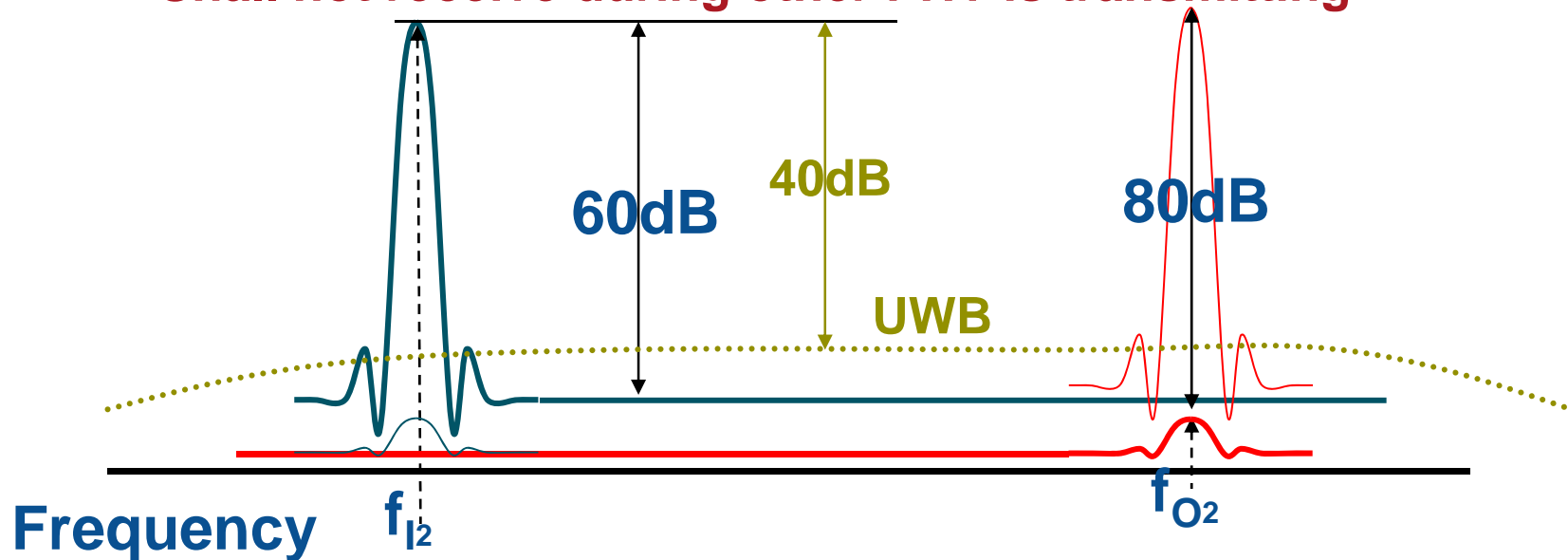
		t1	t2	t3	t4	t5	t6	t7	t8	T9
xzy	f1	x11	z12	y13	x21	Z22	y23	x31	z32	y33
yxz	f2	y11	x12	z13	y21	X22	Z23	y31	x32	z33
zyx	f3	z11	y12	x13	z21	Y22	x23	z31	y32	x33

