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

**Submission Title:** [Applications and use cases for peer aware communications]
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**Re:** [Respond to the CFP of PAC]

**Abstract:** [Applications and use cases proposal for PAC are presented. Required features for PAC are described]

**Purpose:** [This document is to respond to call for presentation on PAC]

# Applications and Use Cases for Peer Aware Communications

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# Outlines

- Purpose of this document
- Example of infrastructures --- Mobile phone
  - Convenient but not dependable enough
- Need for PAC
- Examples of usage model of PAC
- Conclusion remarks

# Purpose of This Document

- In Okinawa interim meeting (September 2011), a proposal was disclosed to start a study group of peer aware communication (PAC).
- A call for presentation was announced on September 27 to solicit presentations on use cases and applications, visions of markets, and business models for PAC.
- The purposes of this document is to show the necessity of PAC with some examples on applications and usage models.

# Important Infrastructures

- Internet on fiber
- Broadcasting network (cable and wave)
- GPS based services
- Mobile phone
- WLAN

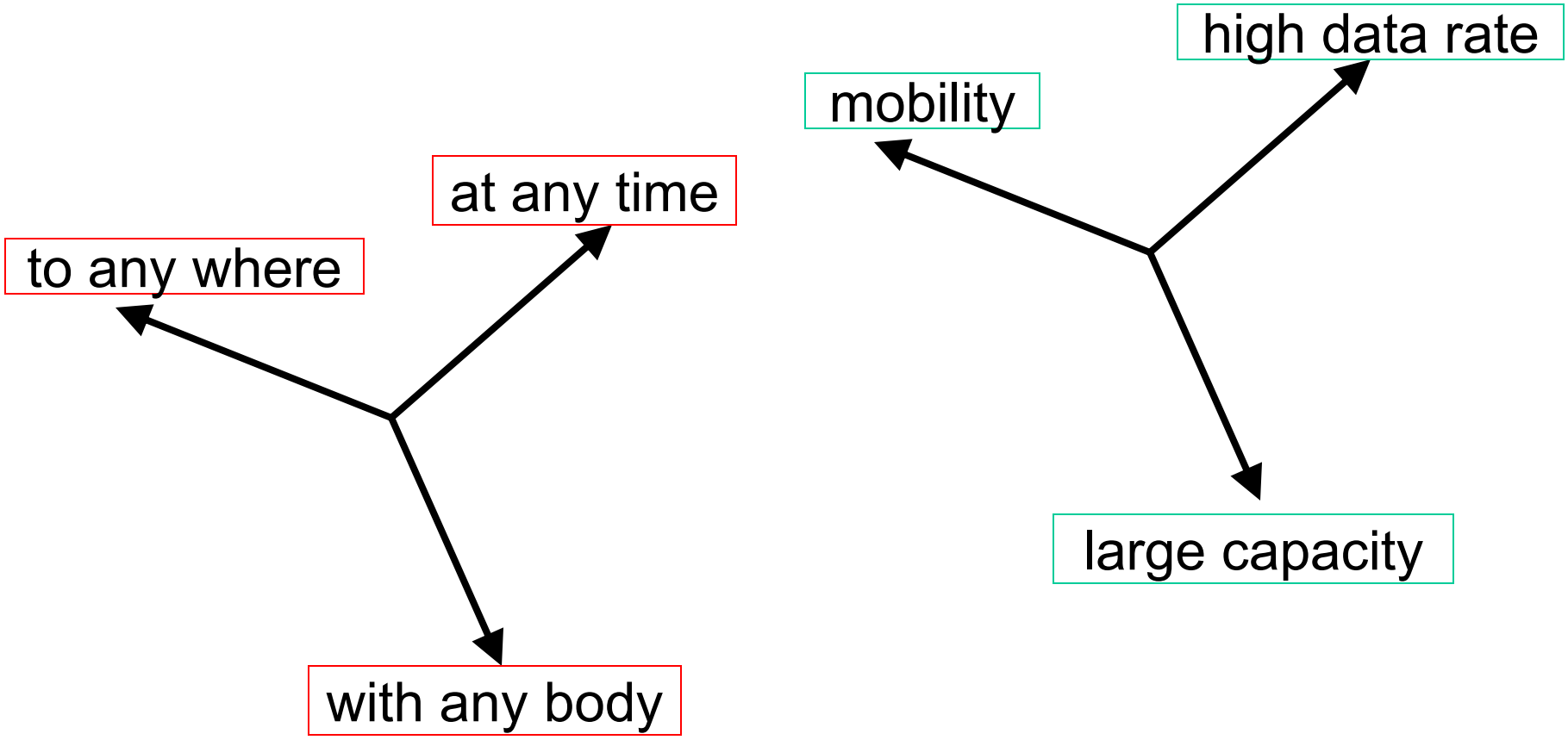
Communication plays important role in daily life.
Is it good enough?

