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# Introduction to Wireless Networks

無線網路導論

**Syllabus**

**Prof. Yuh-Shyan Chen**

**Department of CSIE**

**National Taipei University**



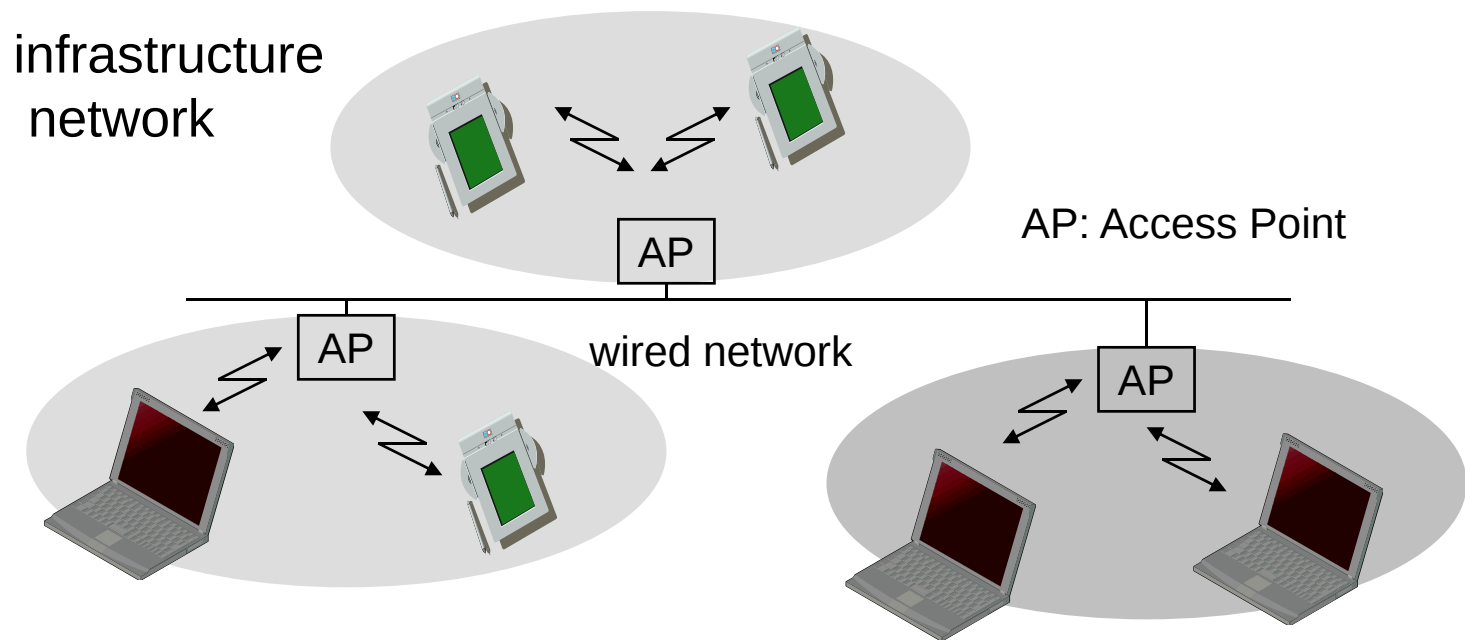
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# Outline:

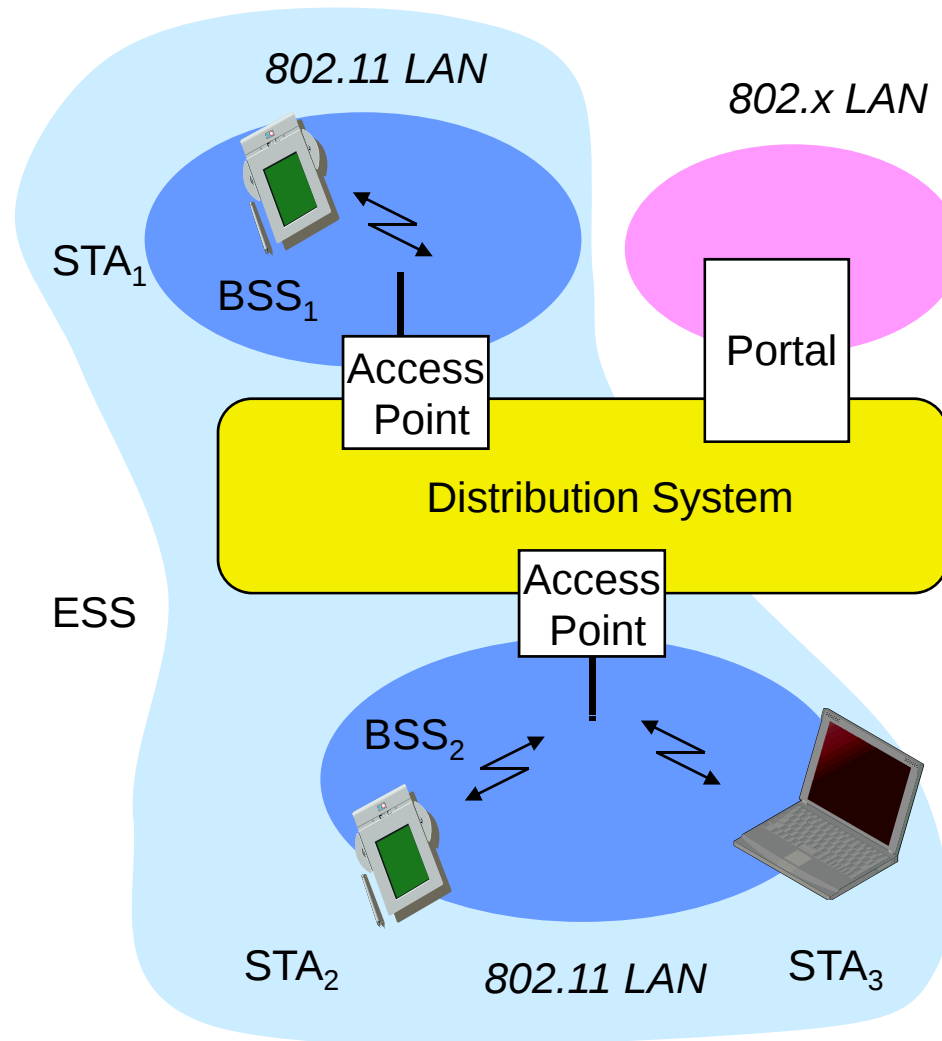
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- Chapter 1: **Introduction to Wireless Local Area Networks**
- Chapter 2: **Introduction to IEEE 802.11**
- Chapter 3: **Introduction to Bluetooth**
- Chapter 4: **Introduction to GSM**
- Chapter 5: **Introduction to 2.5G (GPRS)**
- Chapter 6: **Introduction to 3G (WCDMA)**
- Chapter 7: **Introduction to ALL-IP Networks**
- Chapter 8: **Introduction to IEEE 802.16 (WiMax) Networks**
- Chapter 9: **Introduction to 3GPP LTE (4G) Networks**
- Chapter 10: **Introduction to Mobility Issues**
- Chapter 11: **Introduction to Mobile Ad Hoc Networks**
- Chapter 12: **Introduction to Wireless Sensor Networks**
- Chapter 13: **Introduction to Vehicular Networks**
- Chapter 14: **Introduction to Underwater Networks**

# Chapter 1: Introduction to Wireless Local Area Networks



## Chapter 2: Introduction to IEEE 802.11



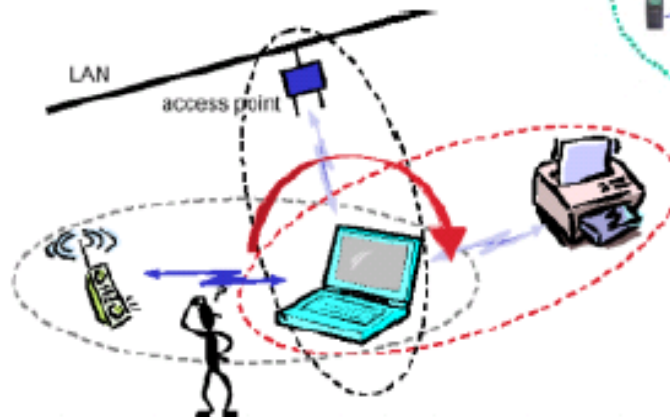
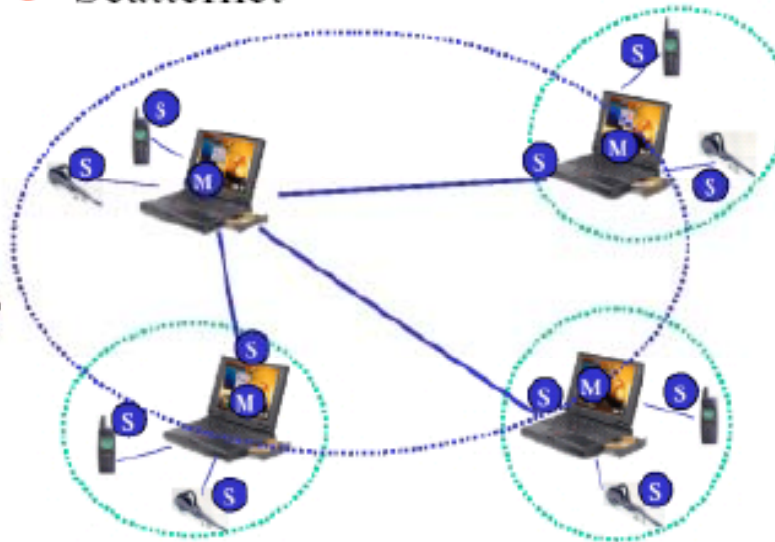
# Chapter 3: Introduction to Bluetooth