Synchronization to Avoid mutual interference

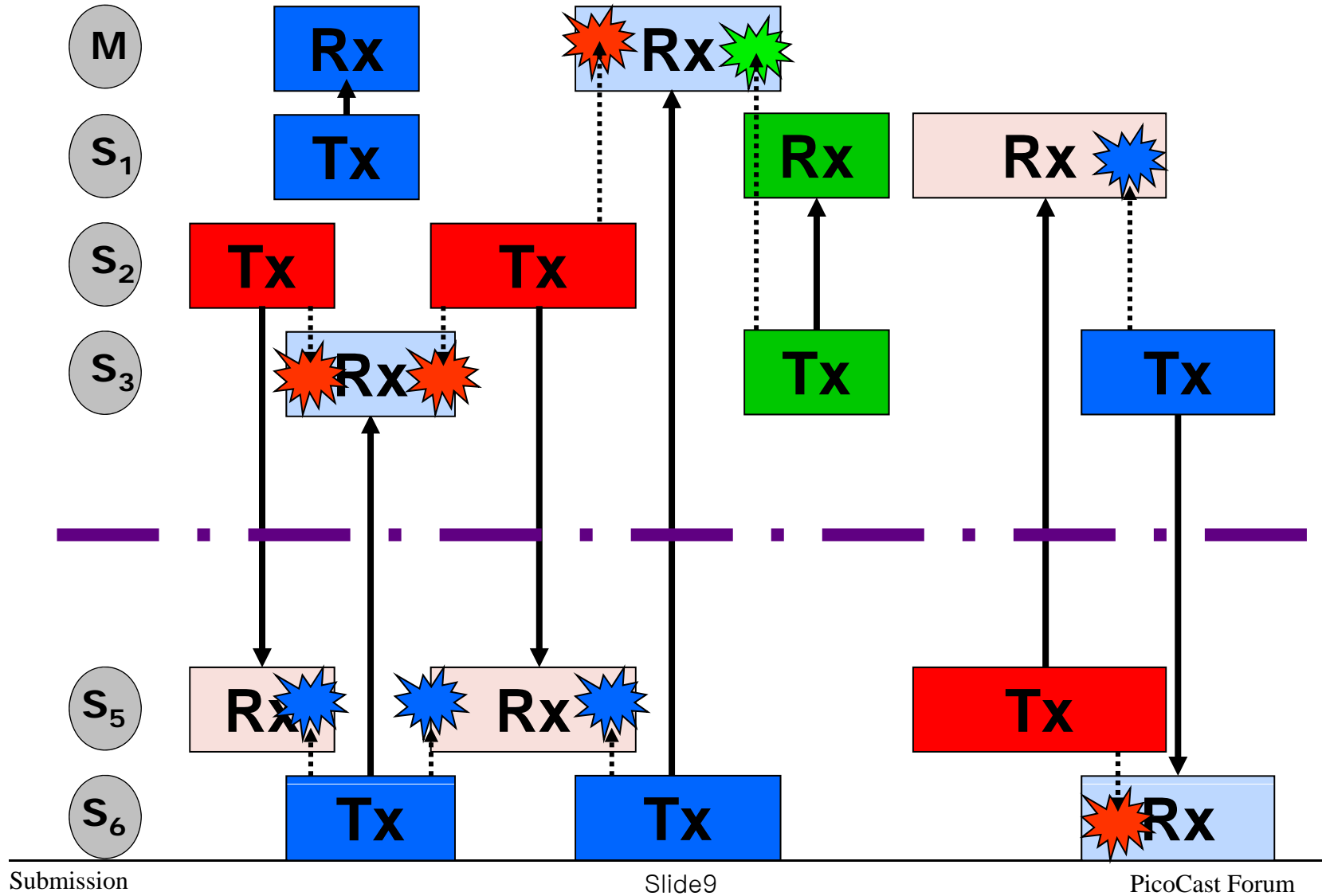
Near / Far Interference



