

# Personal Space Communications

## Use cases and technical requirements

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

**Submission Title:** [PSC use cases & technical requirements]

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

**Abstract:** [Target application categories for the personal space communications have been explored with use cases, and technical requirements for each of the use cases have been identified. An implementation has been presented, and feasibility has been demonstrated through a series of service demos based on commercial products.]

**Purpose:** [To promote discussion within the PSC group of the target use cases and technical requirements]

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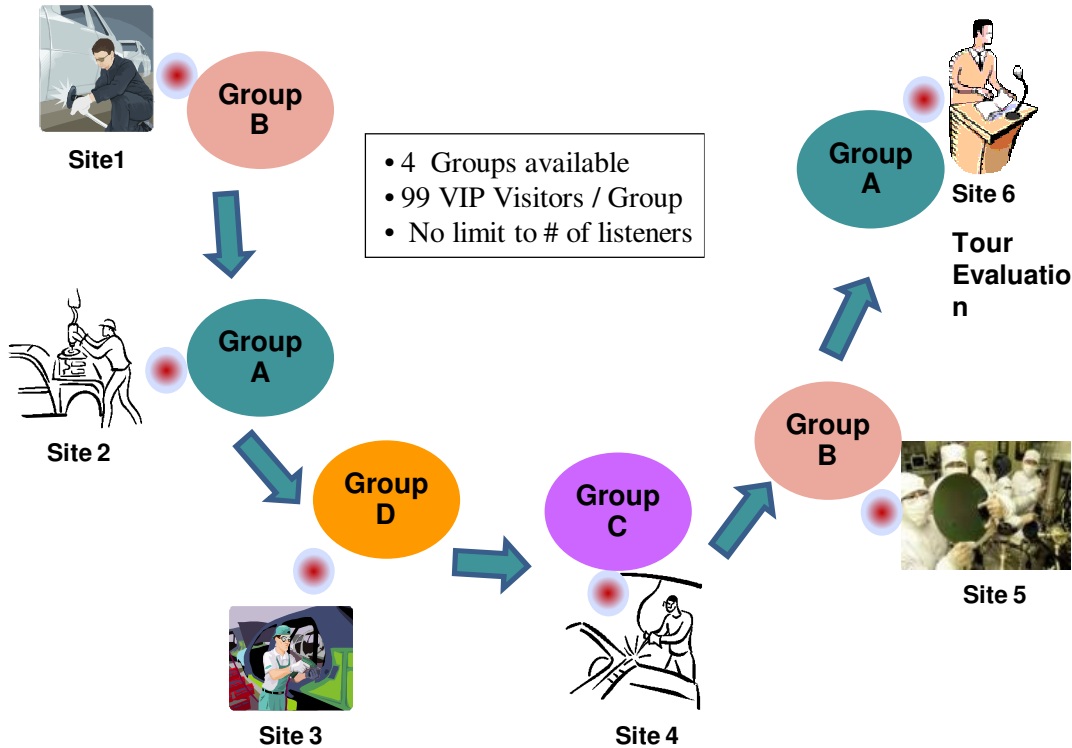
# Target Applications and Use Cases

- Broadcasting with interactive communications
- Wireless (Mobile) VoIP
- Group games
- Personal media
- Wireless audio
- M2M (Sensor network)
- Others