## Bluetooth Network

- Piconet



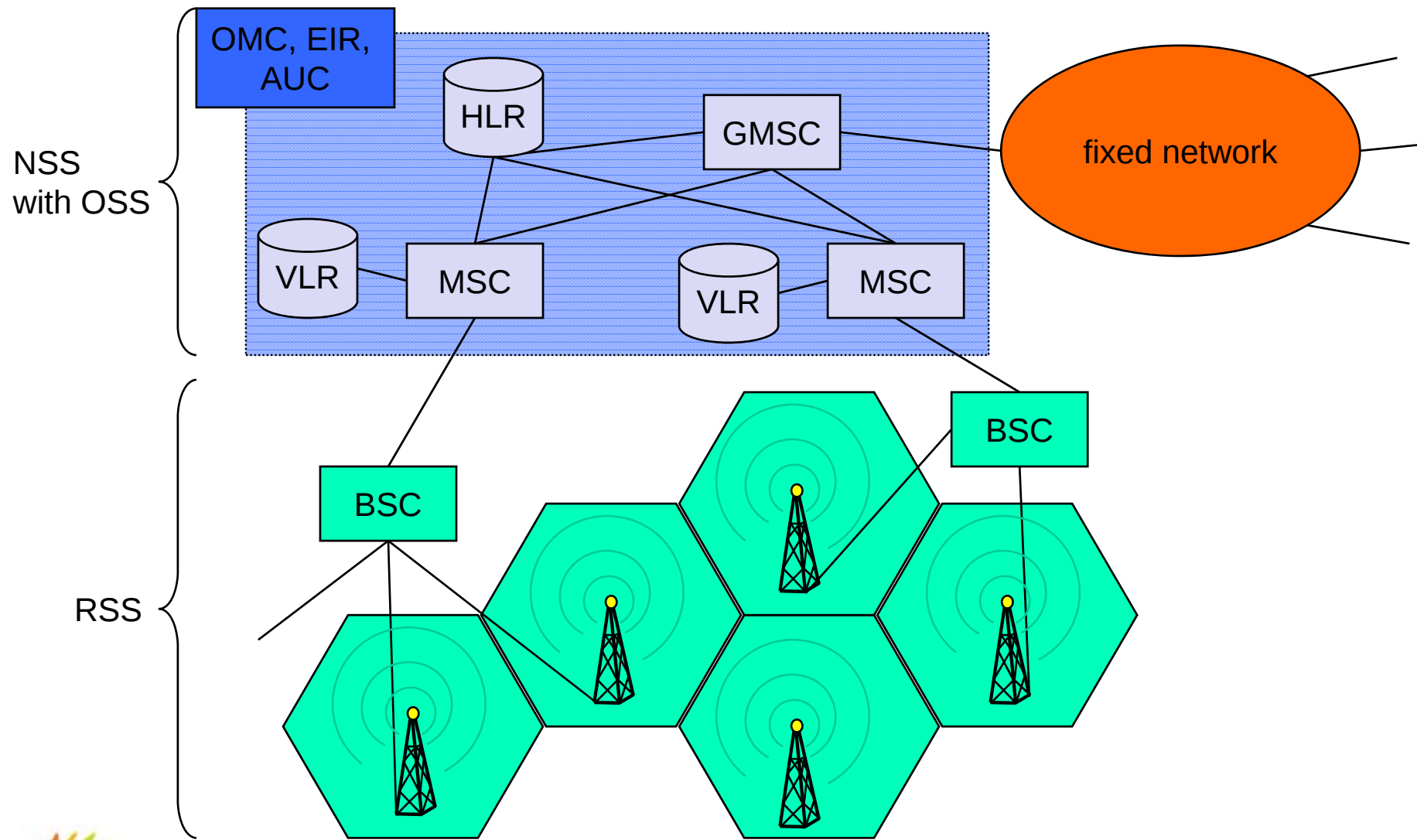
- Scatternet



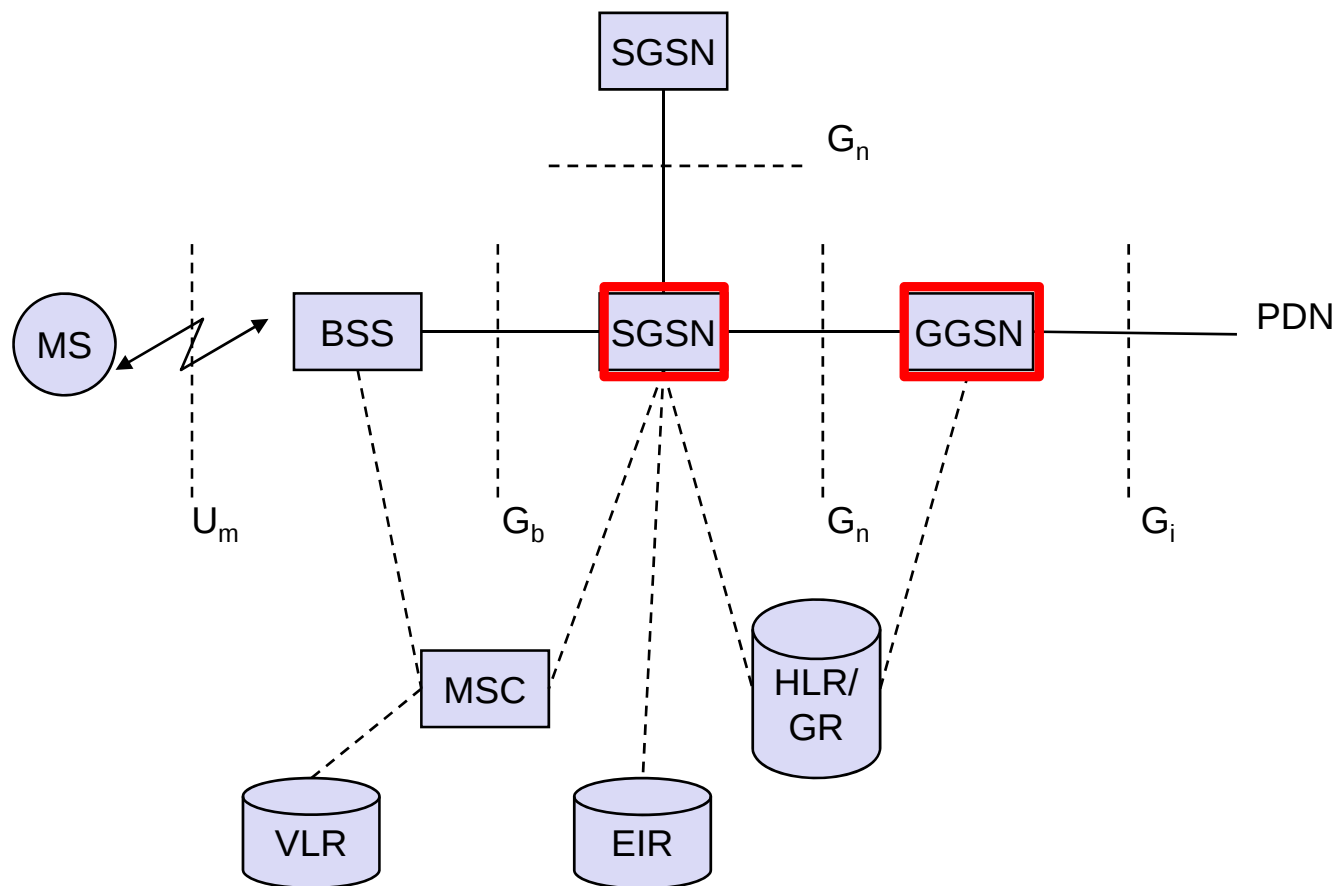
How to jump efficiently between piconets?

Delay sensitive applications?

