
Introduction to Wireless Networks

Syllabus

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課程內容大綱

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 4G and ALL-IP Networks

Chapter 8: Introduction to Mobile Ad Hoc Networks

Chapter 9: Introduction to Wireless Sensor Networks

Chapter 10: Introduction to WiMax (IEEE 802.16)

Chapter 11: Introduction to IEEE 802.22

Chapter 12: Introduction to Mobility Issues

Fourth-generation wireless technologies

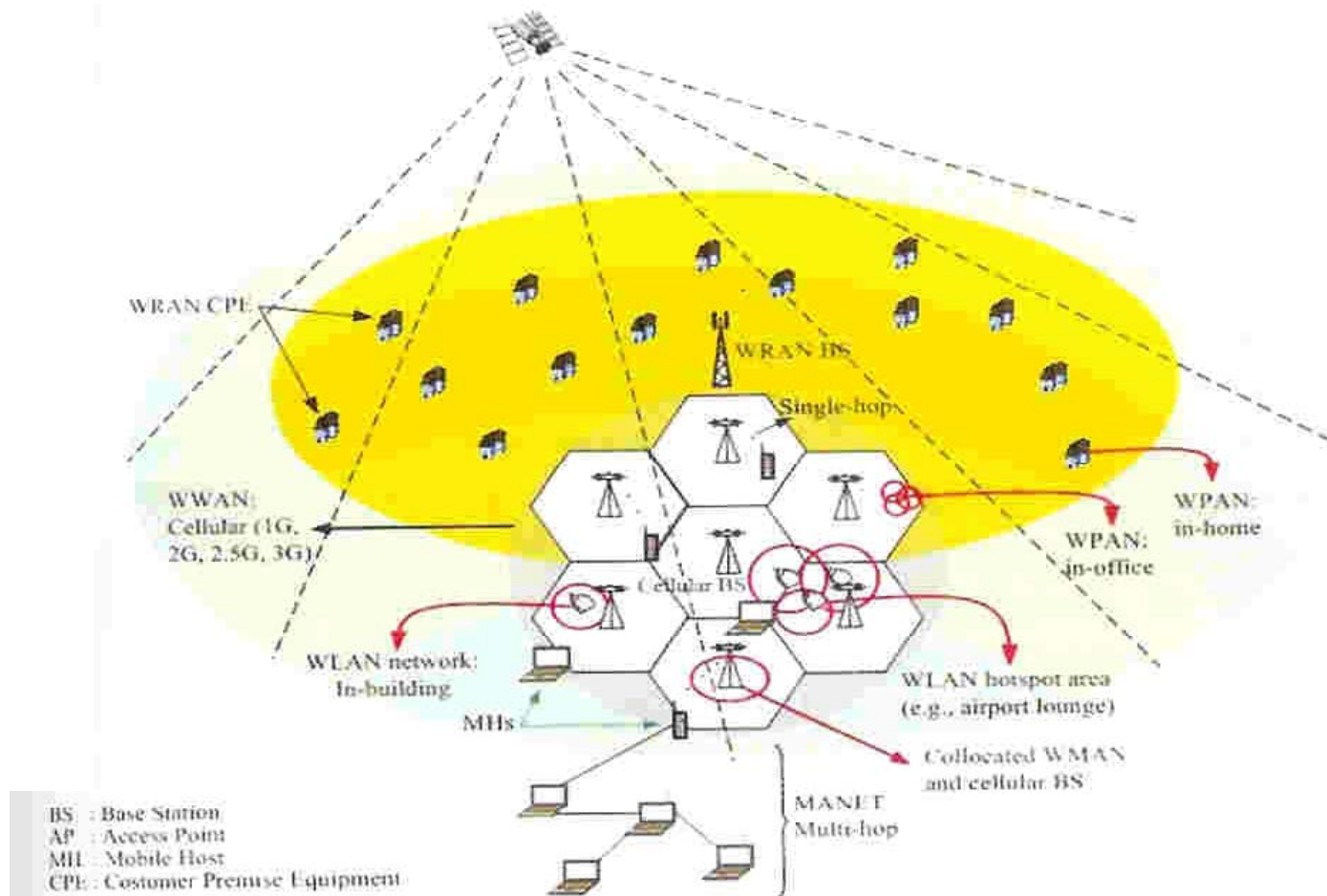


Figure 1.2 – The envisioned communication puzzle of 4G and beyond

The Communication Puzzle

Fourth-generation wireless technologies include

- ❑ Wireless Personal Area Networks
 - Wireless PANs or WPANs
- ❑ Wireless Local Area Networks
 - Wireless LANs or WLANs
- ❑ Wireless Metropolitan Area Networks
 - Wireless MANs or WMANs
- ❑ Wireless Regional Area Networks
 - Wireless RANs or WRAN
- ❑ Cellular wide area network
- ❑ Satellite network