# Evolution of Mobile Phone

- 2G: GSM PDC, PHS
- 3G: W-CDMA, CDMA-2000
- Beyond 3G: LTE,


It's one of the most convenient, useful tool …

# Ultimate of A Mobile Phone




Does dream come true ?

# A Mobile Phone Doesn't work

- In major disasters like earth quake, tsunami …
  The base station may be destroyed for several ten days, even months.
- In occasional occurrence like hurricane, typhoon, floods …
  The base station may be destroyed for days, weeks.
- In accident occurrence like power outage, server breakdown
  The base station may be out of order for several hours

The most convenient tool at hand but it can't work !!

# The Base Station alive but …

- In catastrophic event like train accidents or other big events

  The base station is alive but a mobile phone can not be connected because of overload traffic.

- For geographic reasons when traveling in a train or in a car

  A mobile phone enters uncovered area like tunnel, underground …

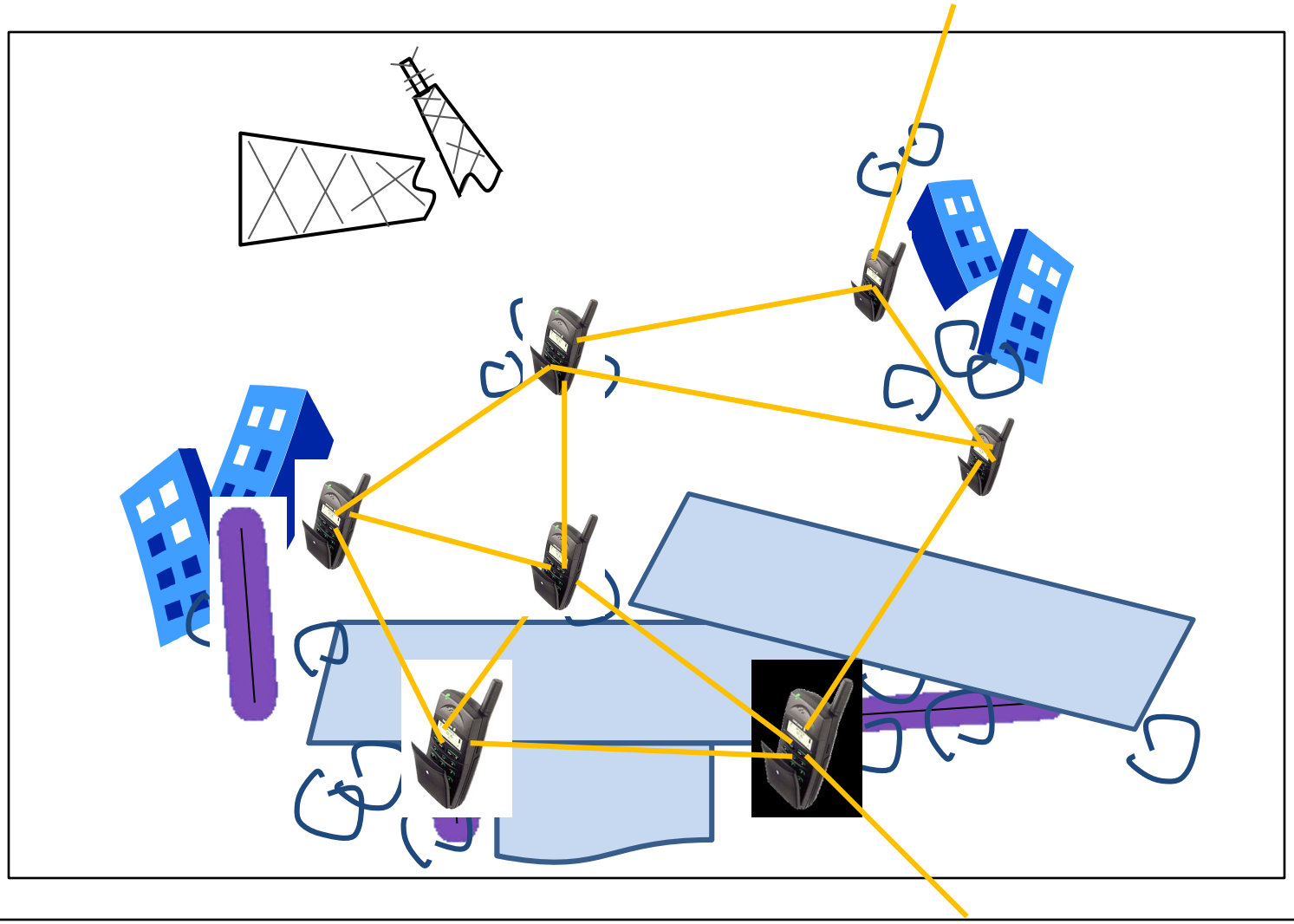
A mobile phone doesn't work at any where, at any time ?