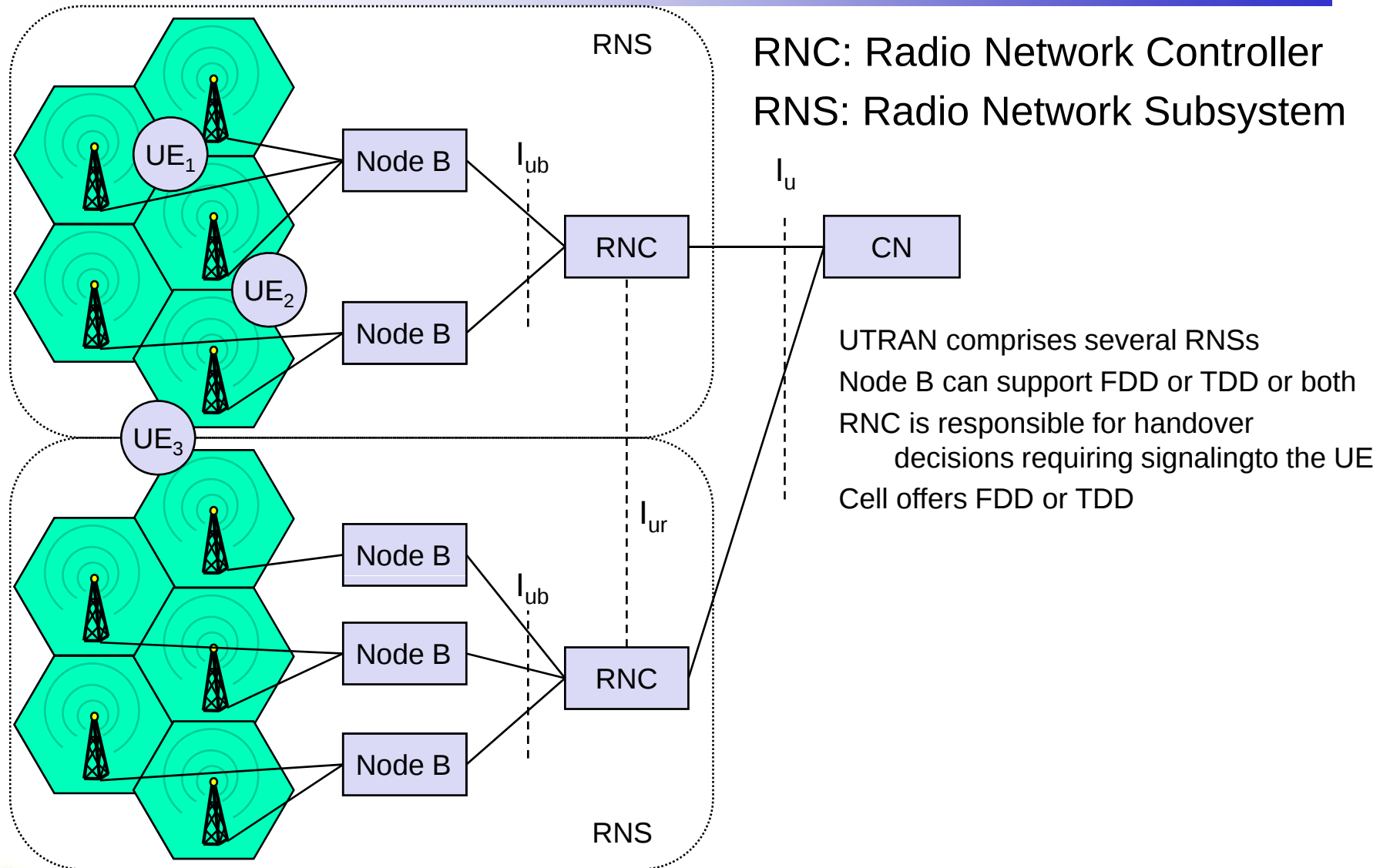
# Chapter 4: Introduction to GSM



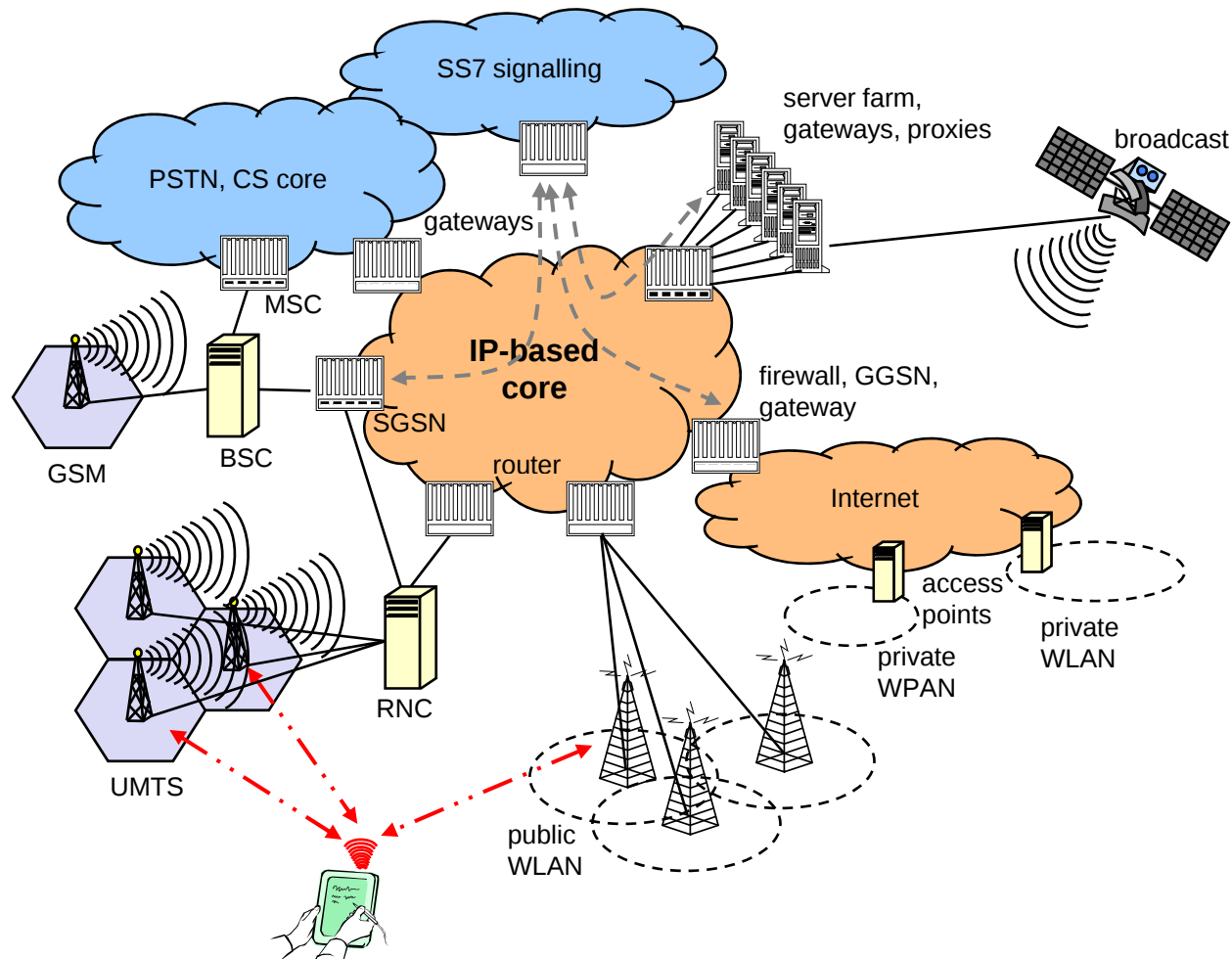
## Chapter 5: Introduction to 2.5G (GPRS)



# Chapter 6: Introduction to 3G (WCDMA)



# Chapter 7: Introduction to ALL-IP Networks



## Chapter 8: Introduction to WiMax (IEEE 802.16)

The screenshot shows a Microsoft Internet Explorer browser window. The title bar reads "IEEE 802.16, WiMAX WMAN Resource Center - Microsoft Internet Explorer". The address bar shows the URL "http://www.palowireless.com/i802\_16/". The search bar contains "IEEE 802.16". The main content area features the "palowireless" logo and the heading "IEEE 802.16 WMAN Resource Center". Below this, the page is titled "IEEE 802.16, WiMAX WMAN Resource Center Contents". The central content area lists several bullet points: "Welcome to our new section on IEEE 802.16 - the IEEE Standard for Wireless Metropolitan Area Networks (MANs), also known as WiMAX and WirelessMAN.", "IEEE 802.16 is working group number 16 of IEEE 802, specialising in point-to-multipoint broadband wireless access.", "WiMAX is an acronym that stands for Worldwide Interoperability for Microwave Access.", "Enjoy our resources, information, news, articles and tools.", and "Click here to suggest a site for our listings." On the left side, there is a sidebar with a "What's new?" button and a list of links: Home, Search, Market, Research, Add a Link, Advertising, Consulting, and Investors. Below this is a section for "IEEE 802.16, WiMAX" with links to Books, Consultants, Events, Forums, Jobs, and News. On the right side, there is a "Coming Soon:" section with two announcements: "Europe WiMAX 2007 27 Nov 2007 Munich, Germany" and "Asia-Pacific WiMAX Forum 16 Oct 2007 Taipei, Taiwan". The bottom of the browser window shows the Windows taskbar with the Start button, several open applications, and the system clock displaying "20:26 Monday".