The scope of various wireless technologies

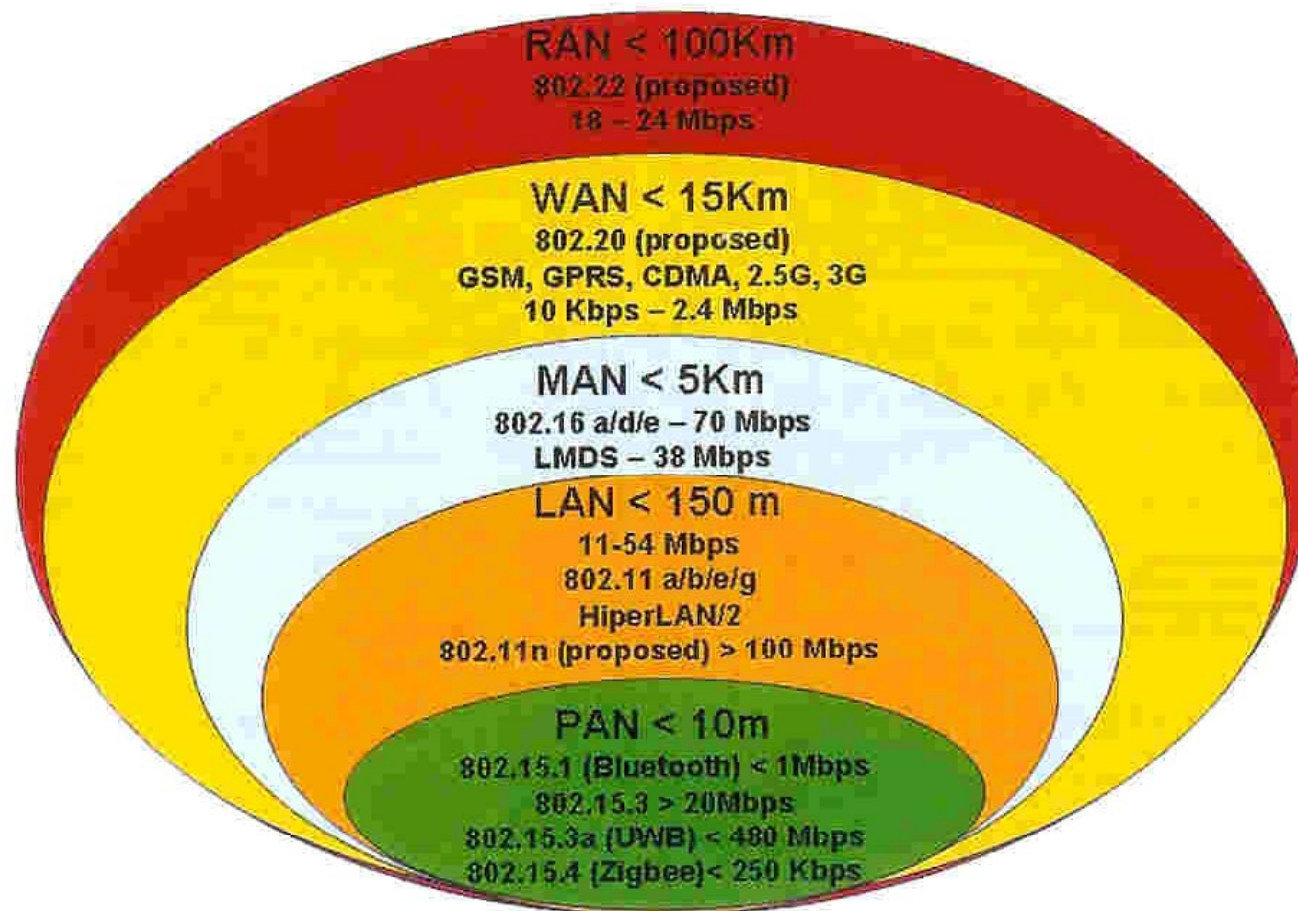
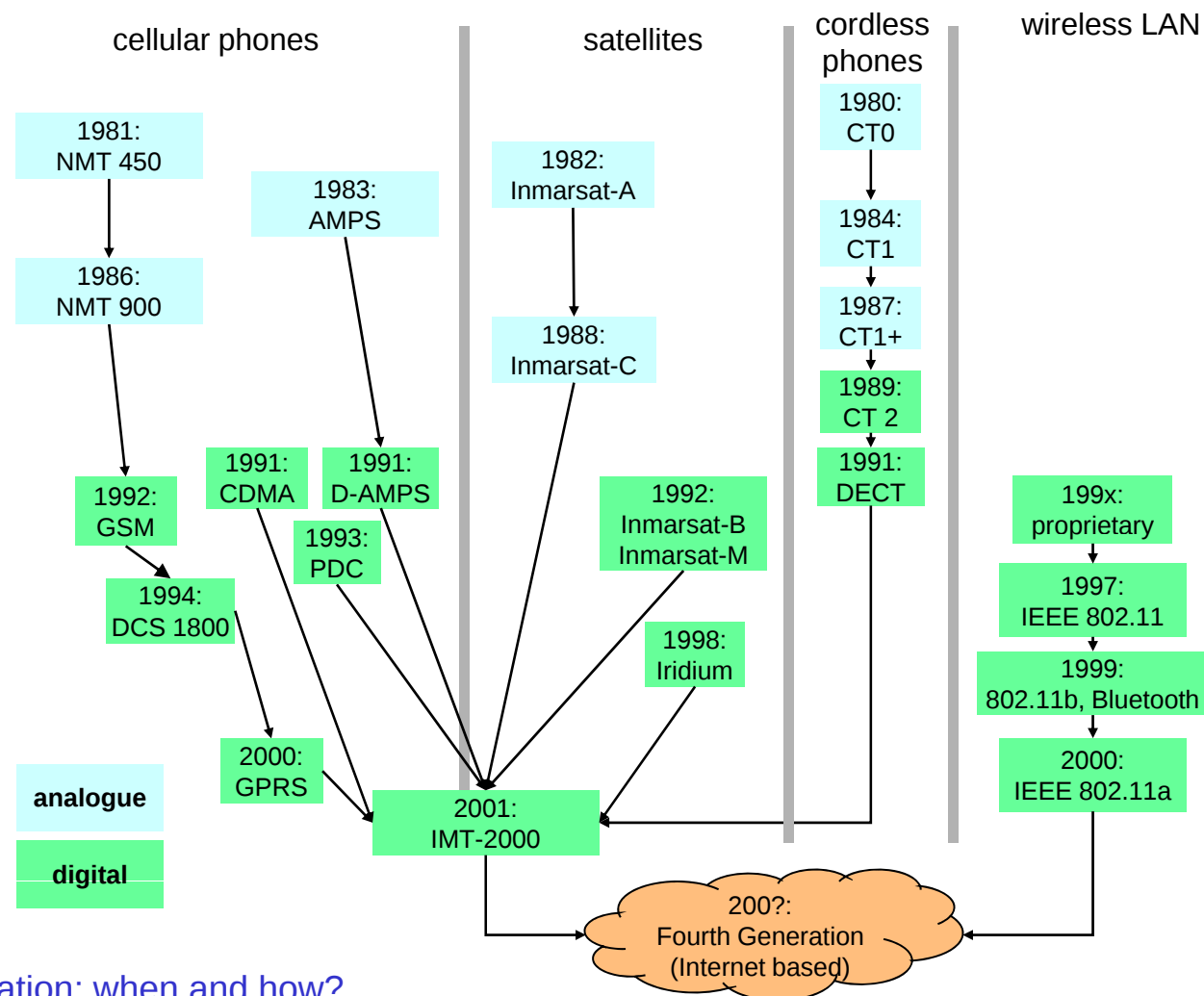


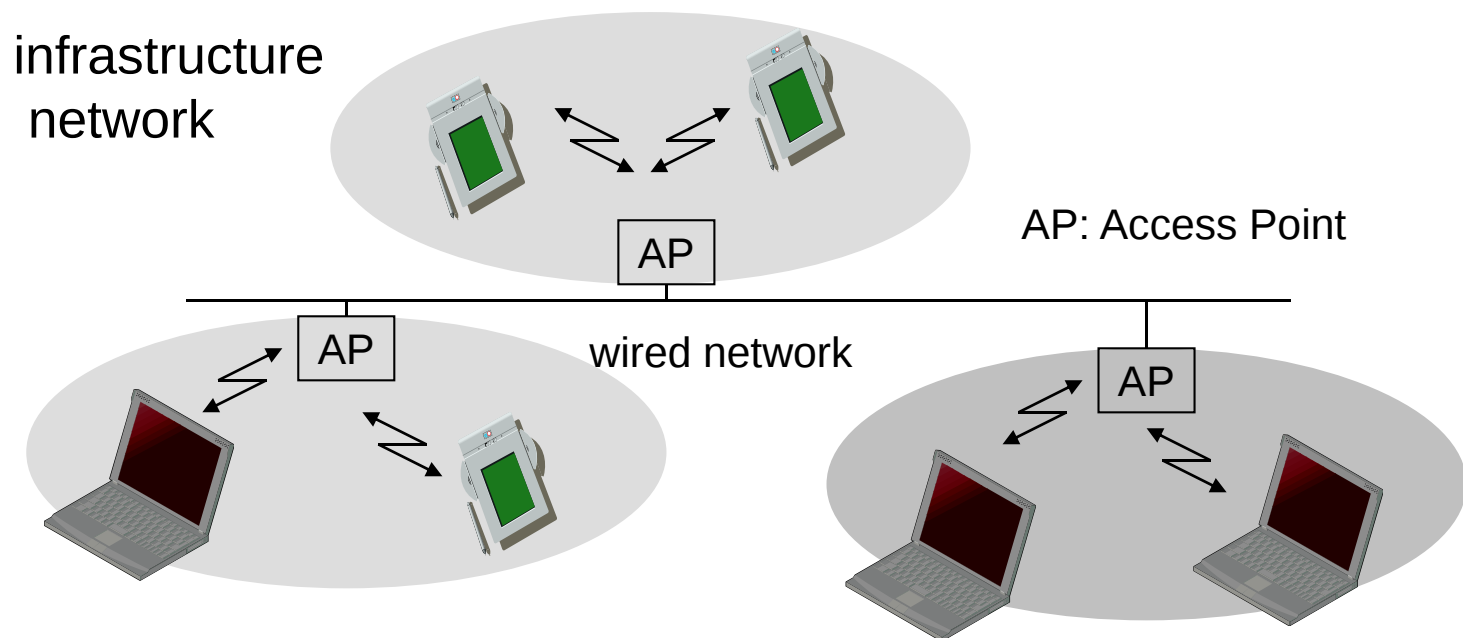
Figure 1.3 – The scope of various wireless technologies