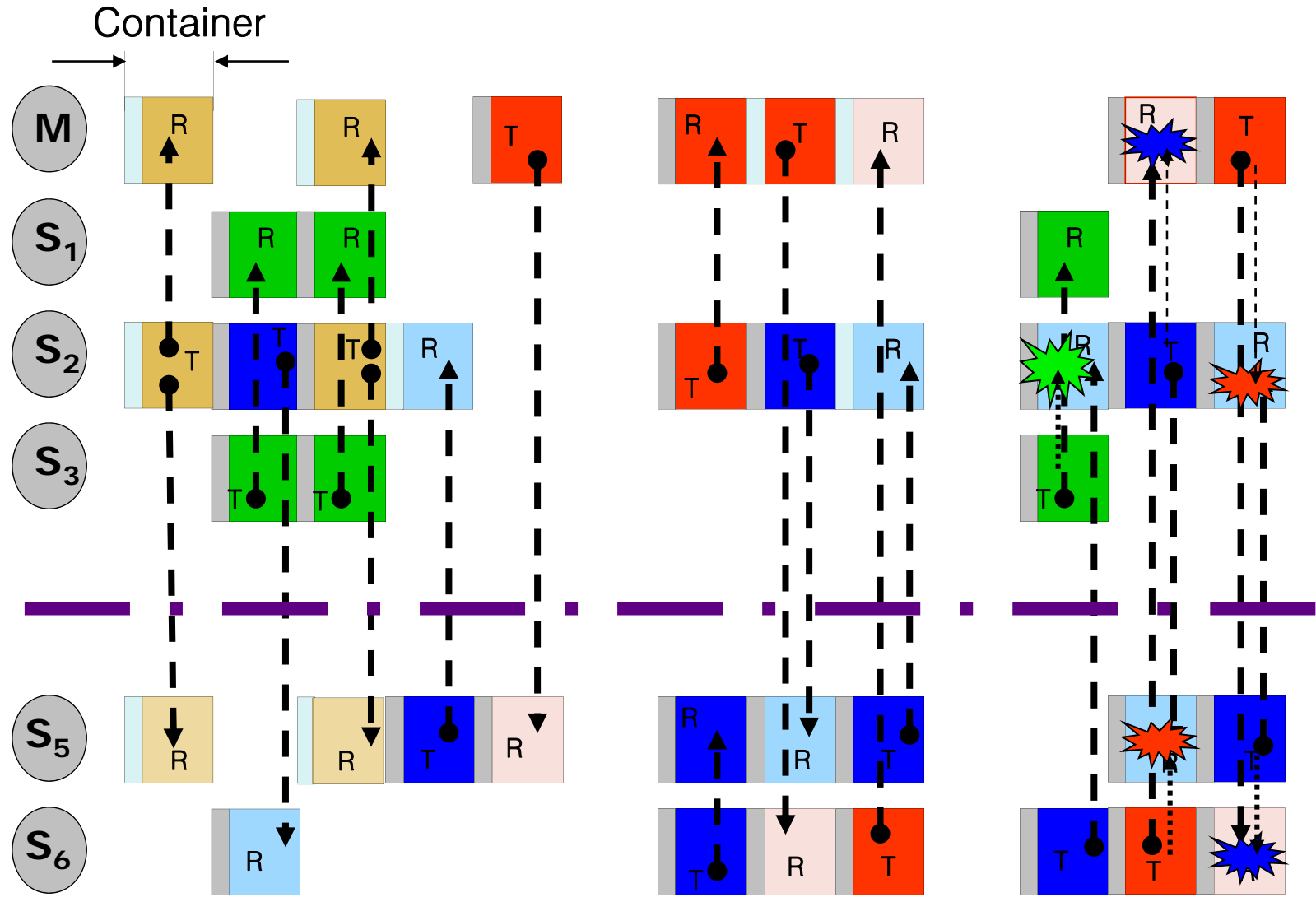
Shall not receive during other PHY is transmitting