IEEE 802.16, WiMAX WMAN Resource Center - Microsoft Internet Explorer

檔案(E) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

網址(D) http://www.palowireless.com/i802\_16/ 移至 連結

Google IEEE 802.16 Go 12 blocked Check AutoLink Settings

What's new?

palowireless

IEEE 802.16 WMAN Resource Center

IEEE 802.16, WiMAX WMAN Resource Center Contents

- Welcome to our new section on IEEE 802.16 - the IEEE Standard for Wireless Metropolitan Area Networks (MANs), also known as WiMAX and WirelessMAN.
- IEEE 802.16 is working group number 16 of IEEE 802, specialising in point-to-multipoint broadband wireless access.
- **WiMAX** is an acronym that stands for **W**orldwide **I**nteroperability for **M**icrowave **A**ccess.
- Enjoy our resources, information, news, articles and tools.
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IEEE 802.16,  
WiMAX  
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Jobs  
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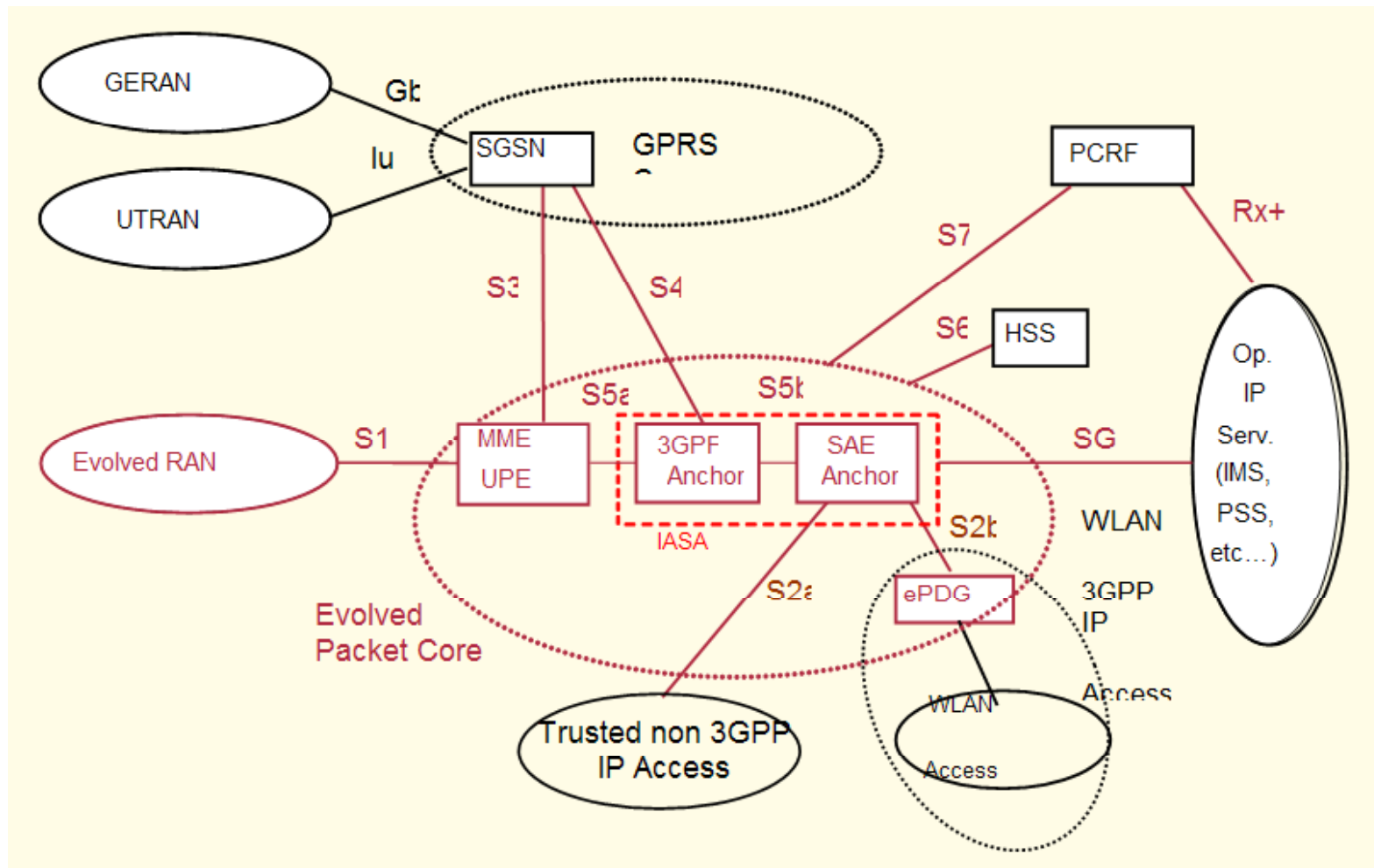
Coming Soon:

Europe  
**WiMAX 2007**  
27 Nov 2007  
Munich,  
Germany

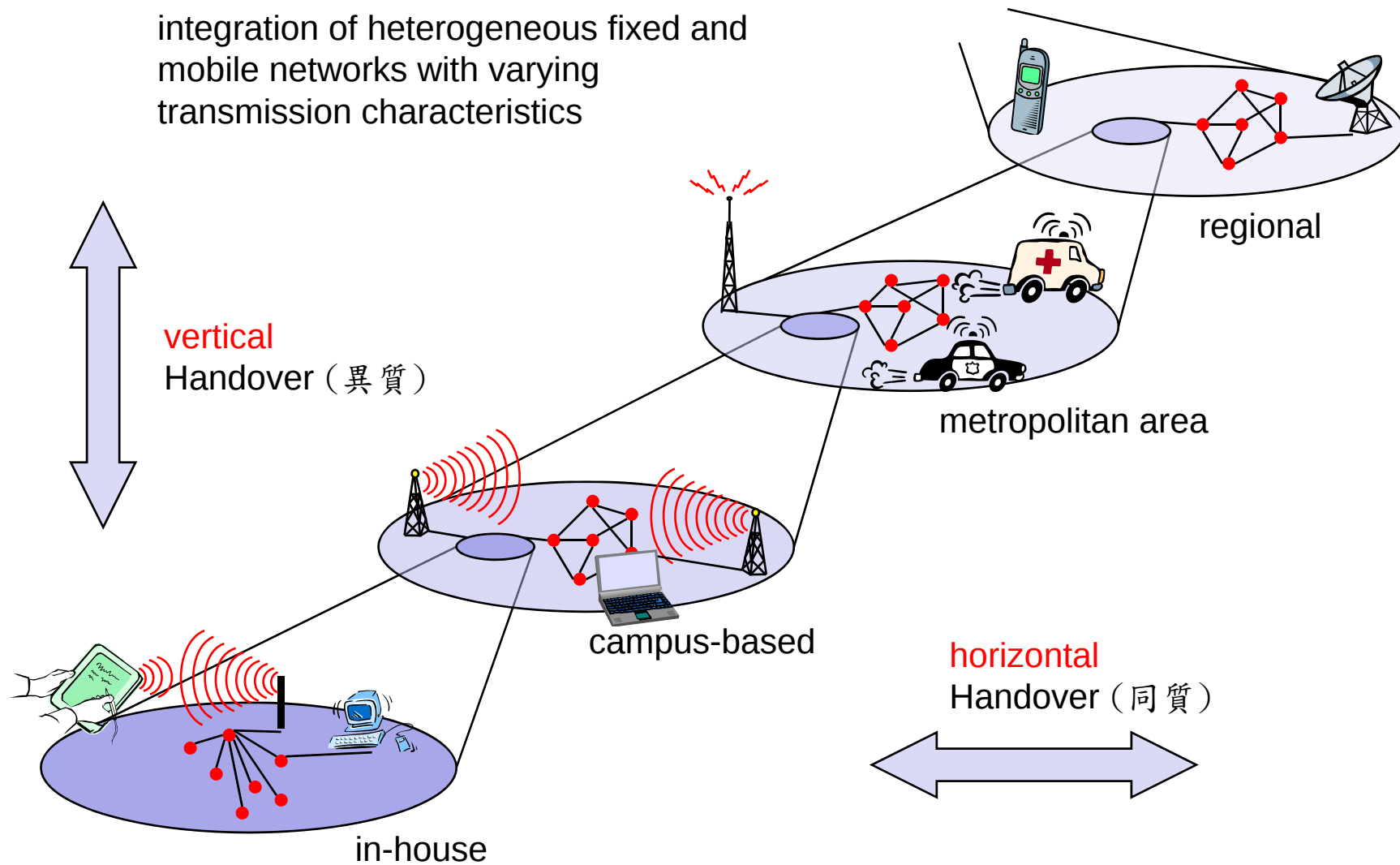
Asia-Pacific  
**WiMAX Forum**  
16 Oct 2007  
Taipei, Taiwan

完成 開始 IEEE 802.16... My eBooks wn\_ch0\_1 網址 20:26 Monday

## Chapter 9: Introduction to 3GPP LTE (4G)



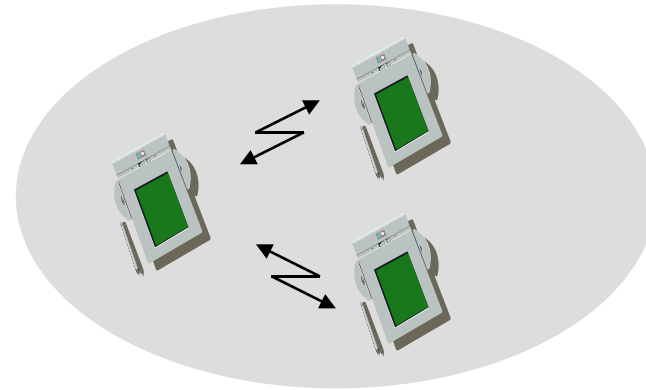
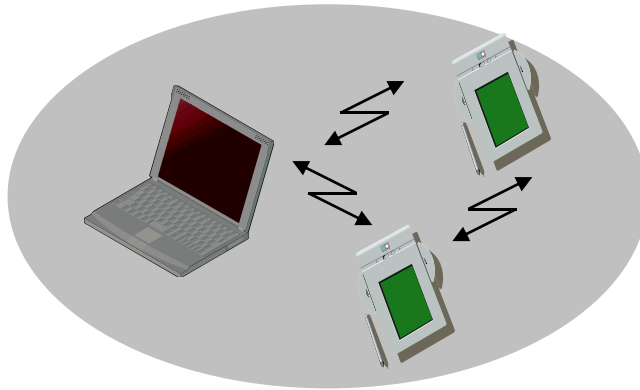
# Chapter 10: Introduction to Mobility Issues (Handover)



