MCA253 - Mobile Applications

Introduction to Mobile Applications, J2ME

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Purpose of Mobile Technology

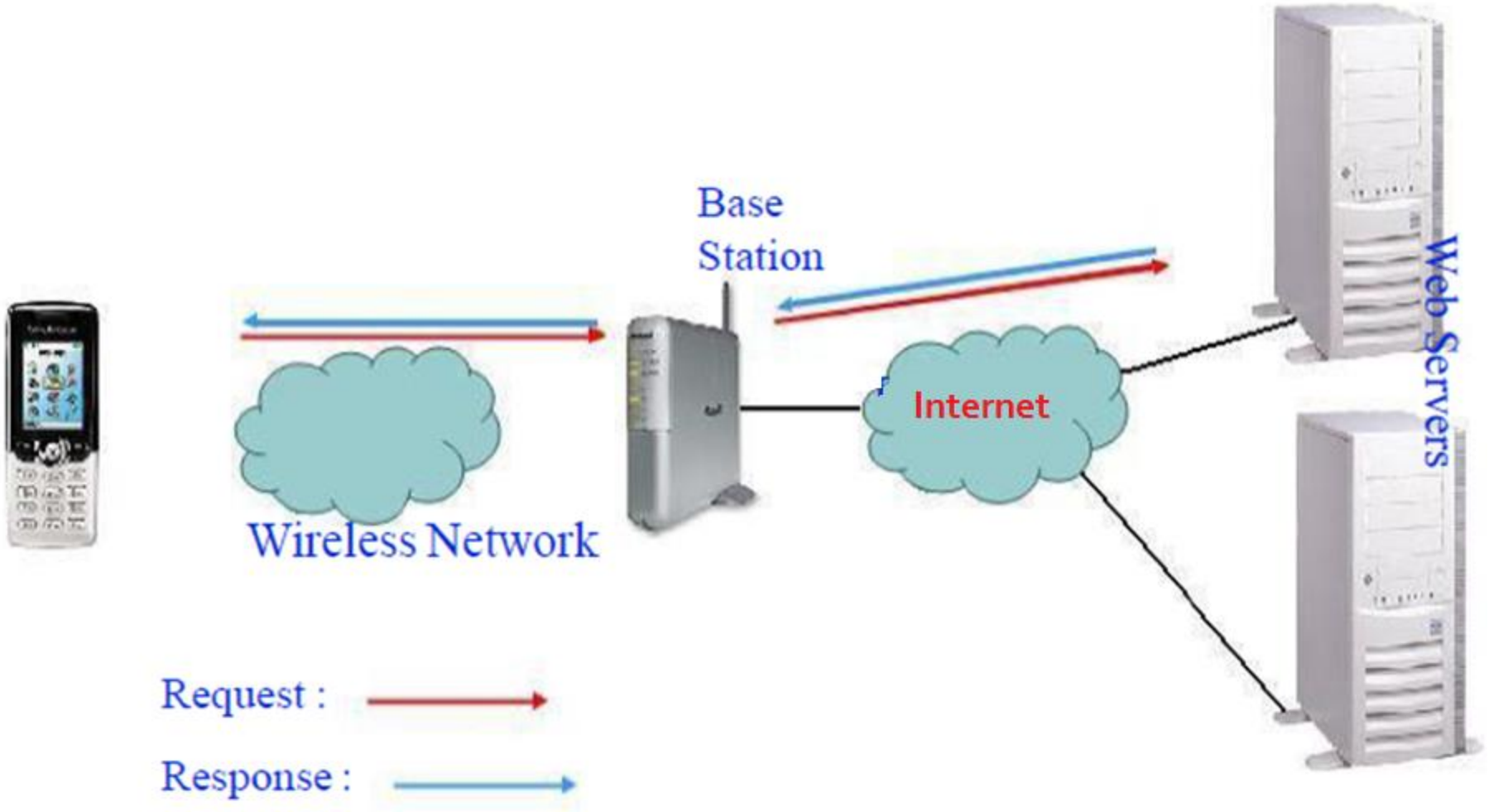
"Anything, Anytime, Anywhere"

- Connecting People
- Information sharing
- Internet access – from Urban to Rural
- Entertainment
- Services at finger tips

Introduction to Mobile

- Notebooks
- Palmtops*
- *PDA's – Personal Digital Assistant
- Phones
- Tablets
- Cash Chests – scanner, display
- POS (Card swiping)
- Medical devices (Glucometer, Oxymeter, …..)