Broadcasting with  
interactive communications:  
Tour guide, Education, Sports

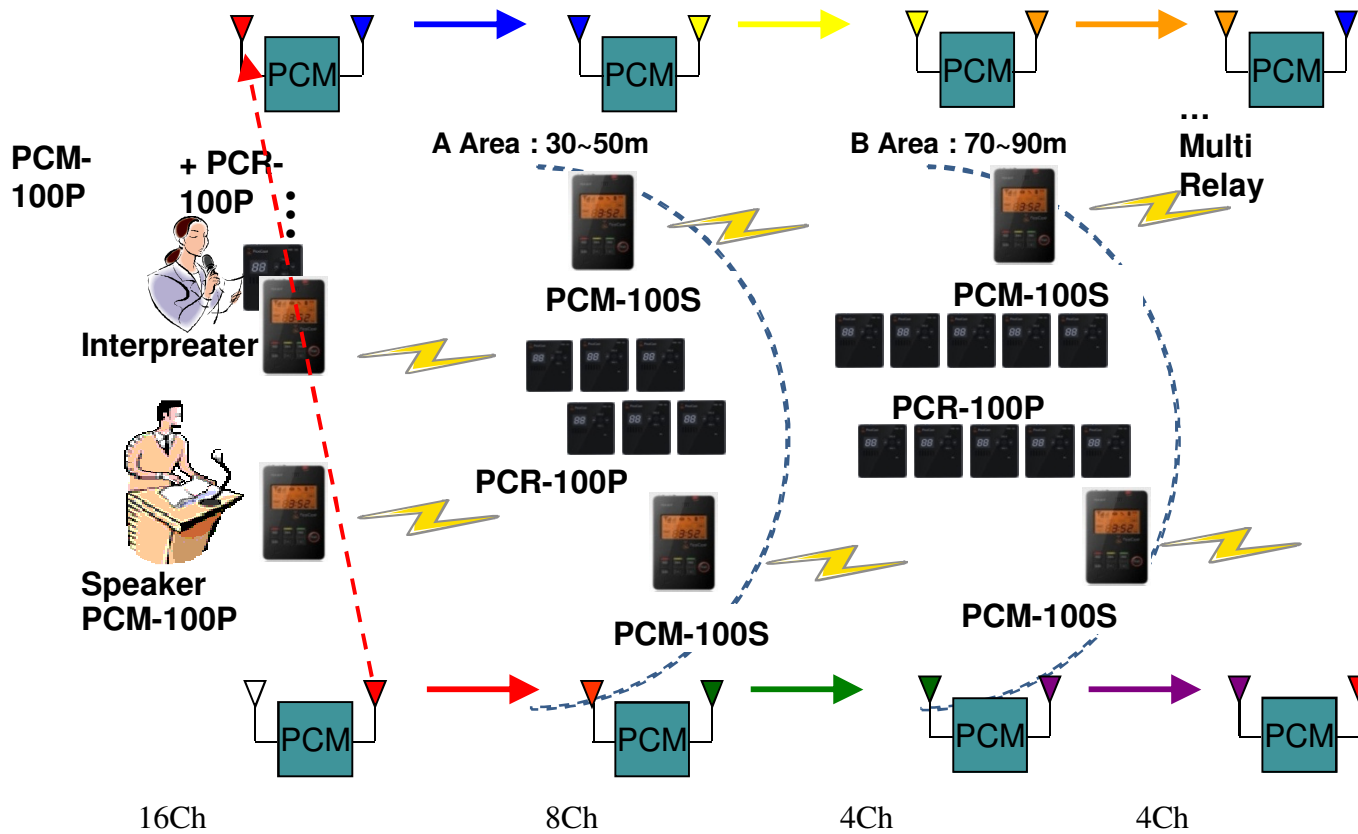


Channel capacity  
Concurrent transmission  
Unlimited receivers  
Repeater - Cell extender