# Chapter 11: Introduction to Mobile Ad Hoc Networks

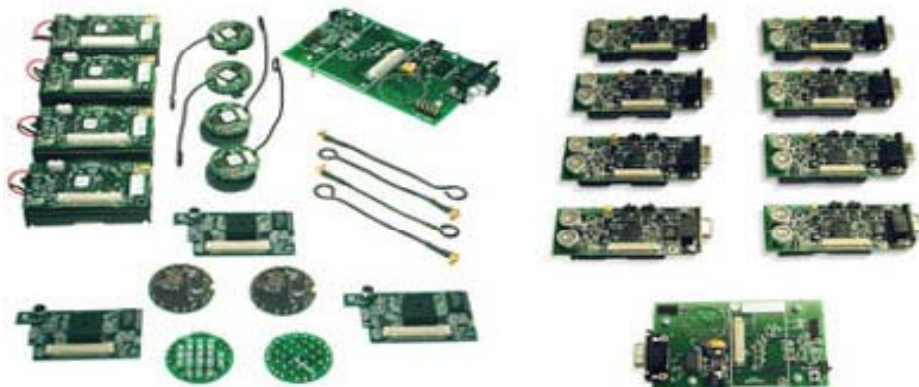
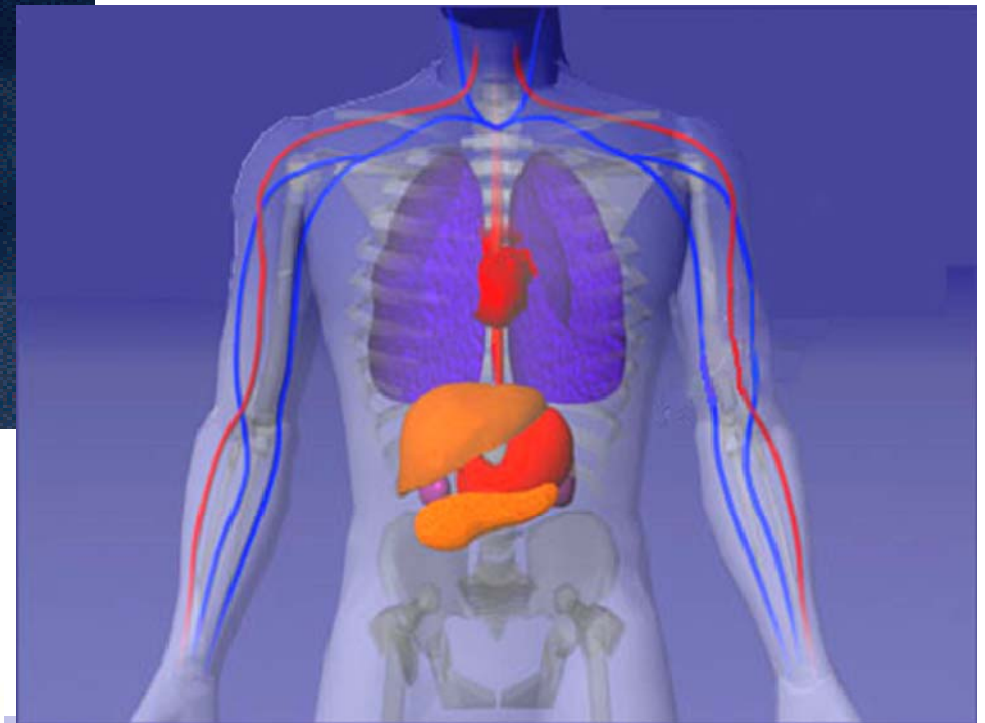
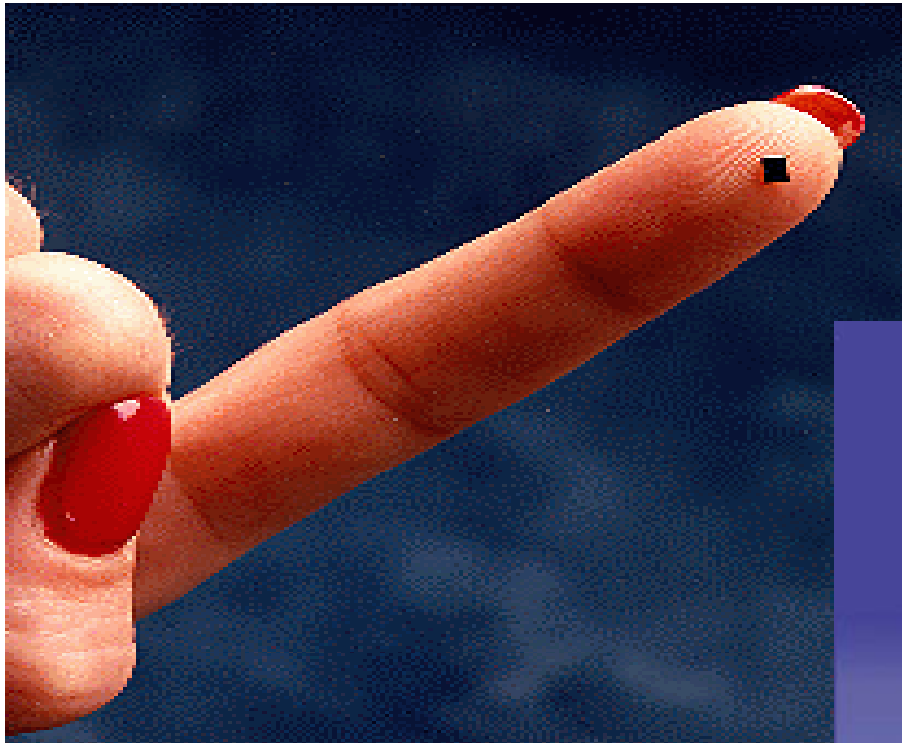
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ad-hoc network



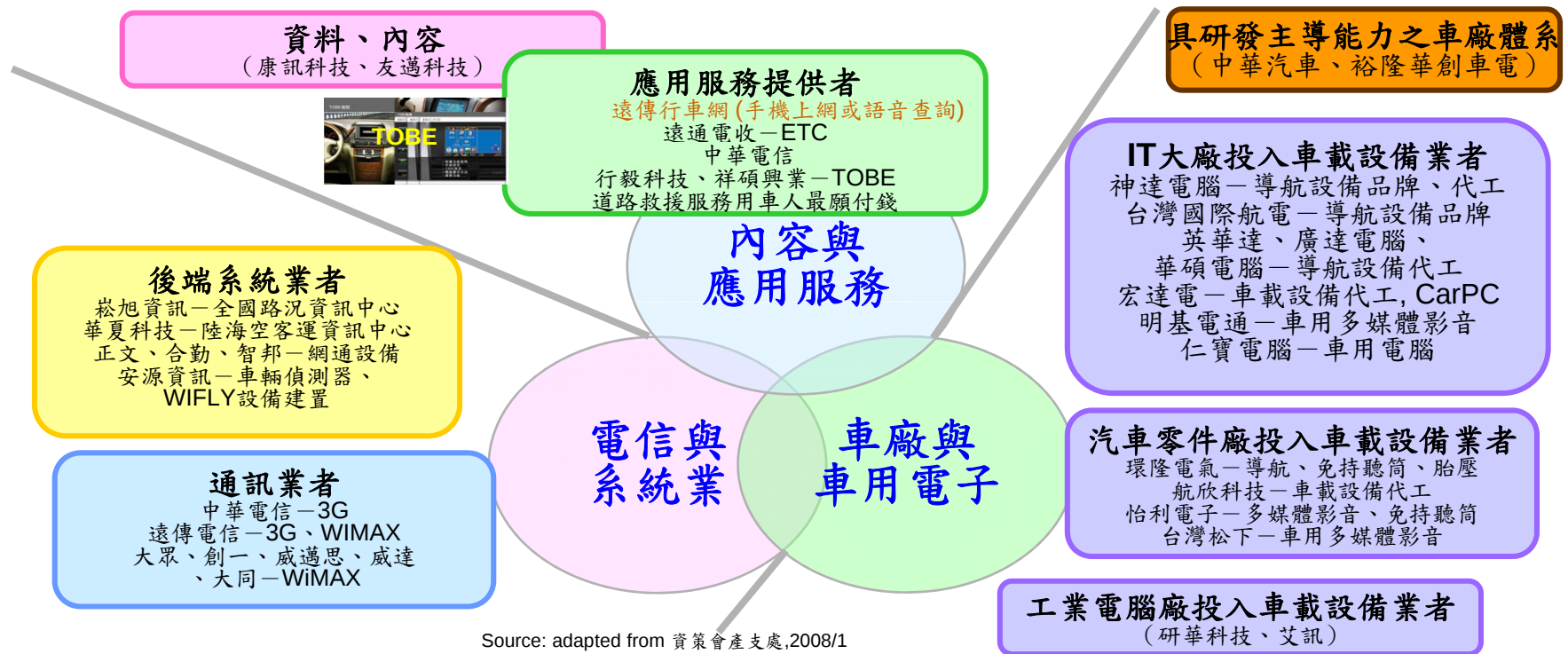
# Chapter 12: Introduction to Wireless Sensor Networks