The Scenario



Cellular Telephone Networks

- A cellular telephone network comprises mobile transceivers, called cellular telephones, and a network of fixed transceivers, called base stations, that are strategically positioned along the terrain.
- Base stations are used to connect cellular telephones to the ground-based telephone system.
- There are two kinds of cellular networks: analog and digital.
- Cellular telephone networks then became capable of transmitting both voice and data.
- The transmission range of a cellular telephone is determined by the strength of the battery powering the phone and the location of the nearest base station.
- Transmission from a cellular telephone is broadcast 360 degrees and is received by a base station closest to the cellular telephone.

Cellular Telephone Networks

- Cellular telephone networks are designed so that the signal is automatically transferred to the next closest base station using a technique called a hand-off: the connection between the cellular telephone and the cellular telephone network is dropped for a fraction of a second, the cellular telephone moves between base stations, and the next base station reestablishes the signal.
- The area covered by a base station is called a cell.
- The split-second gap during the hand-off goes unnoticed most times, as long as cells are near each other.
- The hand-off doesn't have a negative effect on voice communications because persons on the call adjust for the slight break in communication
- Digital cellular telephone networks trap and correct errors
- Digital cellular telephone networks transmit information in small packets, called frames or cells.

Cellular Telephone Networks

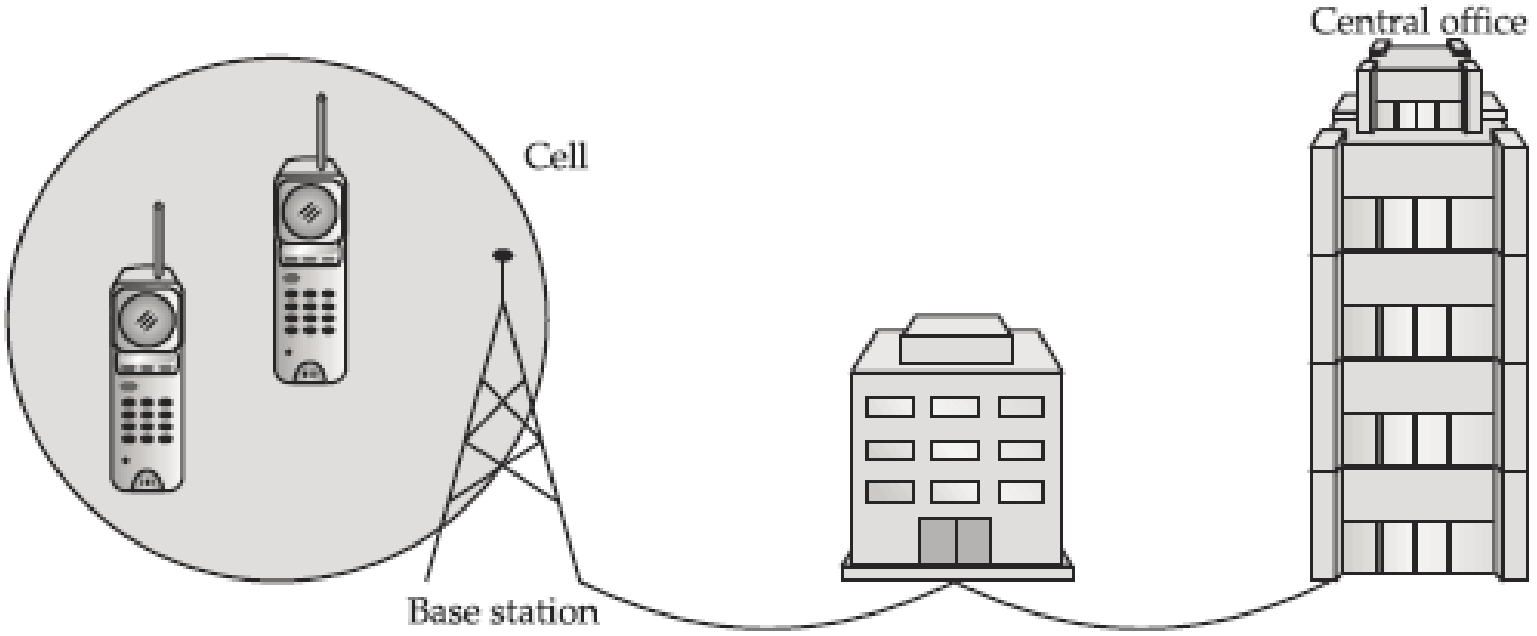


Figure 2-10. *Fixed transceivers called base stations form a communications cell.*

Digital Wireless Transmissions

- A digital cellular telephone network can transmit both voice and data simultaneously using multiplex transmission.
- There are three multiplex transmission methods used on a digital cellular telephone network: Code Division Multiple Access (CDMA), Time Division Multiple Access (TDMA), and a X-generation wireless standard called 3G/4G/5G.
- CDMA uses spread-spectrum transmission to use multiple communications channels for transmission, which dramatically increases data throughput over the network.
- The cellular telephone temporarily uses on-board memory in transceivers to store data to keep transmissions flowing during a hand-off.
- This is called a soft hand-off. TDMA uses one communications channel shared among transmissions by using time slots.

Digital Wireless Transmissions

- Transmission time is divided into time slots, and then each packet is assigned to a time slot.
- The 3G multiplexing technique uses either CDMA or TDMA to increase the throughput to 56 kilobits per second.

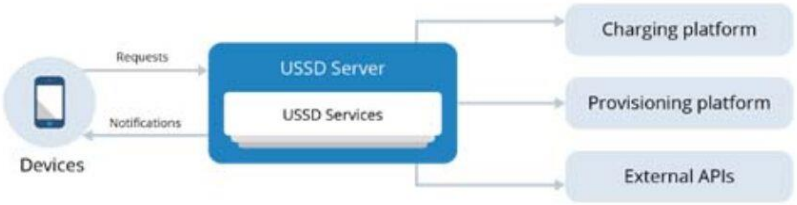
Messaging

- One of the first popular
pager.
- A pager displays any s
- Technically, the series
number and implied that t
- Practically, the series
caller and the receiver ag
- Today's wireless mobil
services that enable short
device that has access to the service.
- Cellular telephone companies offer three types of mes g services: Short Message Service (SMS), Cell Broadcast Service (CBS), and Unstructured Supplementary Services Data (USSD).