# Multi Lingual Interpretation System with cell extension

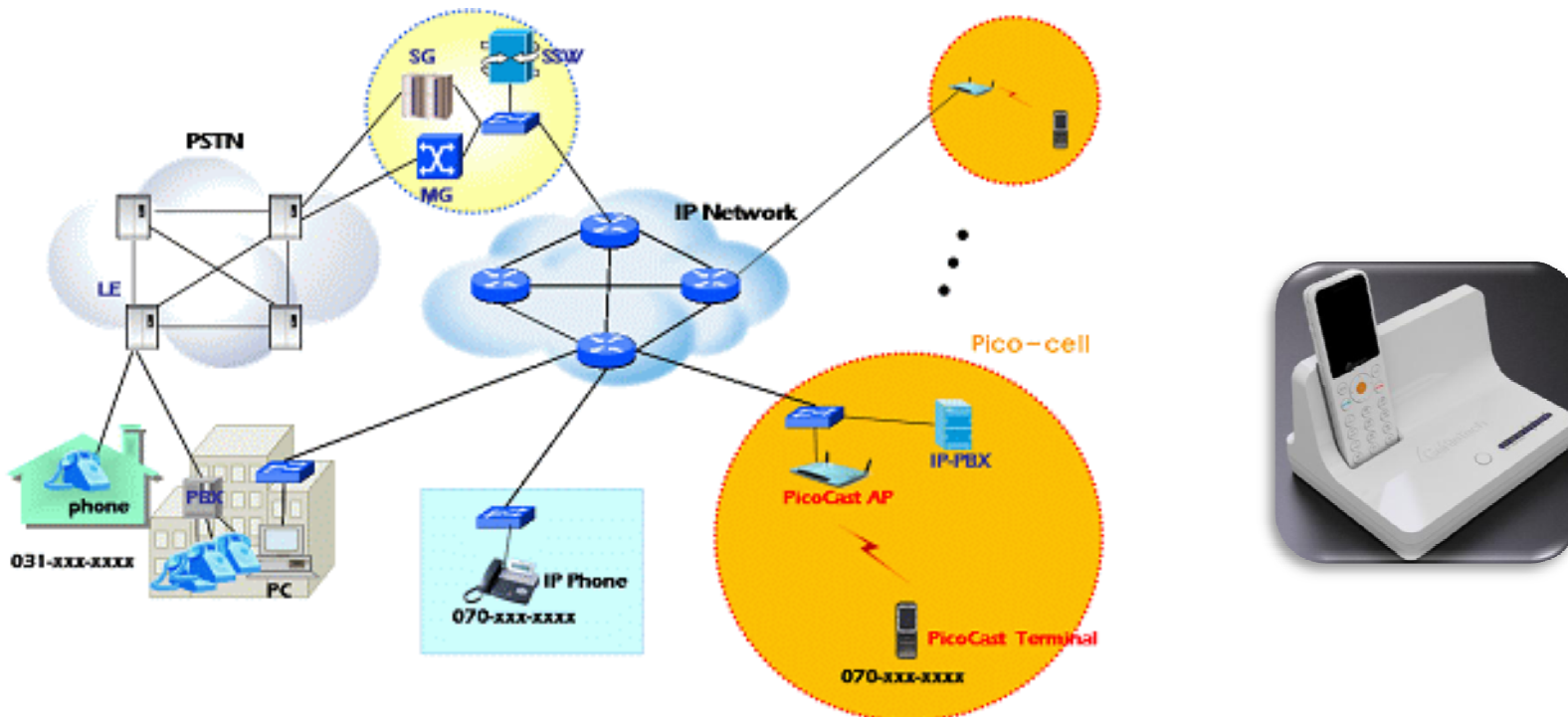
## Cell extender: Synchronous system with robust sync



Wireless (Mobile) VoIP:  
Mobile VoIP, Wireless PBX



- Channel capacity
- Concurrent active channels
- Soft handover
- Privacy
- Repeater - Cell extender



Group games



Latency: < 16ms  
Wired Voice quality  
Channel capacity  
Concurrent active channels



Sure, it is.  
Let's enjoy  
Group Game...



Thanks, Grandpa.  
**"Smarterphone"**  
is also a  
Chatting Game  
Machine

Personal media: CD quality music, video, remote controller



Latency: < 16ms  
Data rate: < 4M bps  
Convergence: audio, video, control  
Concurrent active channels



- Graphic Controller
- Group Game Machine
- Mobile IPTV
- Internet DMB
- Personal Broadcaster
- PSC Terminal



Wireless audio: Cordless microphones, headset, wireless speakers, distributed speakers