# Needs For Peer Aware Communications

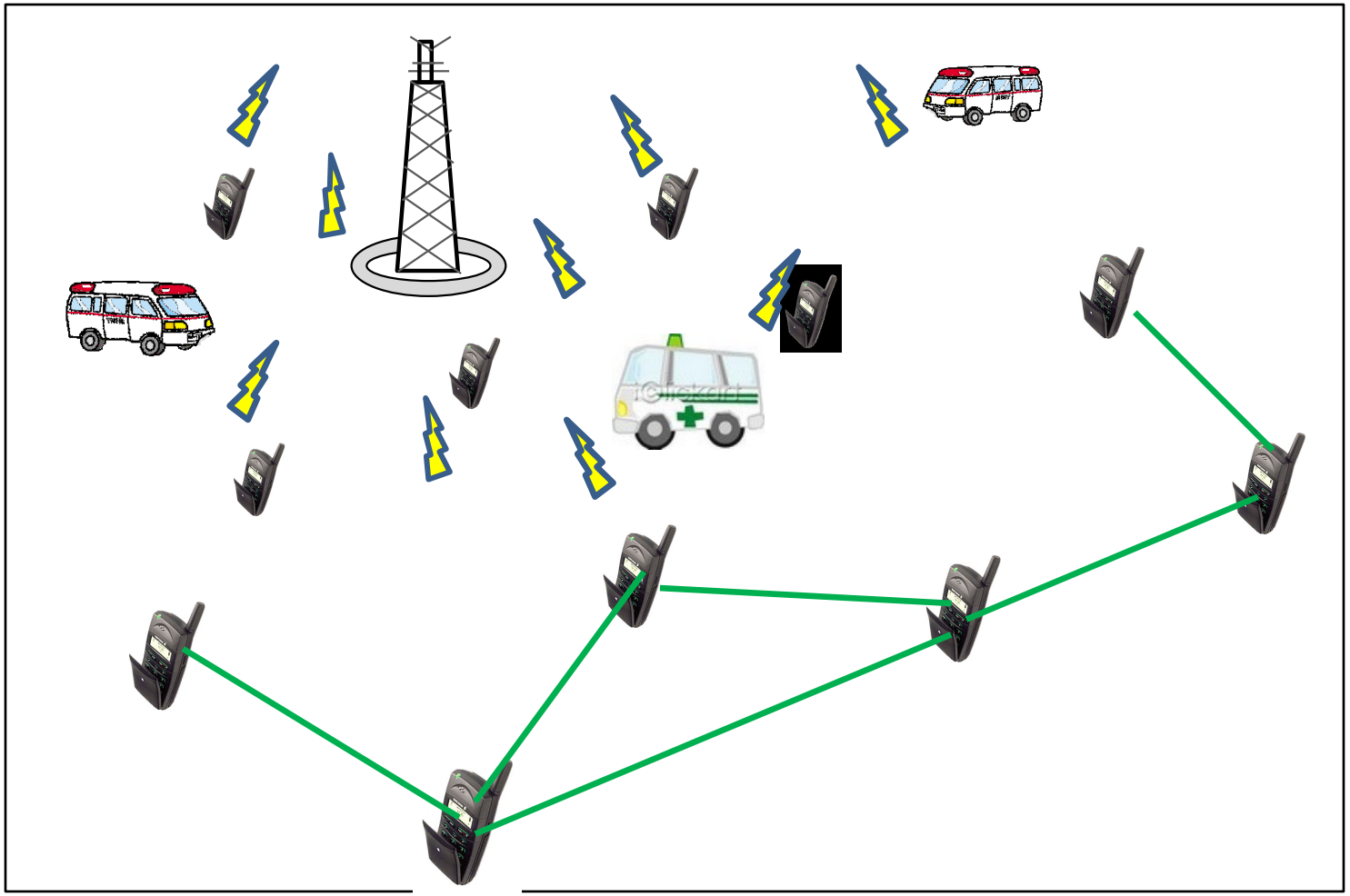
- Need an additional mechanism to guarantee being connected at any where and at any time when a cluster of peers exist.
- The connection must be organized without a particular centralized base station.
- The PAC-NET must operate independently but should also be connected to infrastructure.