Wireless systems: overview of the development

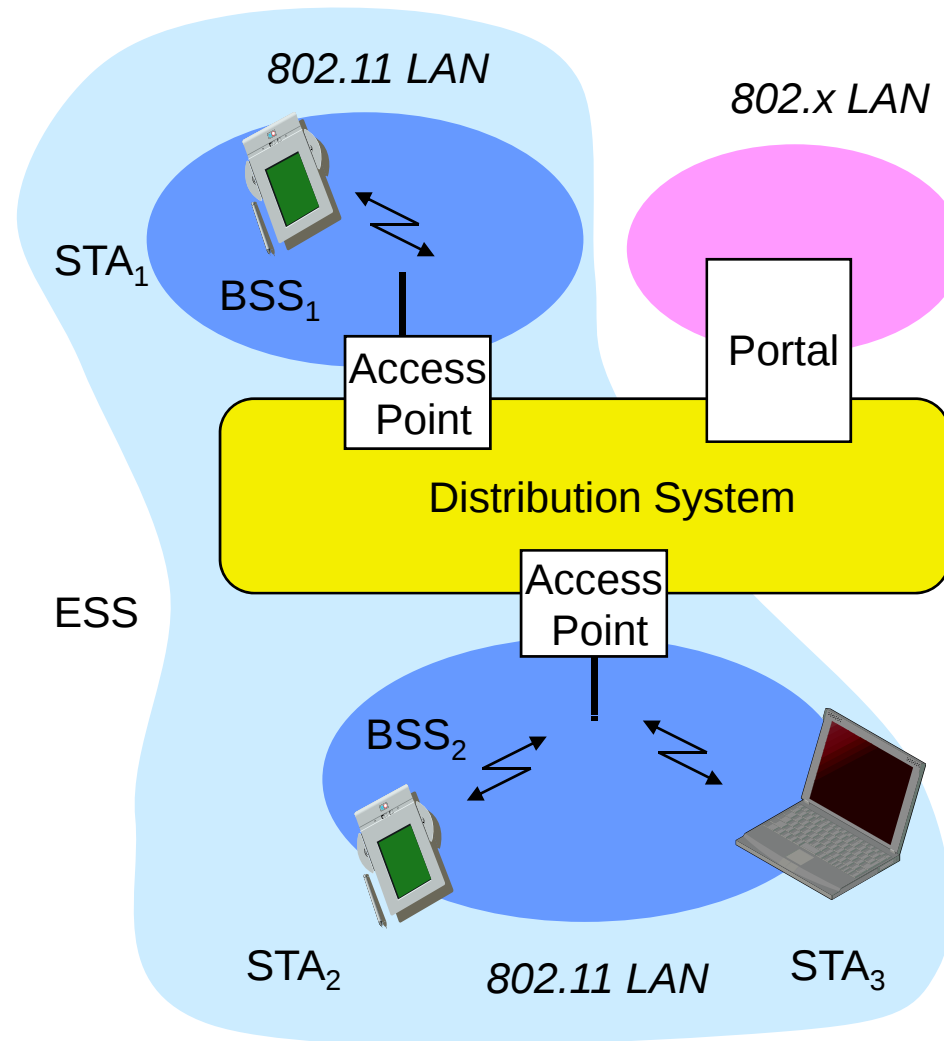


4G – fourth generation: when and how?

Chapter 1: Introduction to Wireless Local Area Networks



Chapter 2: Introduction to IEEE 802.11



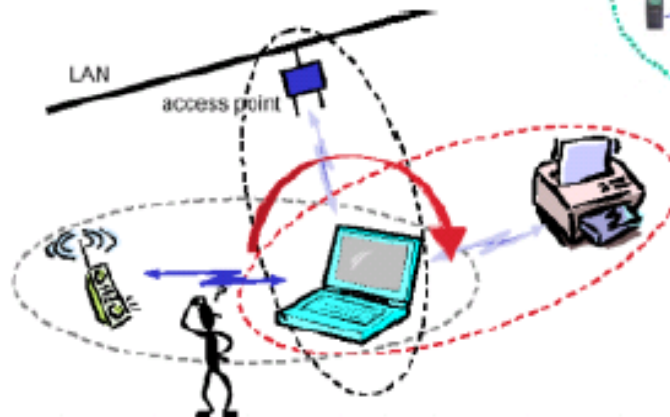
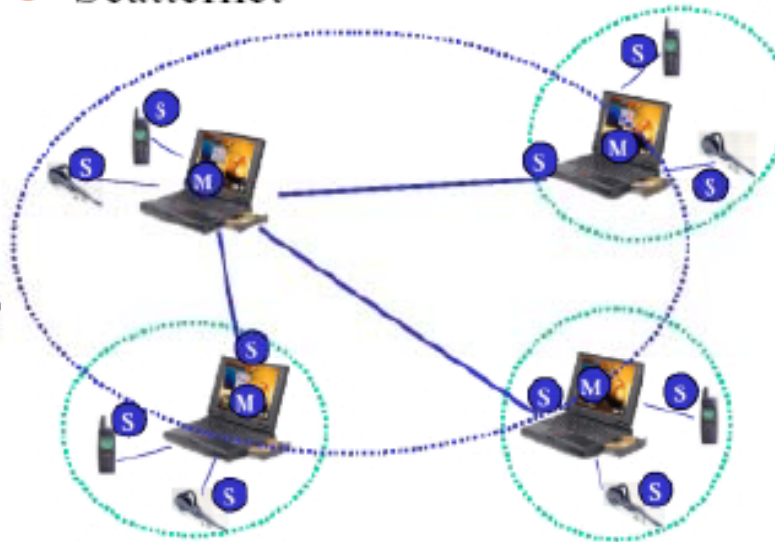
Chapter 3: Introduction to Bluetooth