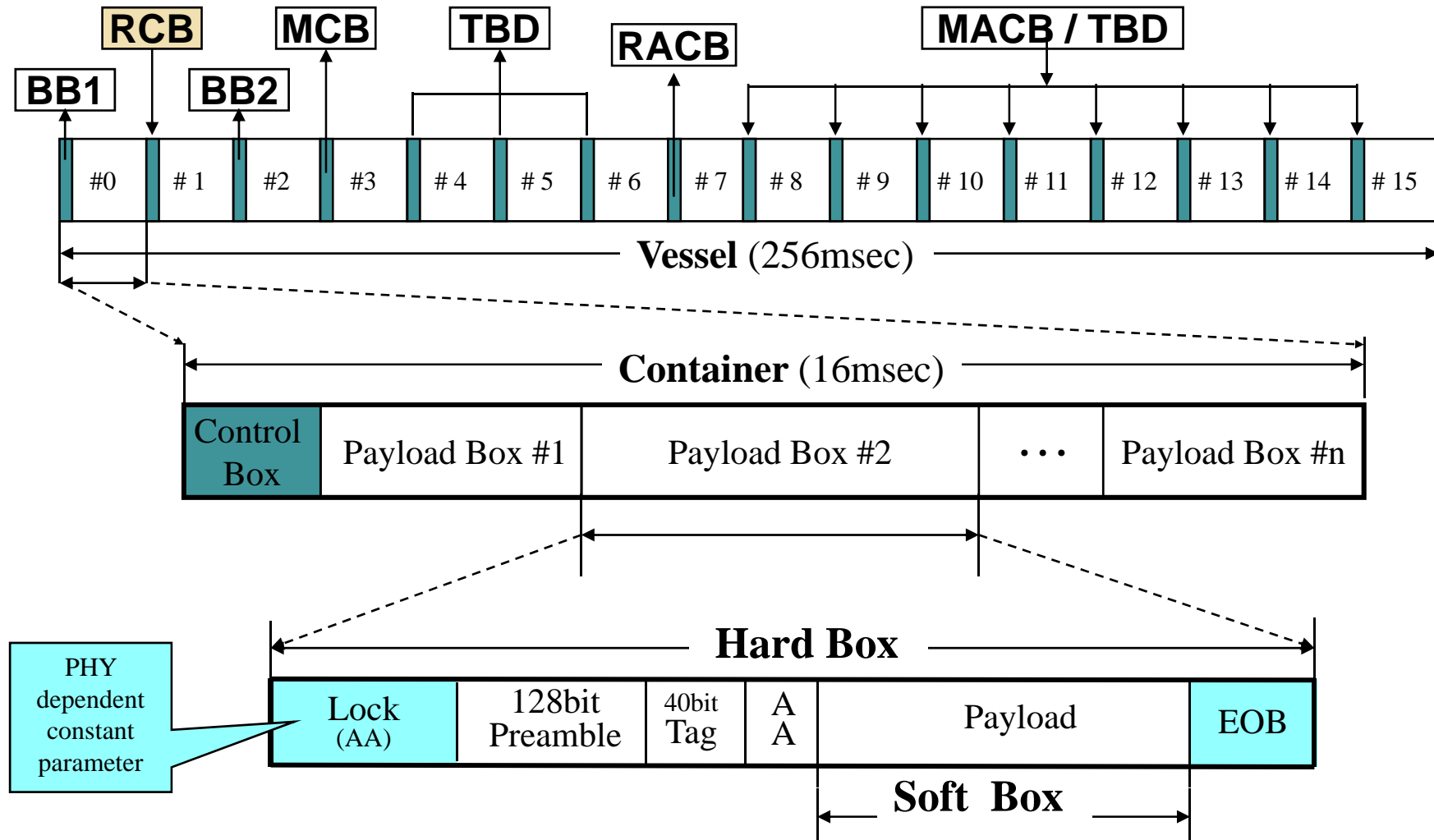
Mutual Interference of existing solution