## Example of Wireless Bio-Sensor

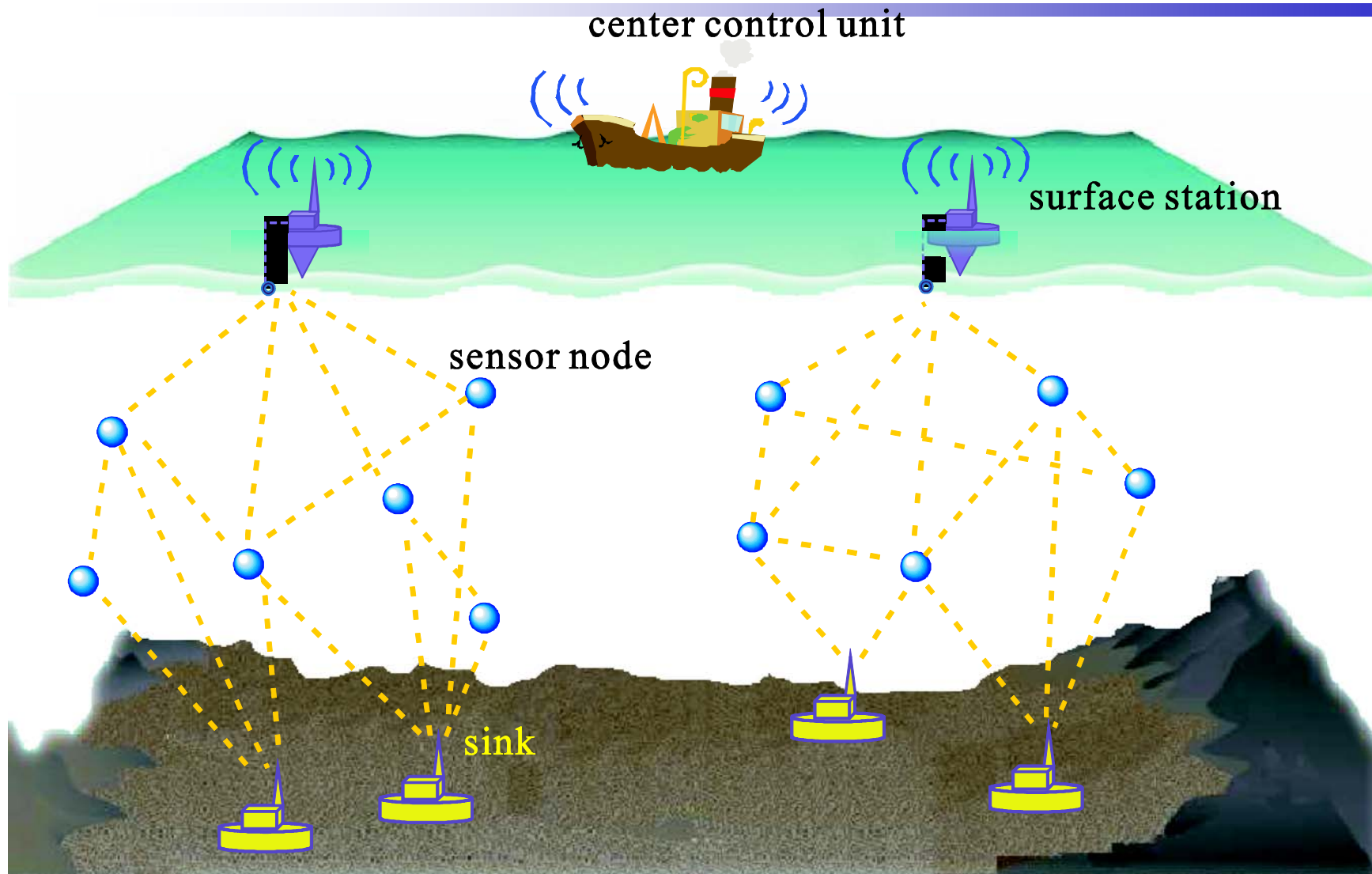


# Chapter 13: Introduction to Vehicular Networks

## 車載機資通訊產業現況



# Chapter 14: Introduction to Underwater Networks



# 學期成績計算方法

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1. Homework<sub>S</sub> (10%)

2. Term Project (3 人一組) (20%)

Smart Phone 手機程式

智慧型手機是一種在手機內安裝了相應開放式作業系統的手機，至2008年底約有4.5億部。通常使用的作業系統有：

**Android**, **Windows Mobile**, **iPhone OS**, Symbian, Linux, or Palm

3. 期中考 (30%)

4. 期末考 (30%)

# 2009 通訊大賽 (Mobileheroes) Android 手機軟體設計競賽

2009通訊大賽-Android手機軟體設計競賽 - Windows Internet Explorer

http://www.mobilehero.com/index.asp

檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

★ 2009通訊大賽-Android手機軟...

會員/參賽選手專區 | 加入會員 | 聯絡我們  
回首頁 | 友善連結 | 網站地圖

**2009通訊大賽**

Mobileheroes

Android 手機軟體設計競賽

最新消息 關於競賽 主辦單位 競賽主題 競賽時程 參賽方式 競賽階段 競賽說明會 交流論壇 我要報名

Android

最新消息

2009.08.14 2009通訊大賽決賽入圍名單公布!

2009.07.29 決賽入圍名單預定於8/31前公告

2009.07.29 近期將寄出確認收到郵寄文件通知信函

2009.07.14 7/22(三)前，記得郵寄實體文件至台北郵局9-16信箱

2009.07.14 明天7/15中午前記得上傳你的作品喔!

2009.07.08 決賽使用手機規格出爐! 歡迎下載

2009.06.24 參賽者有機會前至香港，在GSMA Mobile Asia Congress秀出作品喔!

2009.06.23 7/3 Andriod Develop Day 研討會，分享Andriod最新發展!

2009.06.20 新聞 | 亞洲五大電信業者聯手推動Android應用開發

2009.06.19 新聞 | Android軟體 工業局列入數位內容重點

NCP

經濟部工業局

經濟部通訊產業發展推動小組

FAREASTONE

Google

工業技術研究院  
Industrial Technology Research Institute

WMN Lab  
NTPUCSIE

訊工程學系  
formation Engineering

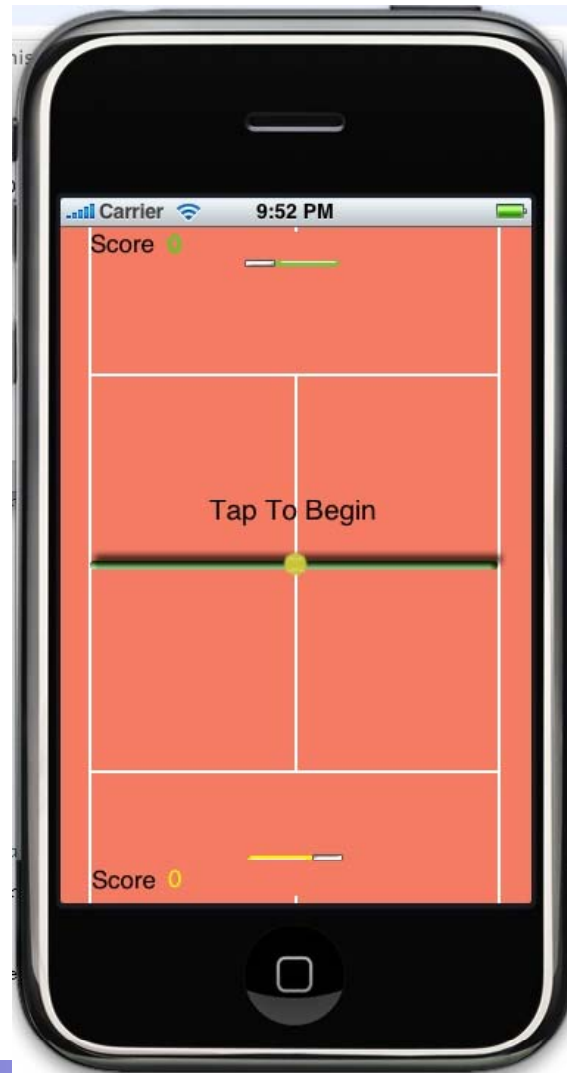
# Apple iPhone

- ⑩ iPhone平台為三大平台中螢幕解析度最大、G-sensor感應速度最為流暢之平台，但其Objective-C+Cocoa開發環境不同於一般的C++/Java平台，開發時必須熟悉其程式語言。