Bluetooth Network

- Piconet



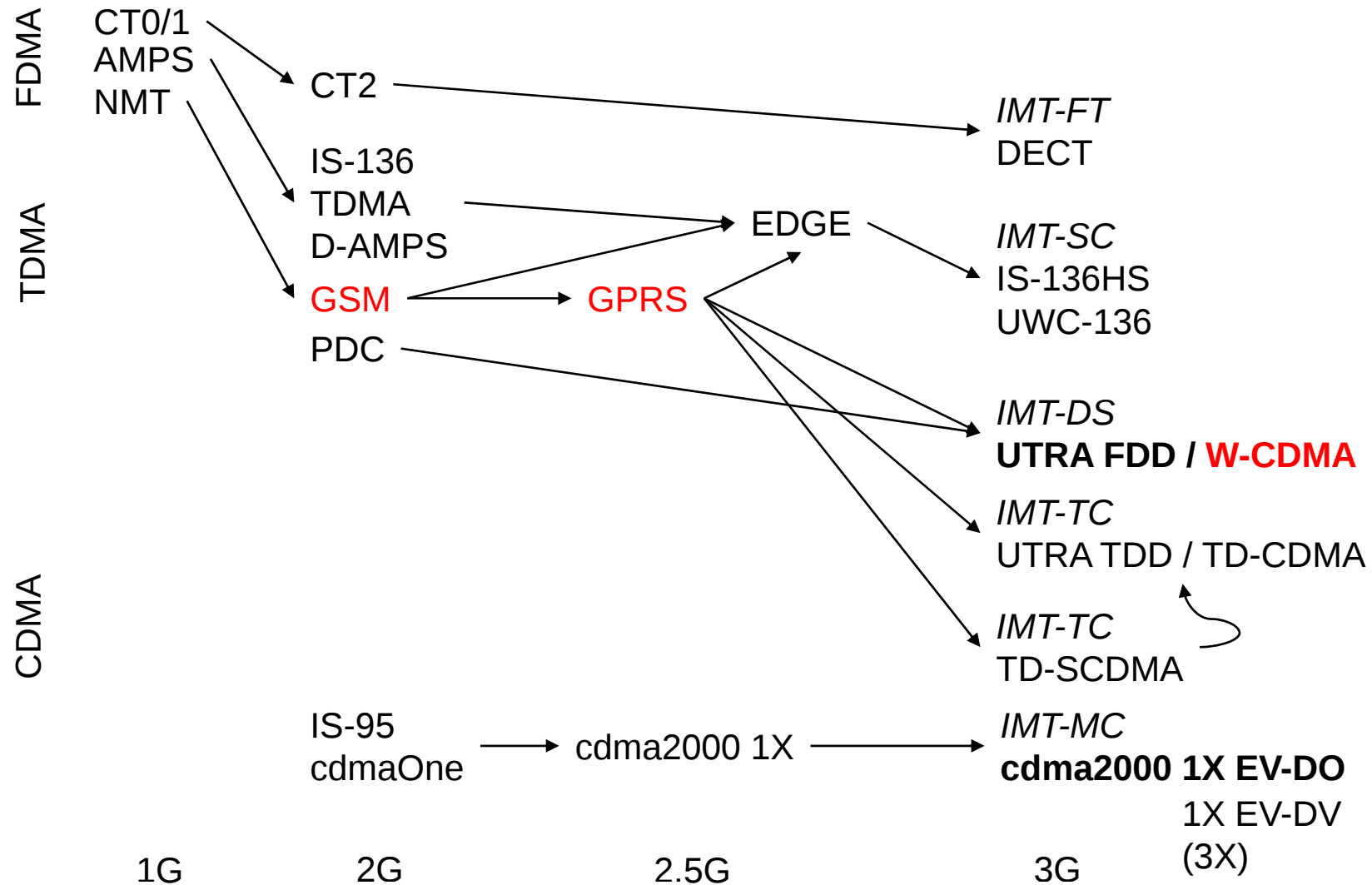
- Scatternet



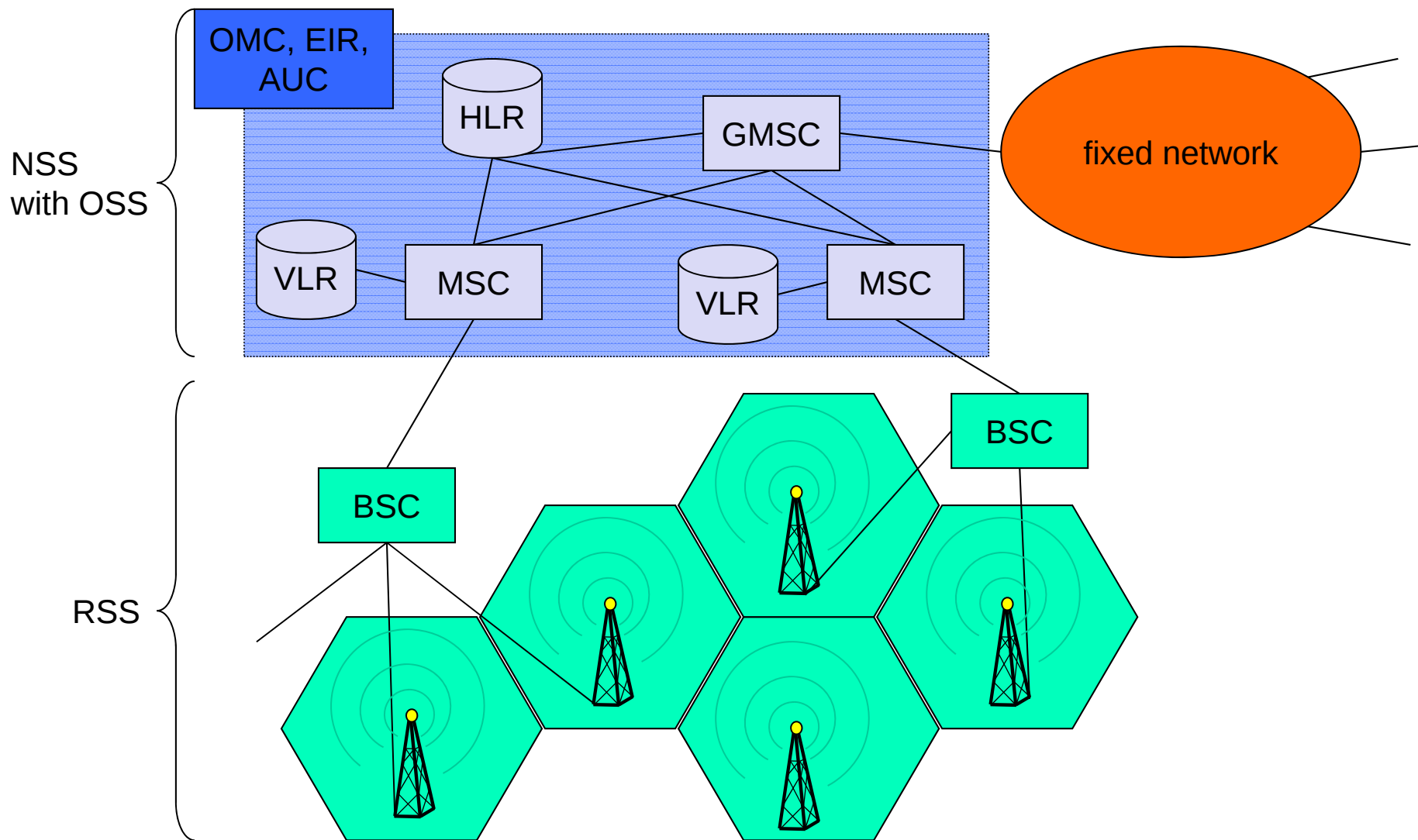
How to jump efficiently between piconets?