Avoid mutual interference by synchronization

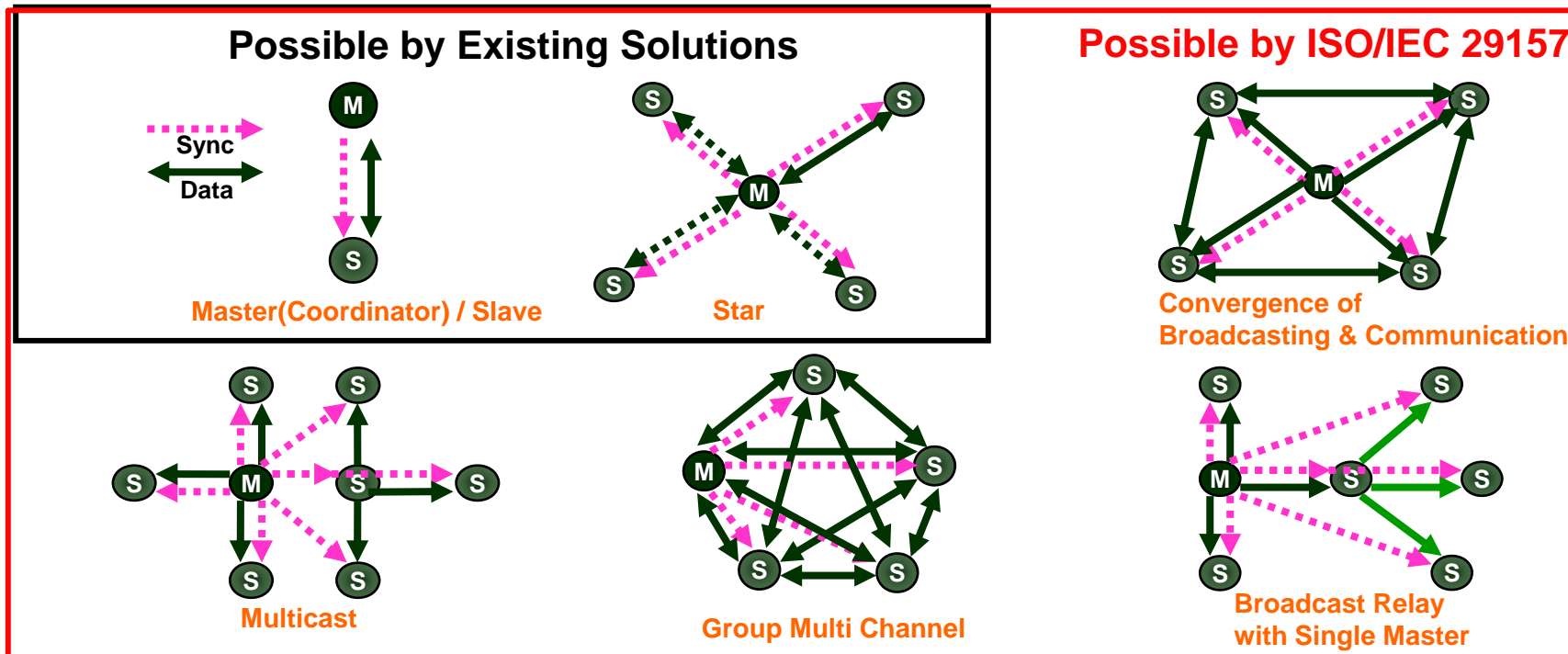


Synchronized Container Structure

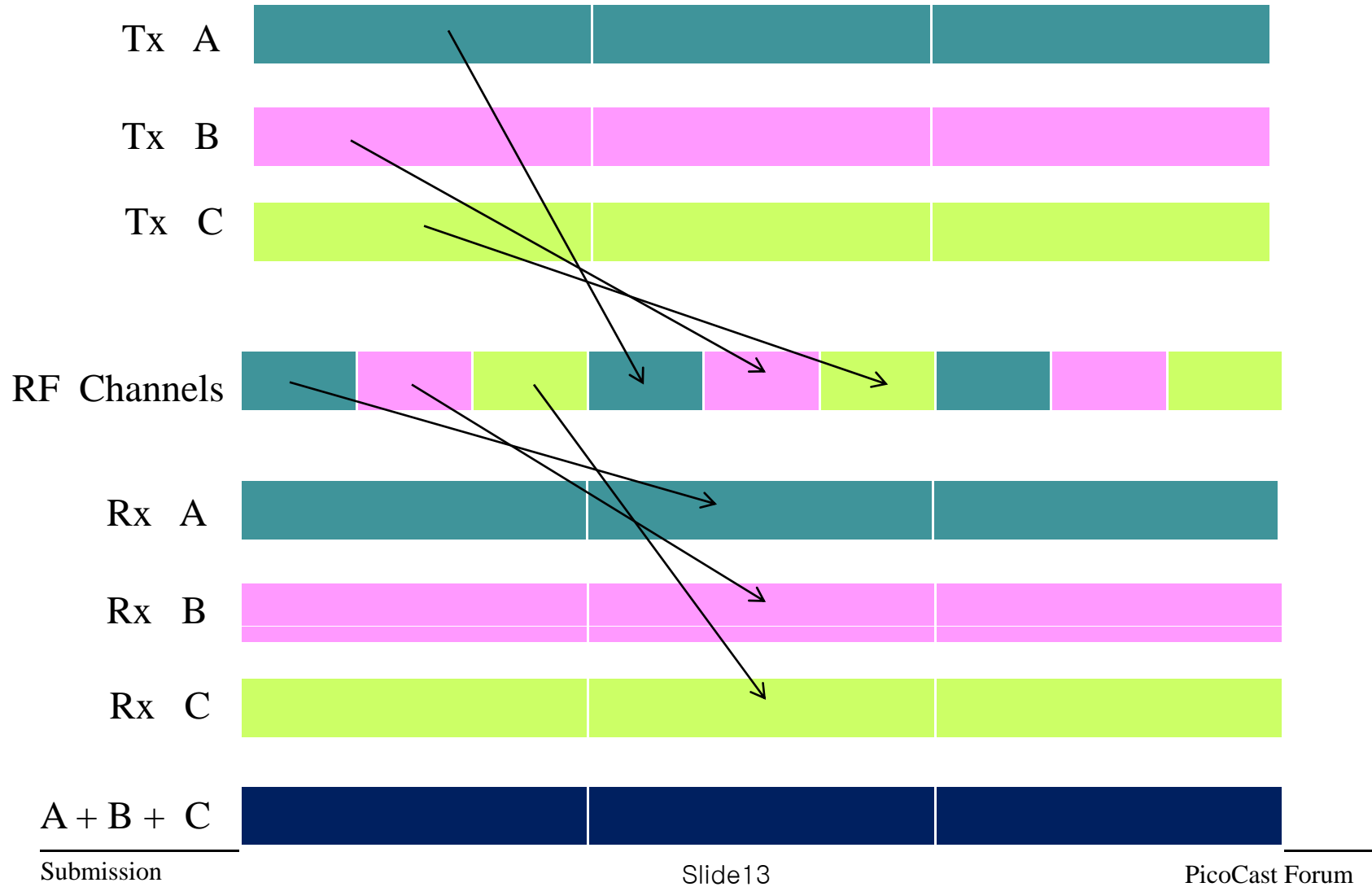


Roles of Master Station

1. Select best 16 frequencies & make hopping table
2. Transmit beacon containing hopping table
3. Assign transmit token to slaves