## Apple iPhone (Cont.)

### ⑩ Tennis



0.20

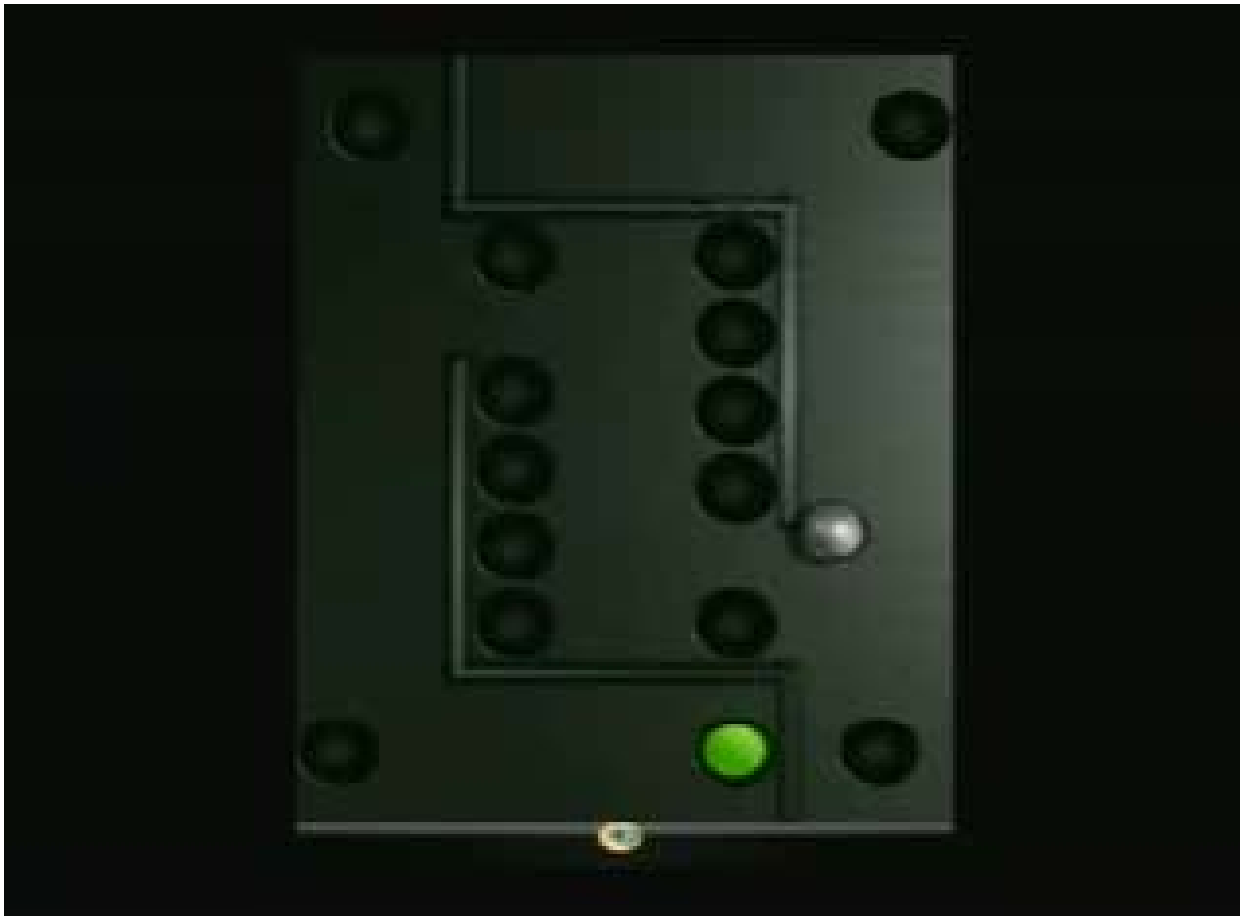
# Windows Mobile

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- ⑩ HTC Diamond (Windows Mobile)平台為三大開發平台中最易開發之環境，其可直接利用C++/C# 進行開發，程式語言的開發運用容易上手為其優勢。
- ⑩ 此平台之G-Sensor感測表現為三大平台中最差，整體程式執行效率也不甚理想，其效率問題為其最大之缺點。

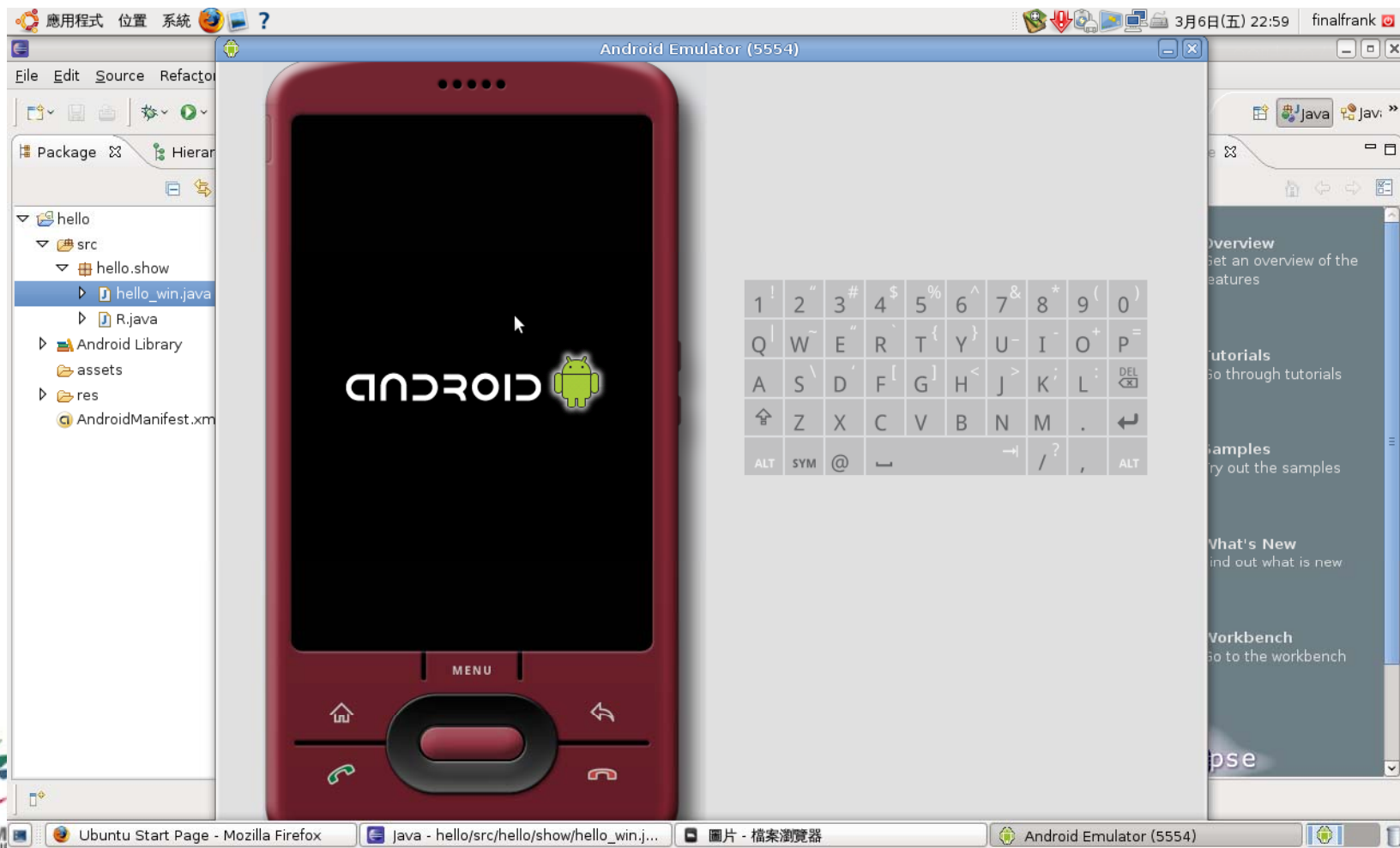
## Windows Mobile (Cont.)