Delay sensitive applications?

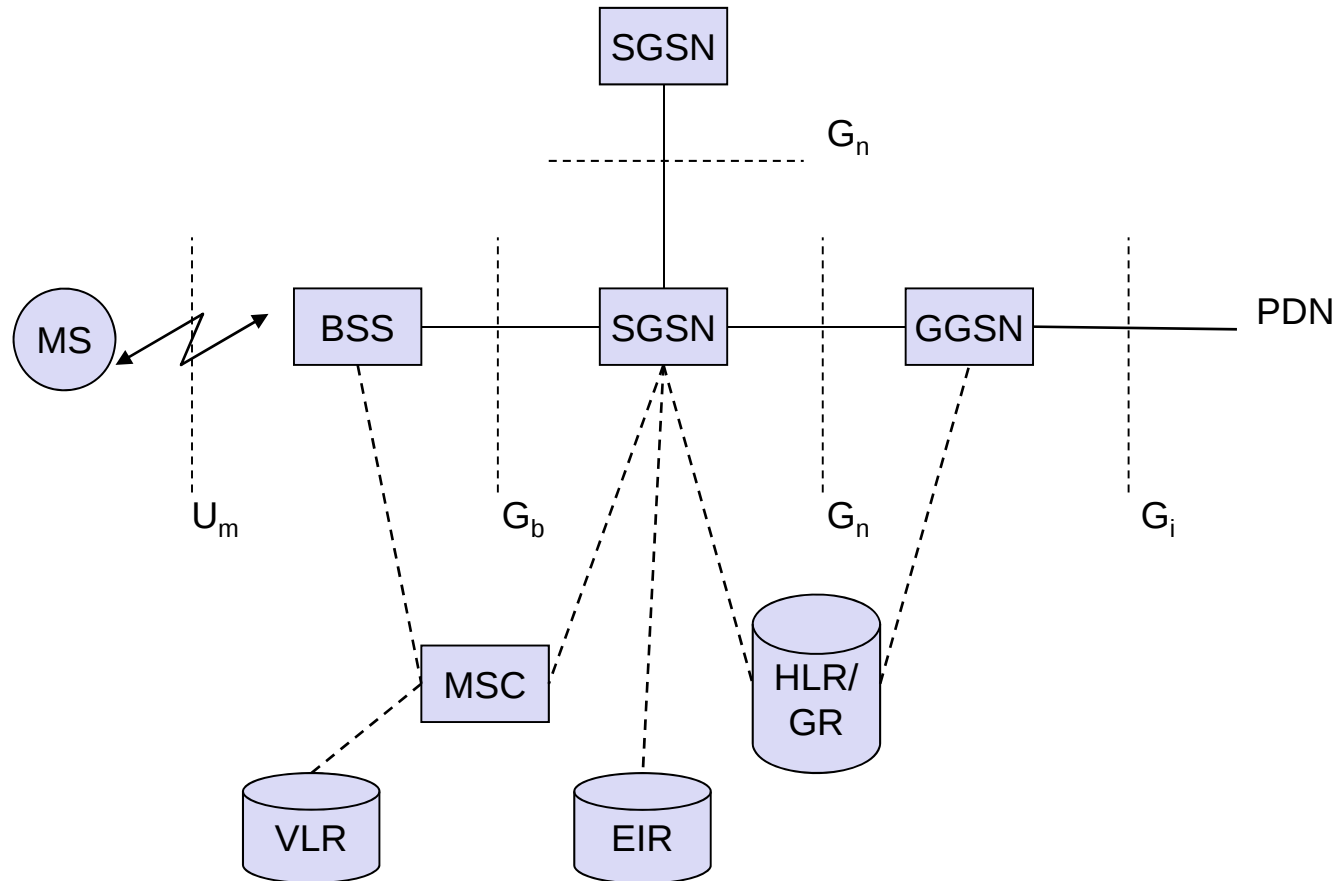
Development of mobile telecommunication systems