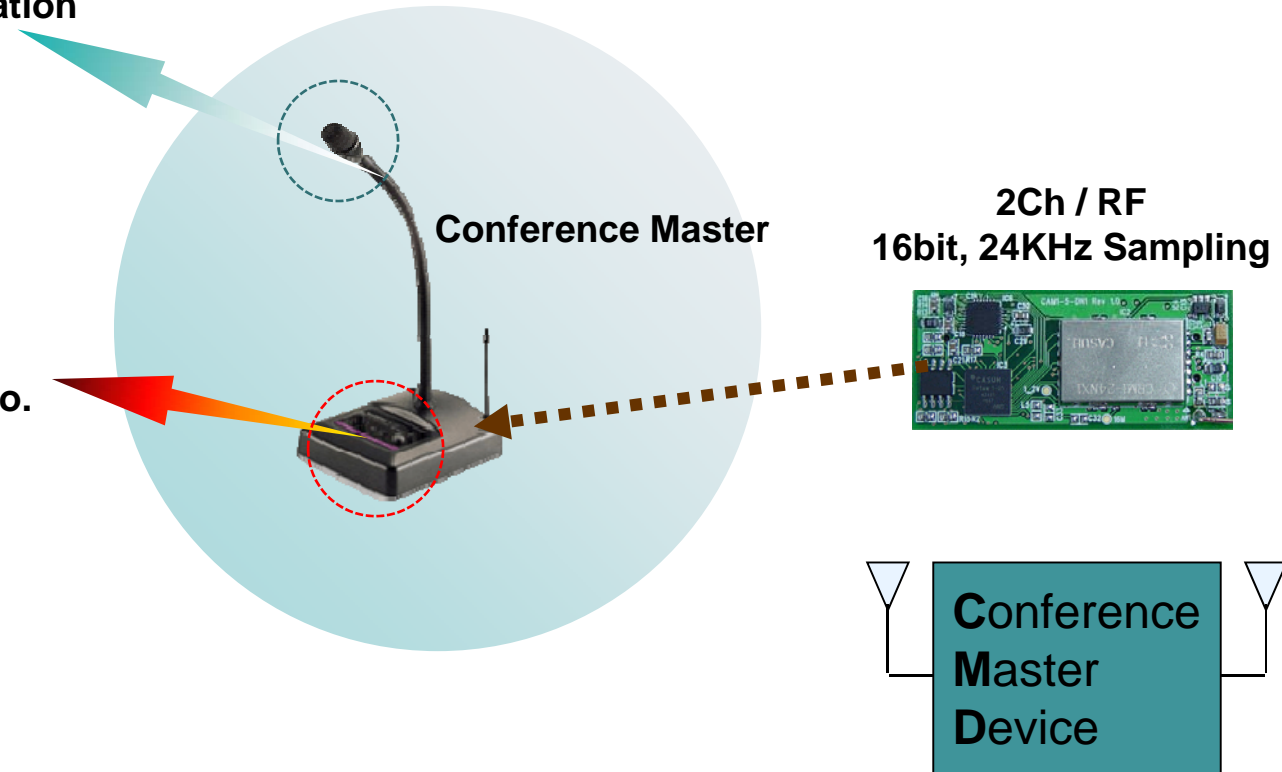
Time divided multiple channel transmit & receive



Wireless Conference System

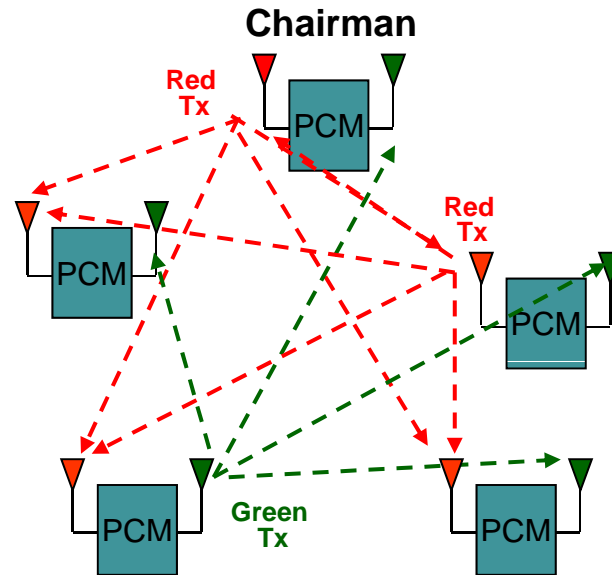
It's not a microphone.
Is a Broadcasting Station

It's not a speaker.
Is a 2 channel radio.