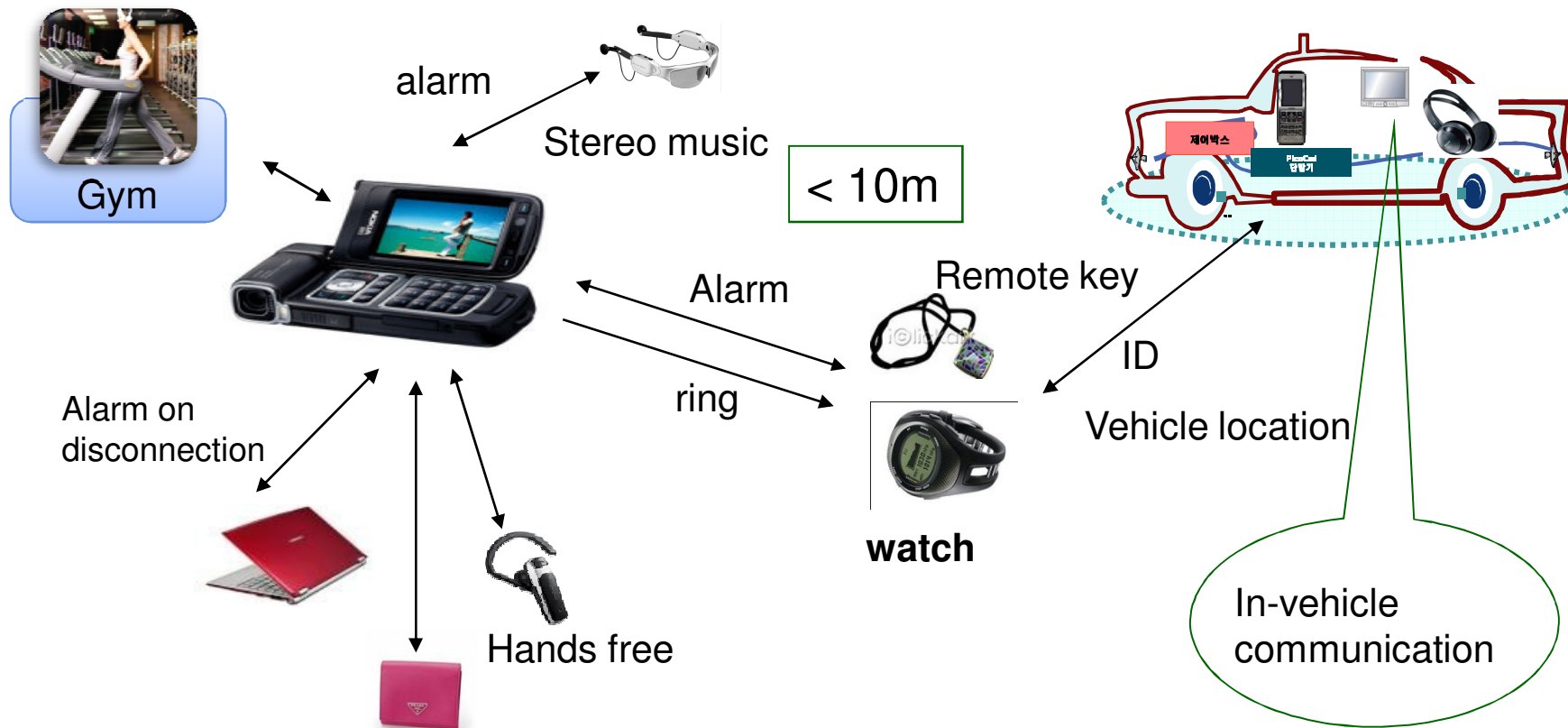
Latency: < 16ms  
Data rate: < 2M bps  
Channel capacity  
Concurrent active channels