### ⑩ Teeter

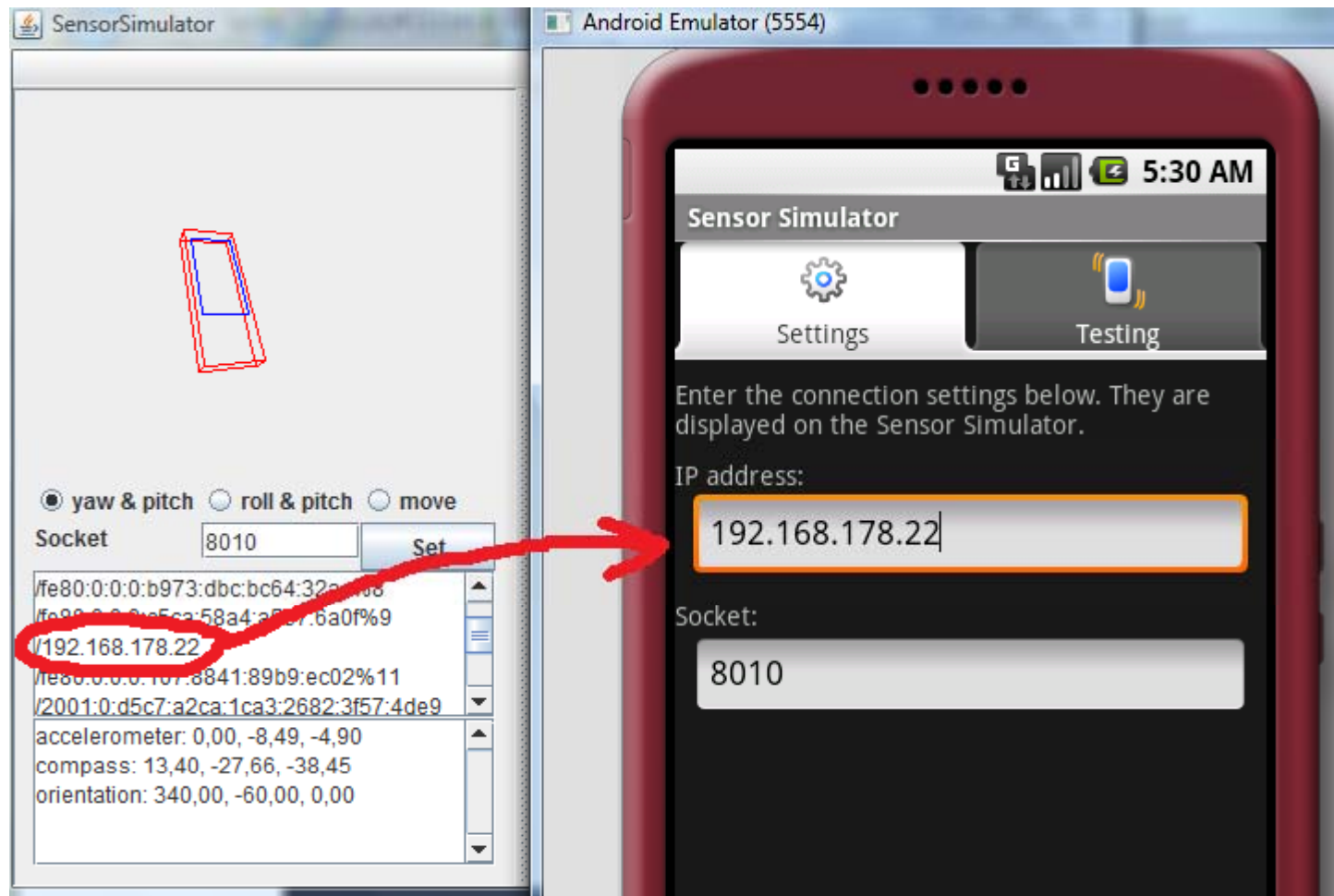


# Android

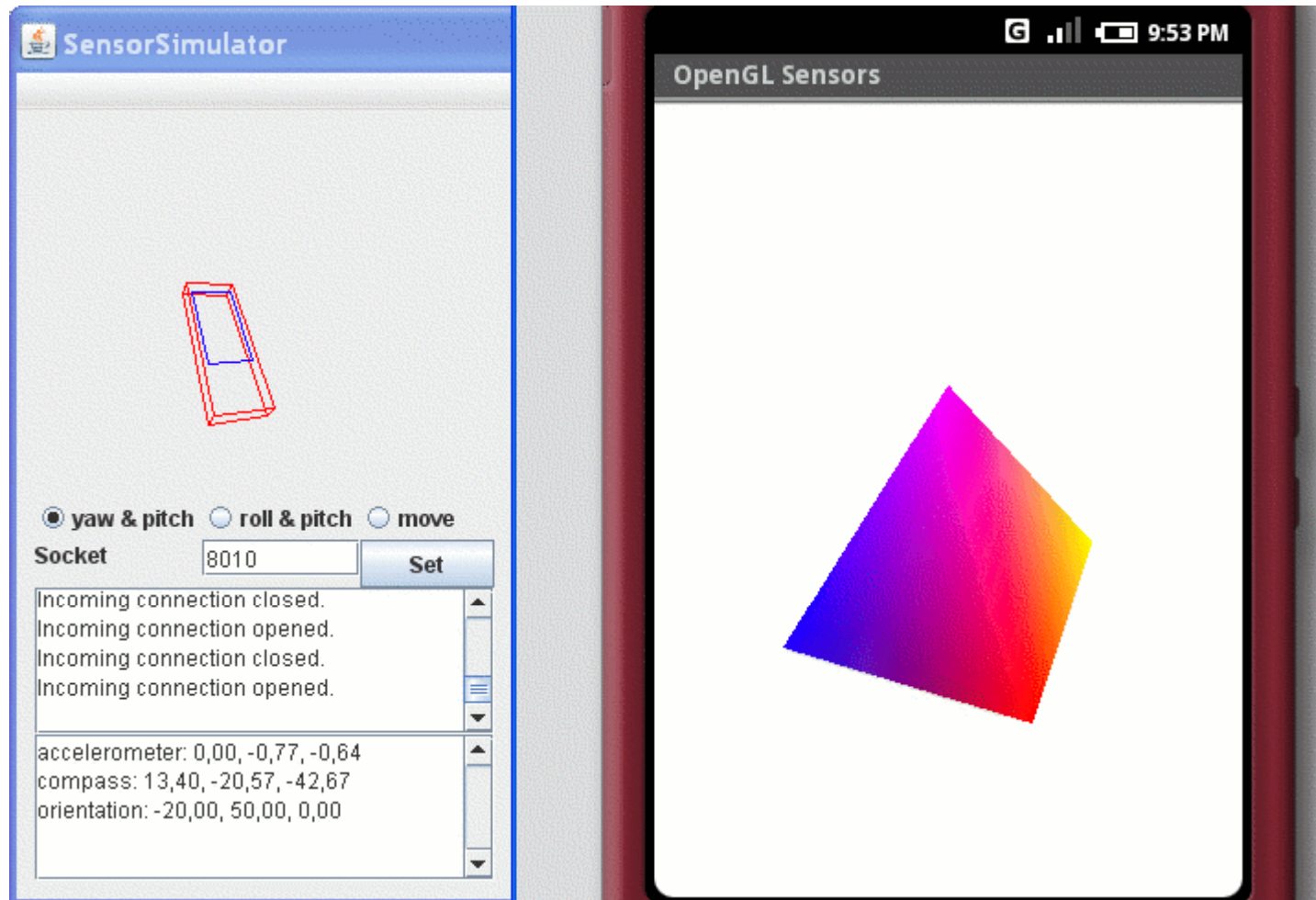
- ⑩ HTC Magic (Android)在三大平台中表現最為平均，其使用Java程式語言作為其主要開發語言，同時G-Sensor感測表現也相當優異。



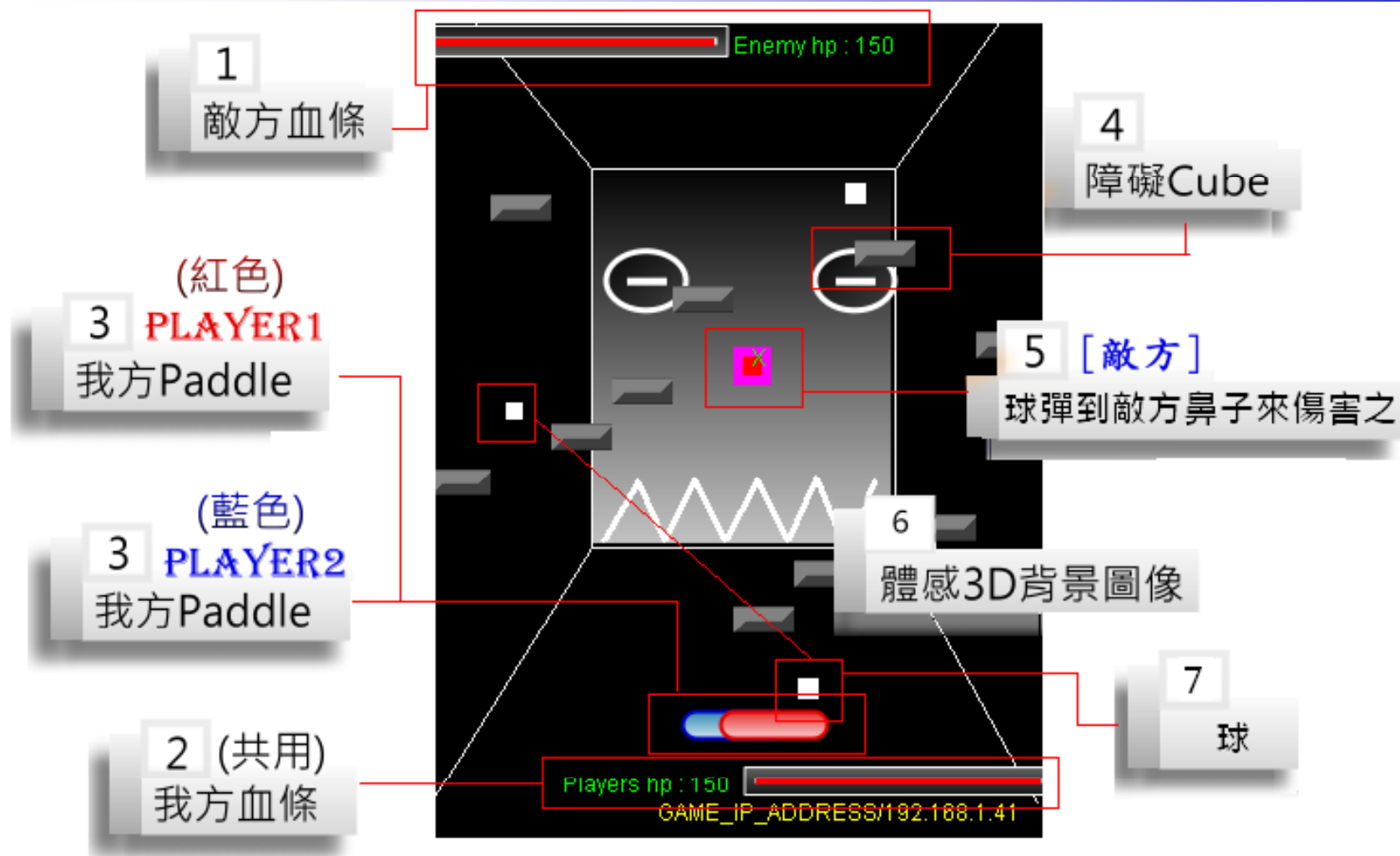
## Android (Cont.)



## Android (Cont.)



# Term Project: 高互動體感手機程式



畫面底部會顯示IP，省去玩家自行查詢的步驟，增加遊戲普及性

26

## 操作模式(一)