- Broadcasting among 16 channels
- Receive 2 channel simultaneously

Portable Conference Master

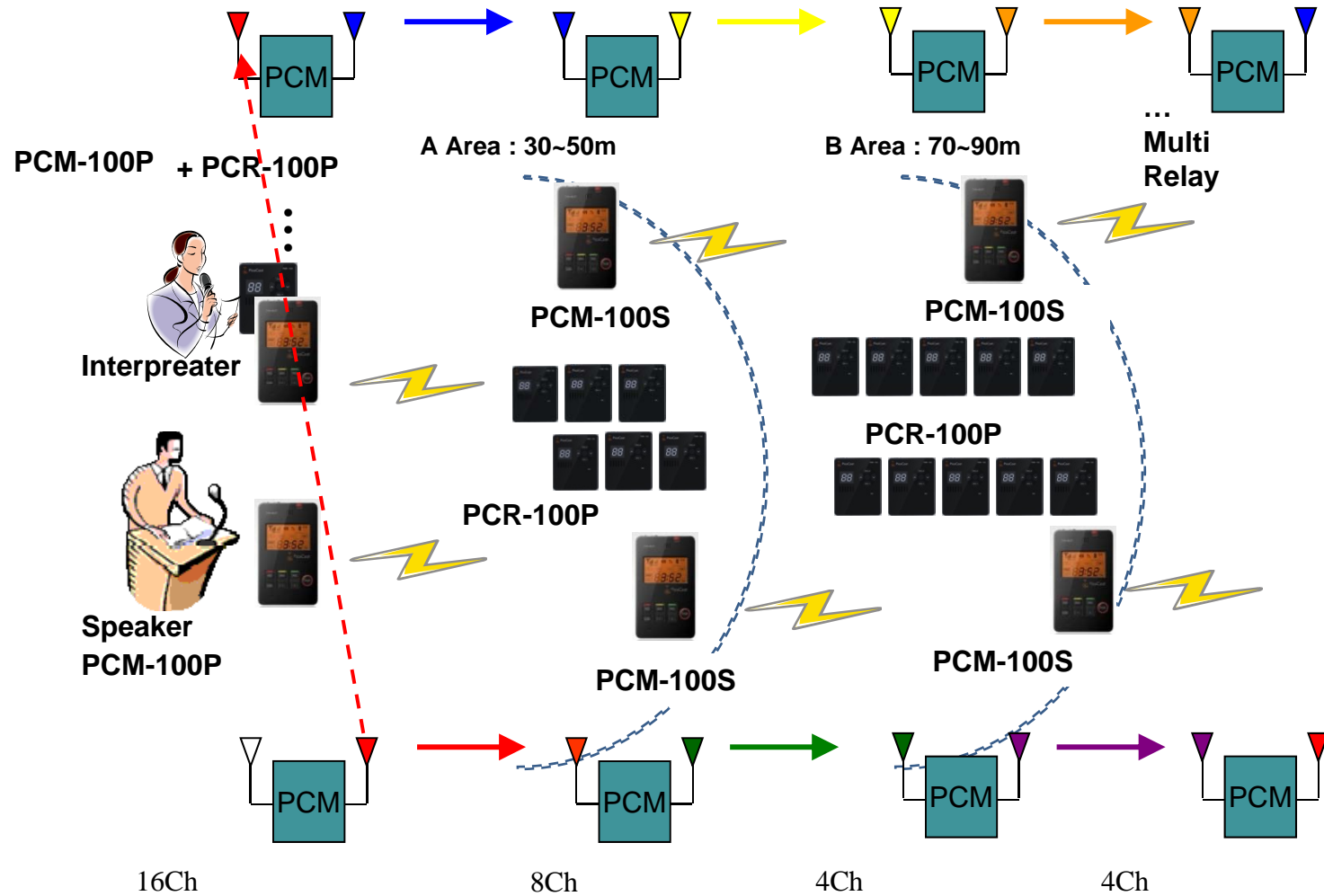


◆ Features ;

- ❖ Wireless Conference
- ❖ 2 Talkers Simultaneously
- ❖ Electric Voting (99 persons)
- ❖ Talking time limit
- ❖ Quit the Talking Device

- **Red & Green Ch Broadcasting**
- **Every PCM receives Red & Green Ch together**
- **Chairman broadcast Red Ch**
- **Every PCM share & Tx Green Ch**
- **If chairman quit Red Ch, other PCM shares Red Ch too.**

Multi Lingual Interpretation System



Paradigm Shift : 2-way Graphic Remote controller



WPAN Tomorrow

Personal Space for Communication, Broadcasting, Education and Entertainment



Sure, it is.
Let's enjoy
Karaoke...



Thanks, Grandpa.
"Smarterphone"
is also a
Karaoke.