Personal Sensor network:  
Health, Safety , lost & found



Power consumption  
Number of devices  
Convergence: audio, video, sensor



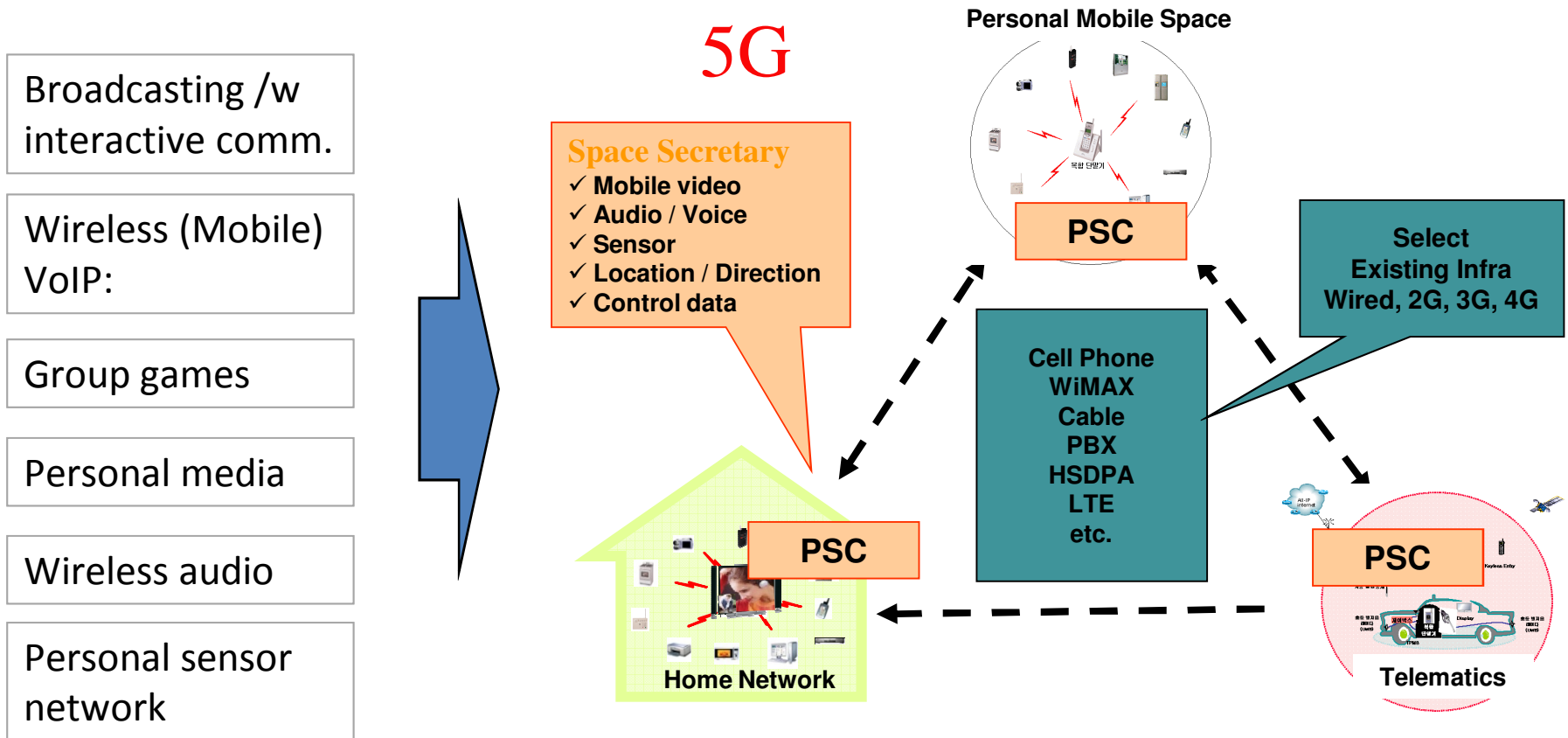
Others: Amusement parks



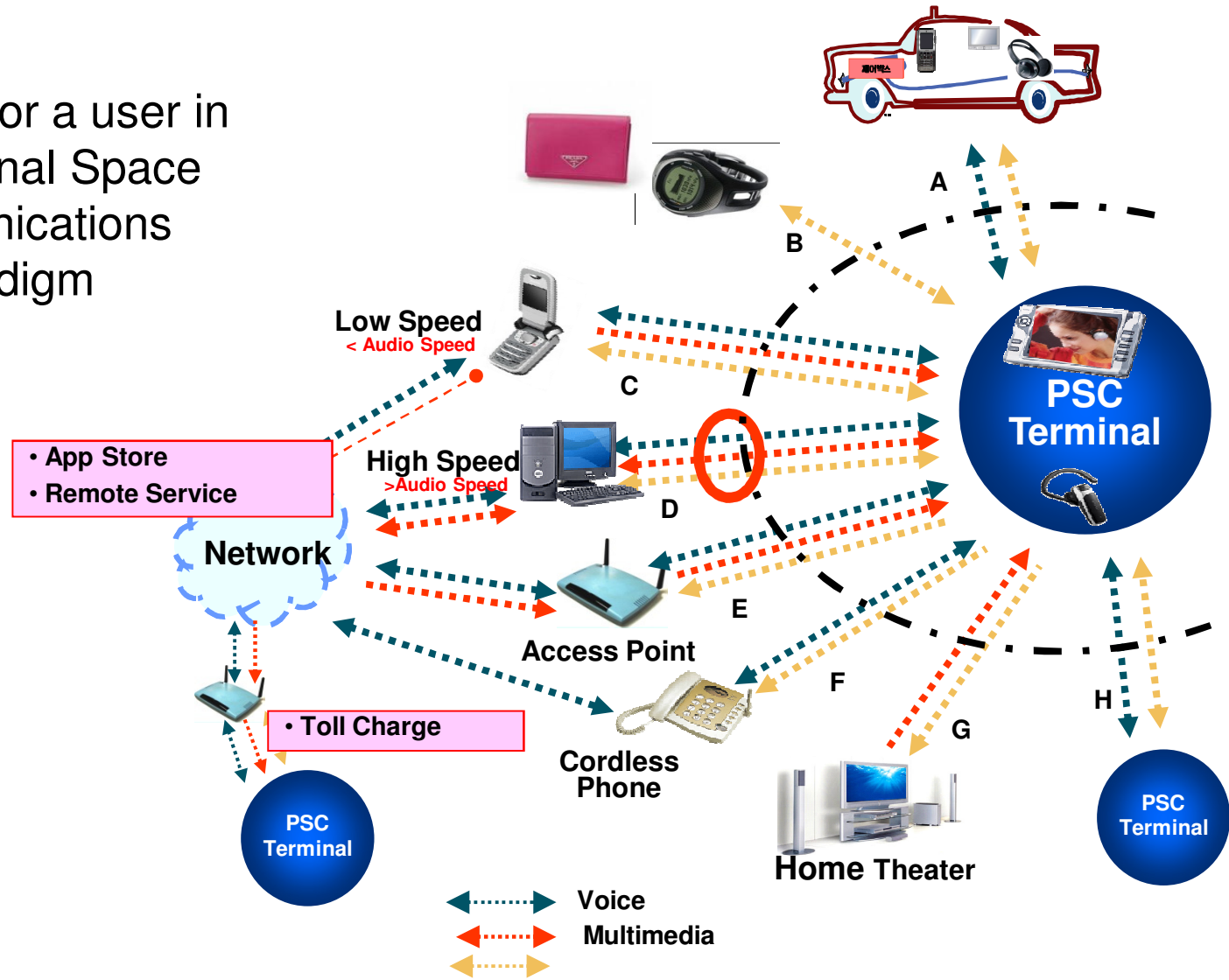
Channel capacity  
Concurrent transmission  
Unlimited receivers  
Repeater - Cell extender



We envision that, in the future, the user will be the center of the services and the Personal Space Communications will be the common interface to the environments the user moves into



# Interfaces for a user in the Personal Space Communications paradigm



## Summary of Requirements

- Broadcasting with interactive communication and cell extension ⇒ Synchronous system
- Soft Handover
- CD quality audio, Wire line quality voice, SVGA video ⇒ Data rate up to 4M bps, FER <math>< 10^{-6}</math> with effective diversity measures
- Channel capacity ⇒ Concurrent transmission > 16 within the cell boundary, Unlimited receivers
- Latency < 16 ms
- Power consumption ⇒ similar to Bluetooth
- Personal Portable/Cordless ⇒ price similar to Bluetooth, reasonable complexity
- Others