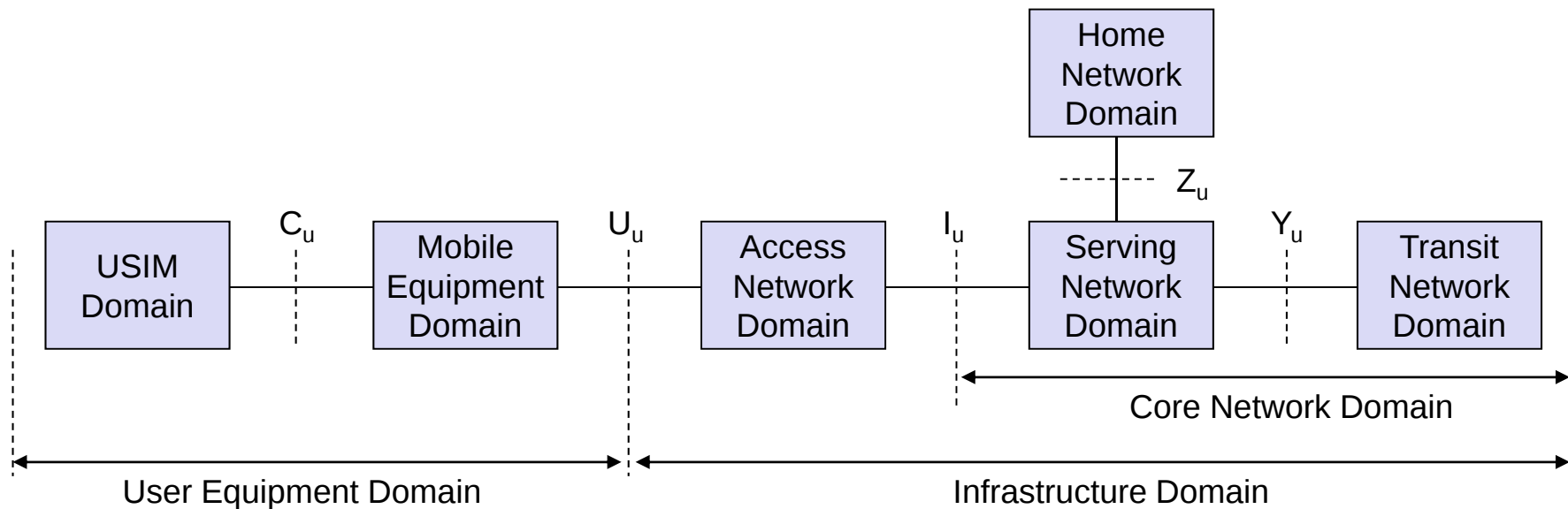
Chapter 4: Introduction to GSM



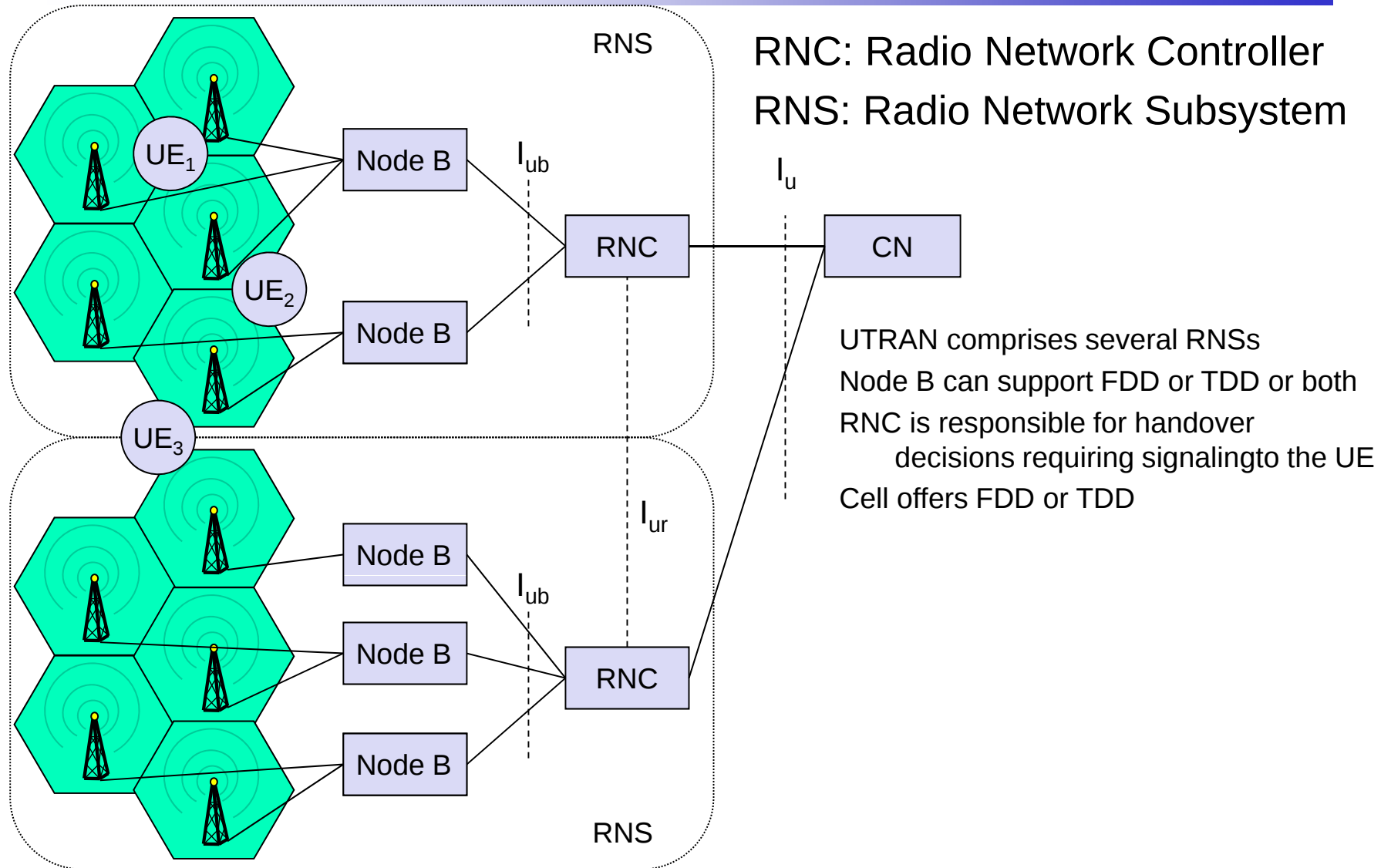
Chapter 5: Introduction to 2.5G (GPRS)



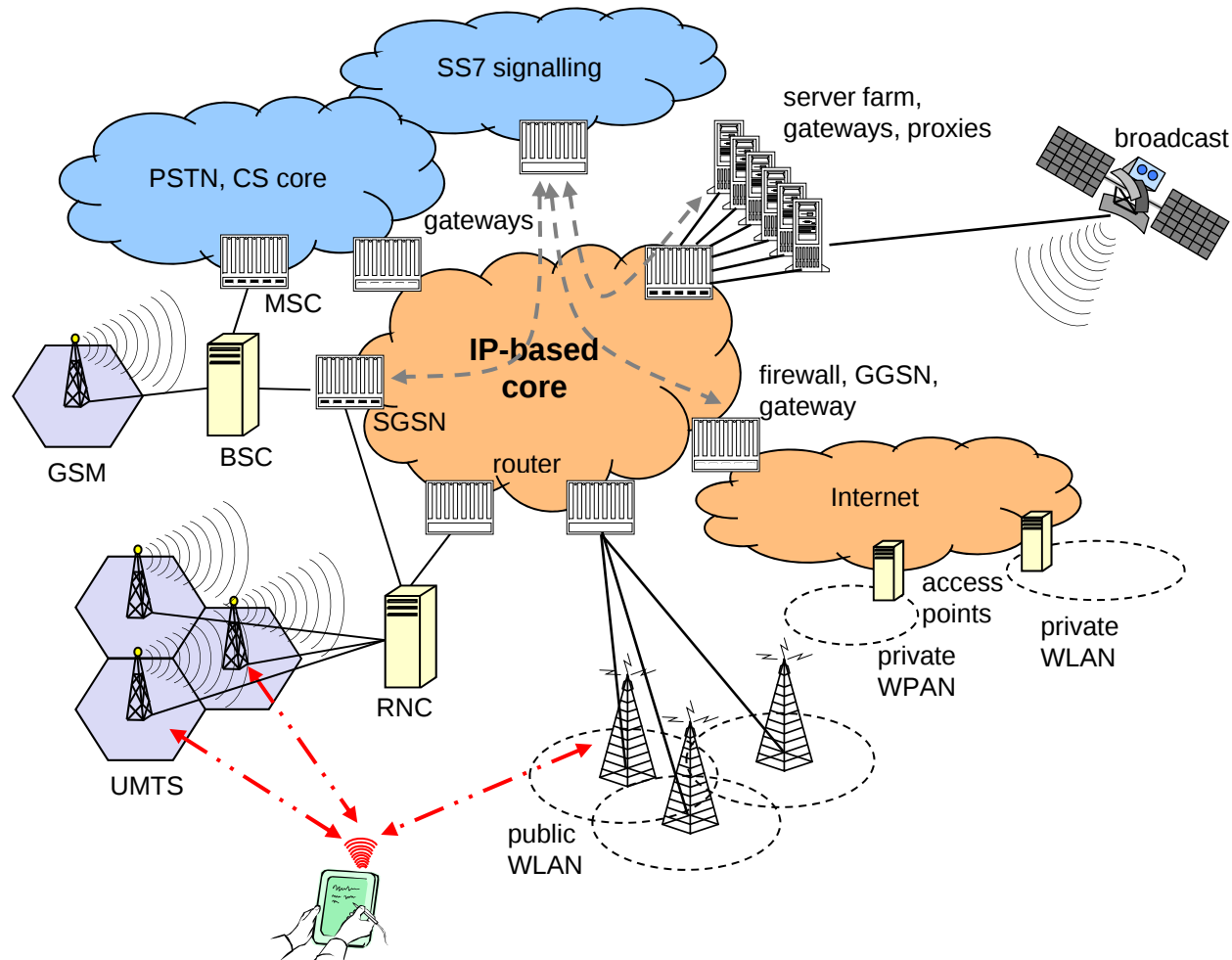
Chapter 6: Introduction to 3G (WCDMA)