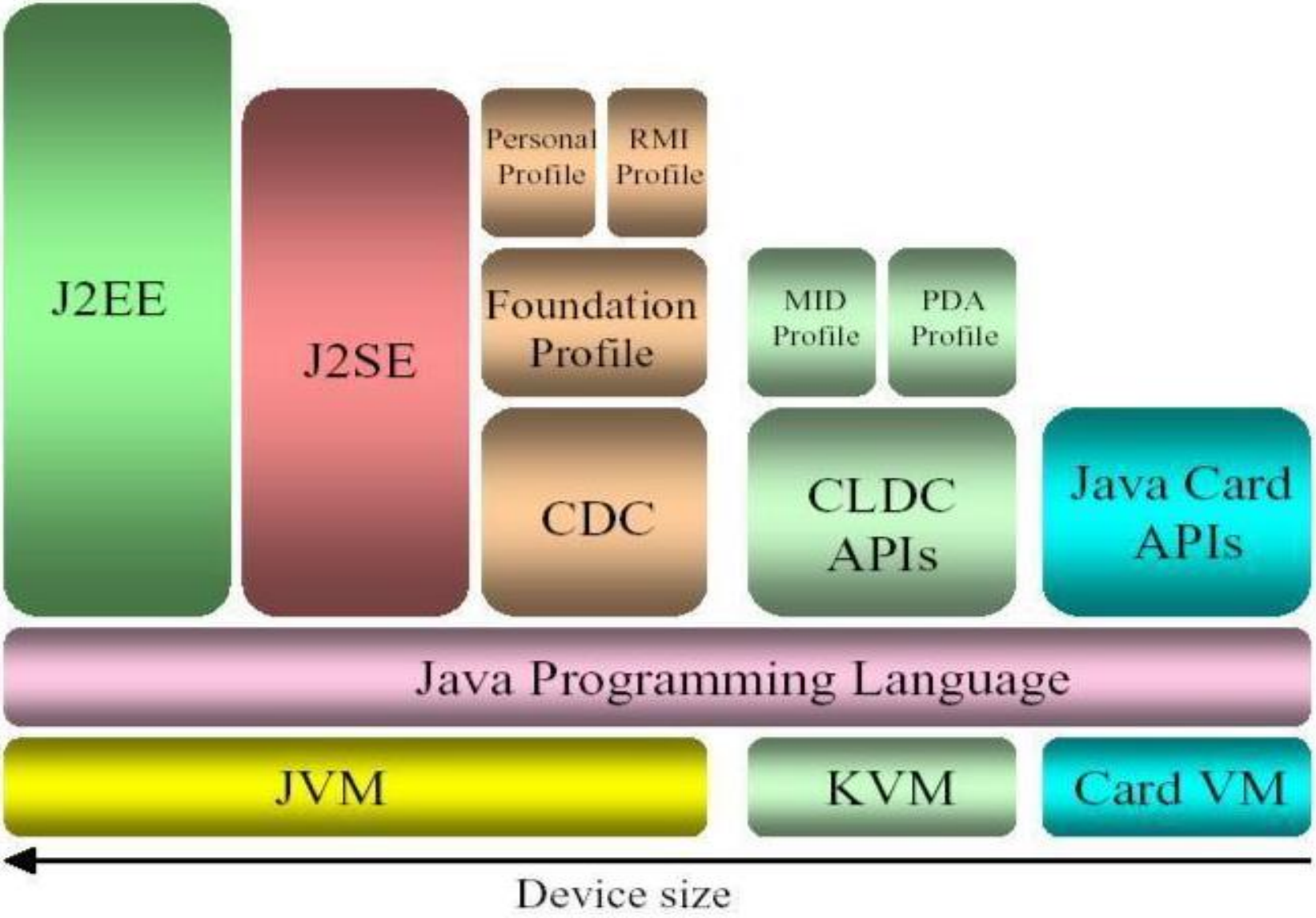
Cell Broadcast Service is a type of text message similar to an SMS message that can be sent to all cell phone users in a given area. The typical use for these kinds of messages is to send emergency alerts to mobile users. Cell Broadcasts are part of the GSM standard.

USSD (Unstructured Supplementary Service Data) is a Global System for Mobile(GSM) communication technology that is used to send text between a mobile phone and an **application** program in the network. **Applications** may include prepaid roaming or mobile chatting.

USSD FULL FORM



Java – The Big Picture



J2ME Configuration

Configuration: Two Types

- Connected Limited Device Configuration (CLDC)
- Connected Device Configuration (CDC).

Connected Limited Device Configuration (CLDC)

- Designed for 16-bit or 32-bit small computing devices with limited amounts of memory.
- Usually have between 160KB and 512KB of available memory and are battery powered.

Connected Limited Device Configuration (CLDC)

- Use an inconsistent, small-bandwidth network wireless connection and may not have a user interface.
- Use the KJava Virtual Machine (KVM) implementation, which is a stripped-down version of the JVM.
- CLDC devices include pagers, personal digital assistants, cell phones, dedicated terminals, and handheld consumer devices with between 128KB and 512KB of memory.