Different features required in comparison with existing infrastructures

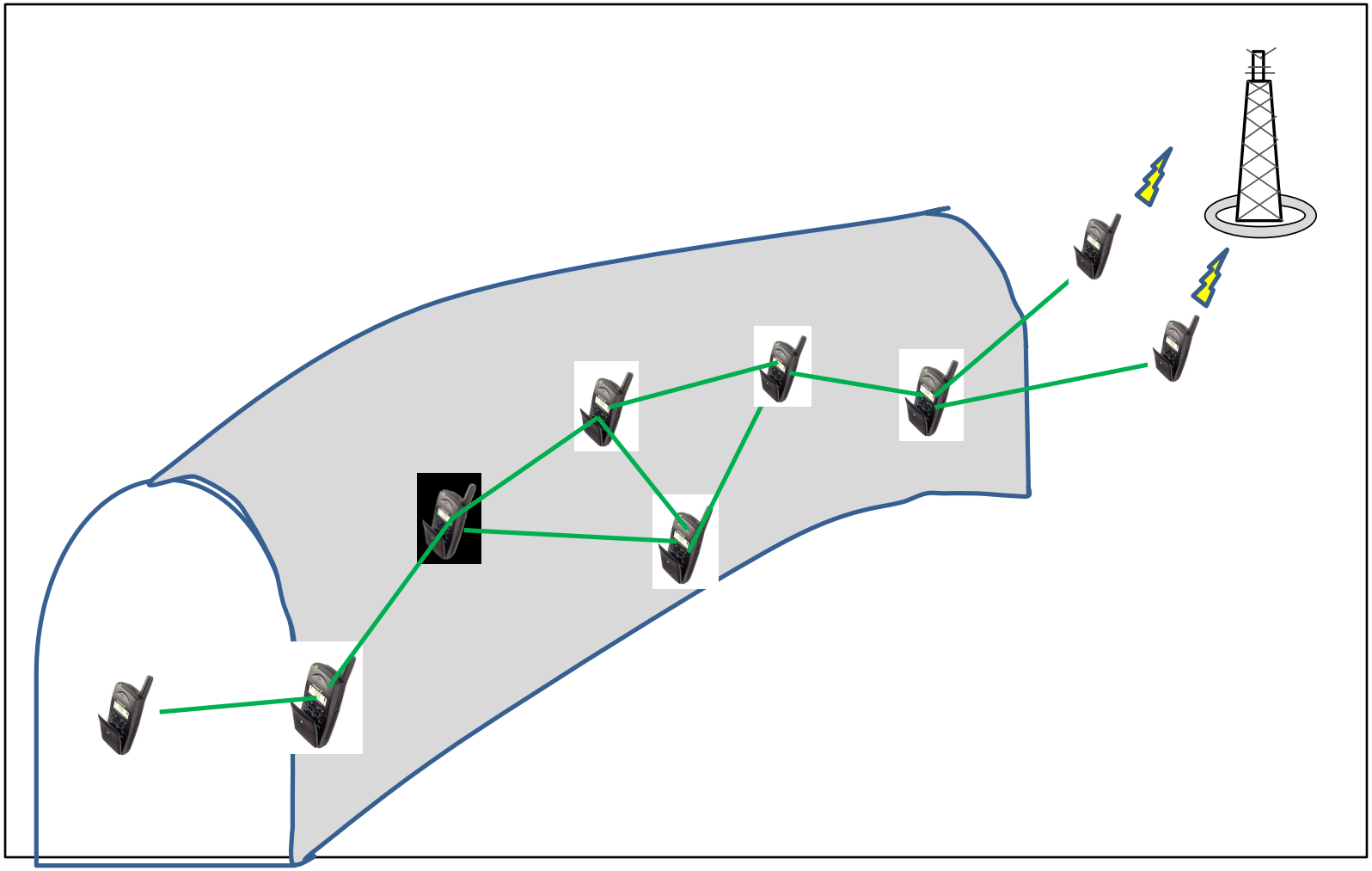
# Usage Model --- SOS in Disasters



# Usage Model --- Avoidance of Congestion



# Usage Model --- Extension to Infrastructure



# Can IEEE 802 help ?

- Bluetooth (IEEE 802.15.1)
- ZigBee (IEEE 802.15.4)
- WiFi (IEEE 802.11…)

Not really.
Should be distributed, self organized …

# Needed Features

- Distributed and self organized
- A high degree of autonomous and ad hoc
- Multiple relay and cooperative communication
- Heterogeneous networking
- Congestion avoidance
- Special mode for disaster and emergency
  - Extremely low power consumption for long time operation
  - To send SOS and report location in case of disasters
  - Low emission power for long distance

# Conclusion Remarks

- Examples of application and usage models for PAC are presented.
- With mobile phone as an example, it is shown that demand for a PAC network exists.
- PAC is expected to play a complementary role or as an extension of infrastructure.
- The distinguished features that a PAC need to have are described.
- Important role to enable wireless connection of anywhere and at any time.