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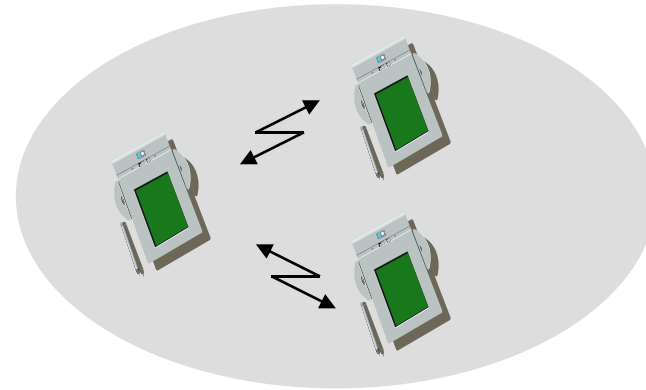
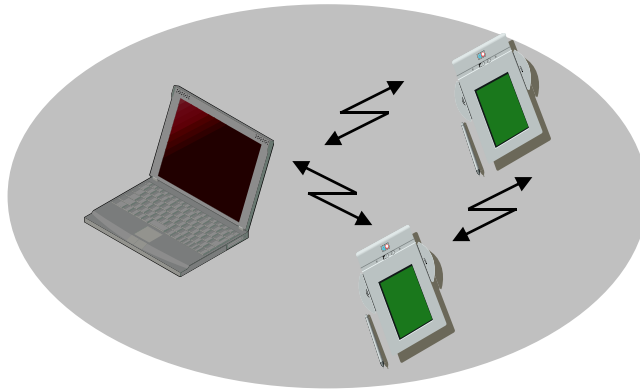


Chapter 7: Introduction to 4G and ALL-IP Networks



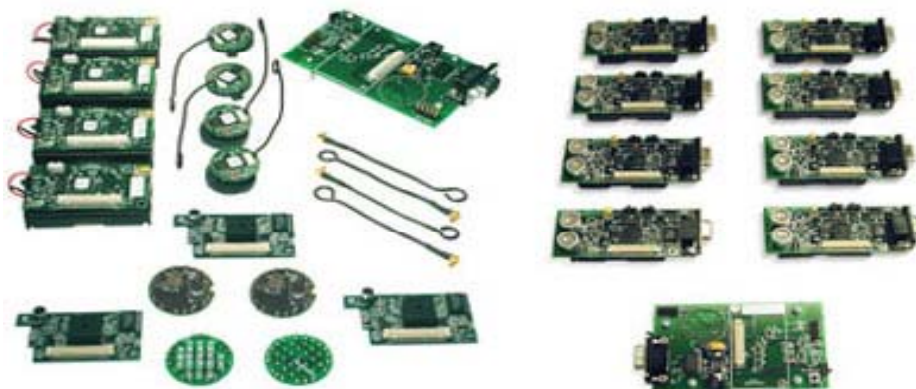
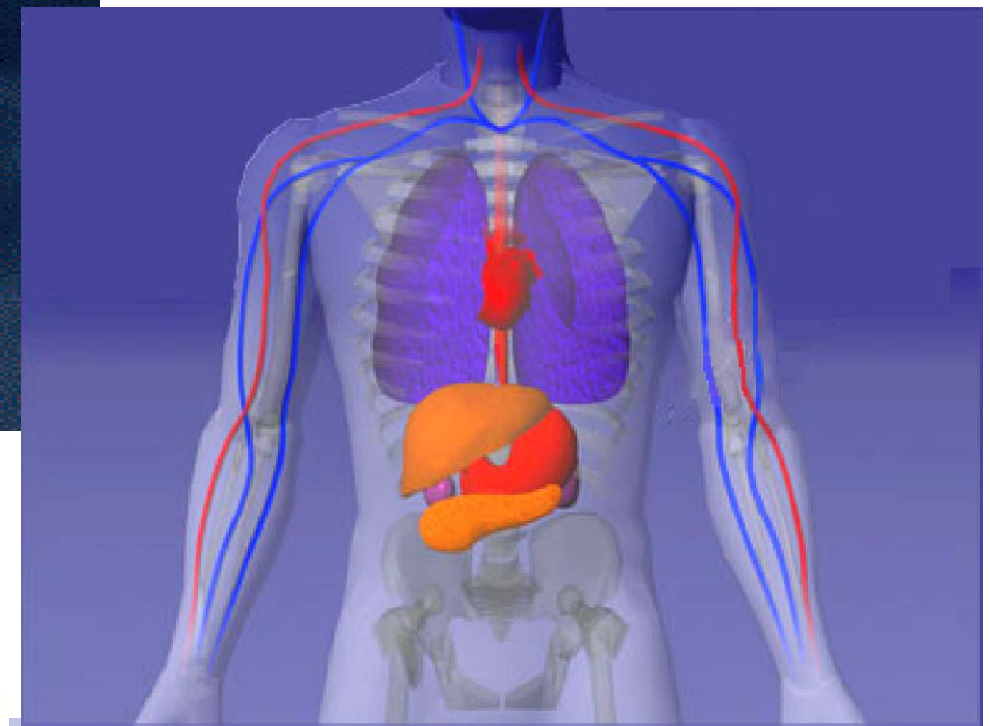
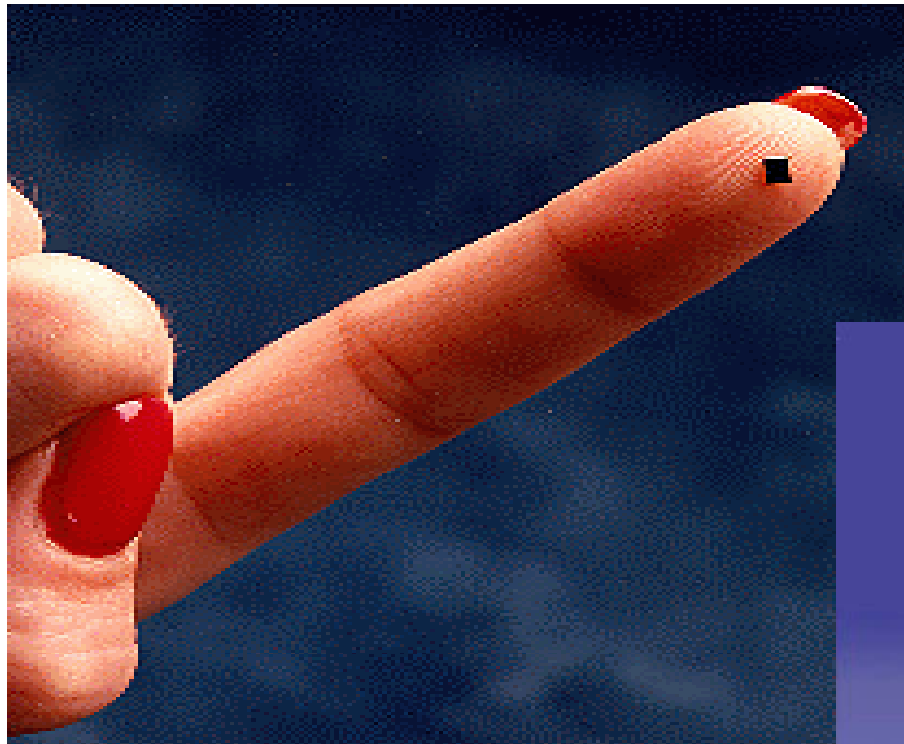
Chapter 8: Introduction to Mobile Ad Hoc Networks