## Comparison with Other Technologies

Types		WiFi	DECT	ZigBee (RF4CE)	Bluetooth (Wibree)	WBAN	?	PSC
Major Area		Wireless Internet	Codeless Phone	Sensor	1M (3M)	Body Application	?	Personal Interface
C o m m o n	Range	~ 100m	~ 200m	~ 100m	~ 100m	10m	?	~ 30m
	Latency	~ 100msec	~ 20m	~ 200m	~ 100m			St < 16msec Mono < 6msec
	Speed (bps)	54M	96K	250K	1M (3M)	?	?	4M (16M)
	Security						?	PHY support 64bits + 16bits
	Sync Preamble	64bits	?	64bits	64bits	?	?	128bits, 127 Kinds
D i s t i n c t	# of concurrent Tx	-	-	-	-	-	-	16
	# of receiver	-	-	-	-	-	-	No limit
	Sync Relay	X	X	X	X	X	?	O
	Quality	-	-	-	-	-	?	Wired Quality
V o i p	Arial Channel Capacity	-	-	-	-	-	?	128ch
	Soft Hand-over	X	X	X	X	X	?	O
	Internet Radio convergence	X	X	X	X	X	?	O

## Summary

- Target application categories for the personal space communications have been explored with use cases
- Identified technical requirements for each of the use cases.
- An implementation has been presented, and feasibility has been demonstrated through a series of service demos based on commercial products.
- Next steps
  - Identify alternative solutions
  - Contribution with more use cases and associated technical requirements from the members are expected