ad-hoc network



Chapter 9: Introduction to Wireless Sensor Networks

Example of Wireless Bio-Sensor



Chapter 10: Introduction to WiMax (IEEE 802.16)

IEEE 802.16, WiMAX WMAN Resource Center - Microsoft Internet Explorer

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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.
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[WiMAX Forum](#)
16 Oct 2007
Taipei, Taiwan

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Chapter 11: Introduction to IEEE 802.22

The screenshot shows a Microsoft Internet Explorer window titled "IEEE 802.22 WRAN WG Website - Microsoft Internet Explorer". The address bar displays "http://www.ieee802.org/22/". The page content includes the IEEE 802 logo, the text "IEEE 802 LAN/MAN Standards Committee", and "802.22 WG on WRANs (Wireless Regional Area Networks)". A left sidebar contains a list of links: "Documentation Requirements", "Meeting Documents", "Members Only Documents", and a list of sub-committees from 802.11 WLAN to 802.22 WRAN Homepage. The main content area has a heading "Introduction" followed by two paragraphs of text. The bottom of the browser window shows the Windows taskbar with the Start button, several open applications, and the system clock showing 20:24 Monday.

IEEE 802.22 WRAN WG Website - Microsoft Internet Explorer

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IEEE 802 LAN/MAN Standards Committee
802.22 WG on WRANs (Wireless Regional Area Networks)

Introduction

The charter of IEEE 802.22, the Working Group on Wireless Regional Area Networks ("WRANs"), under the [PAR](#) approved by the IEEE-SA Standards Board is to develop a standard for a cognitive radio-based PHY/MAC/air_interface for use by license-exempt devices on a non-interfering basis in spectrum that is allocated to the TV Broadcast Service.

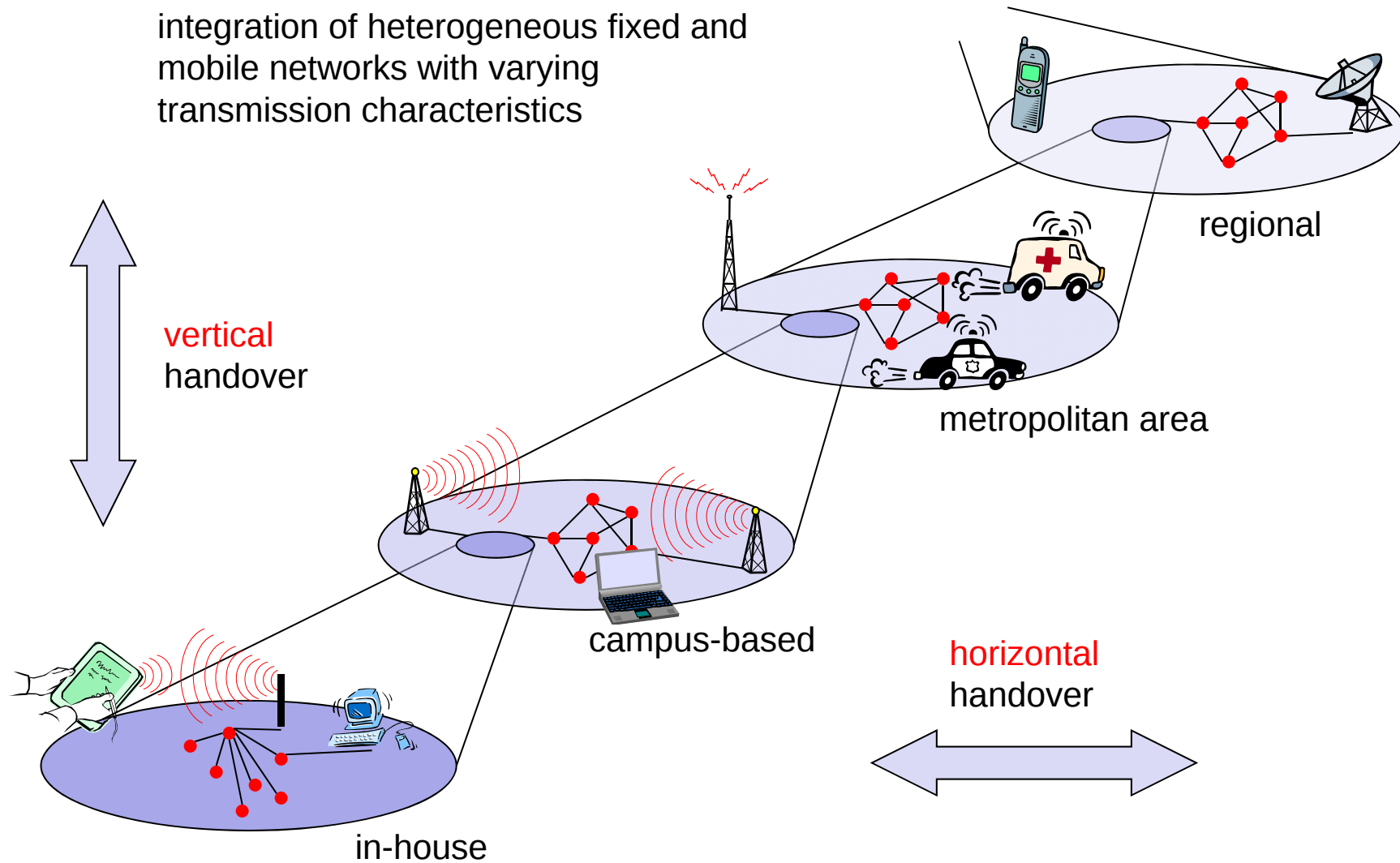
Meeting documents will be posted, on a per meeting basis, on this website, as soon as possible after the conclusion of meetings, and will be available via an index under the "Meeting Documents" link in the link bar at the left of this page.

The "Members Only" directory, with password protection, under the "Members Only Documents" tab in the link bar, has been updated to

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Chapter 12: Introduction to Mobility Issues

integration of heterogeneous fixed and mobile networks with varying transmission characteristics



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