QUALCOMM INSTITUTE | UC San Diego

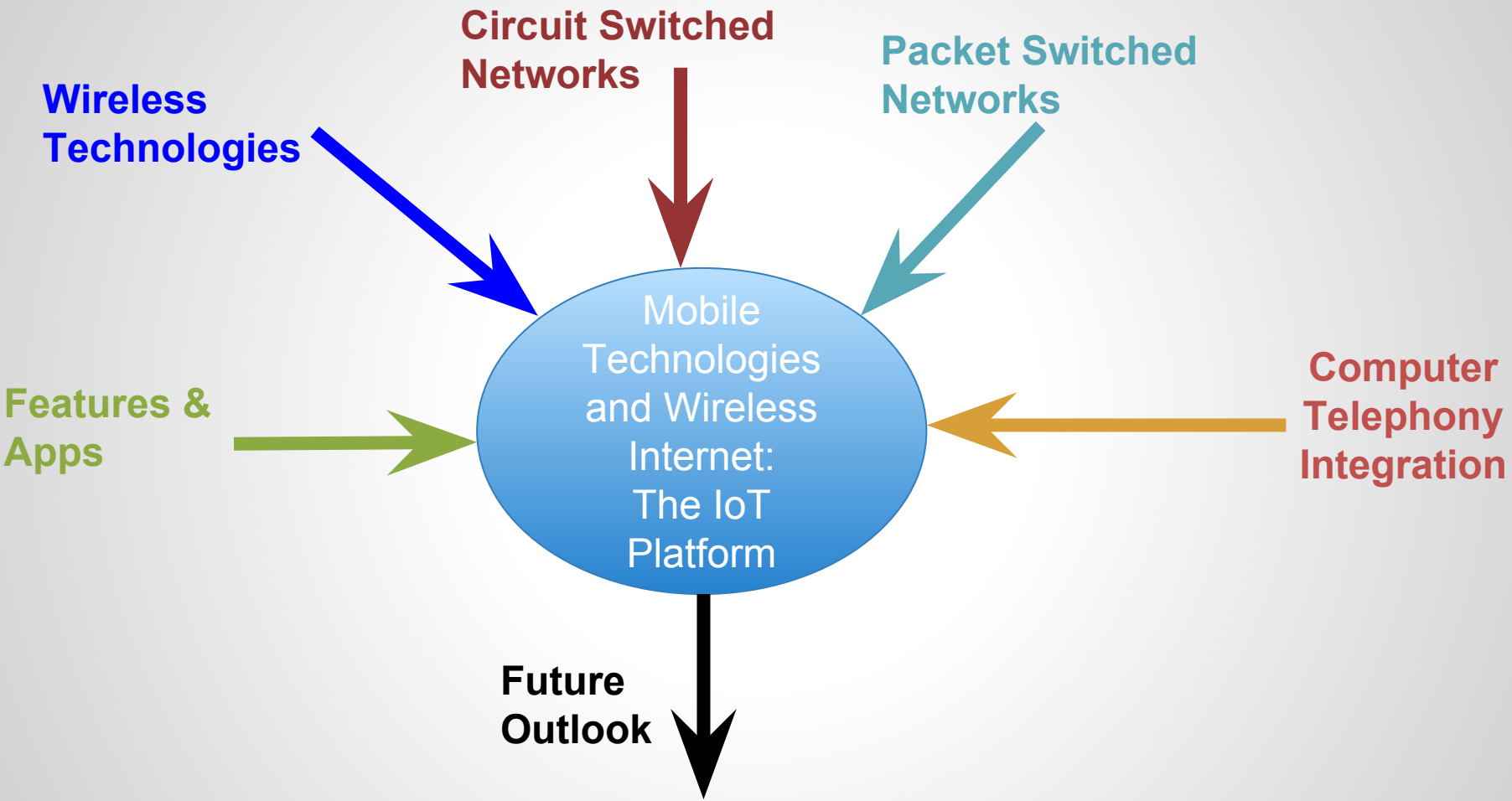
Internet of Things:

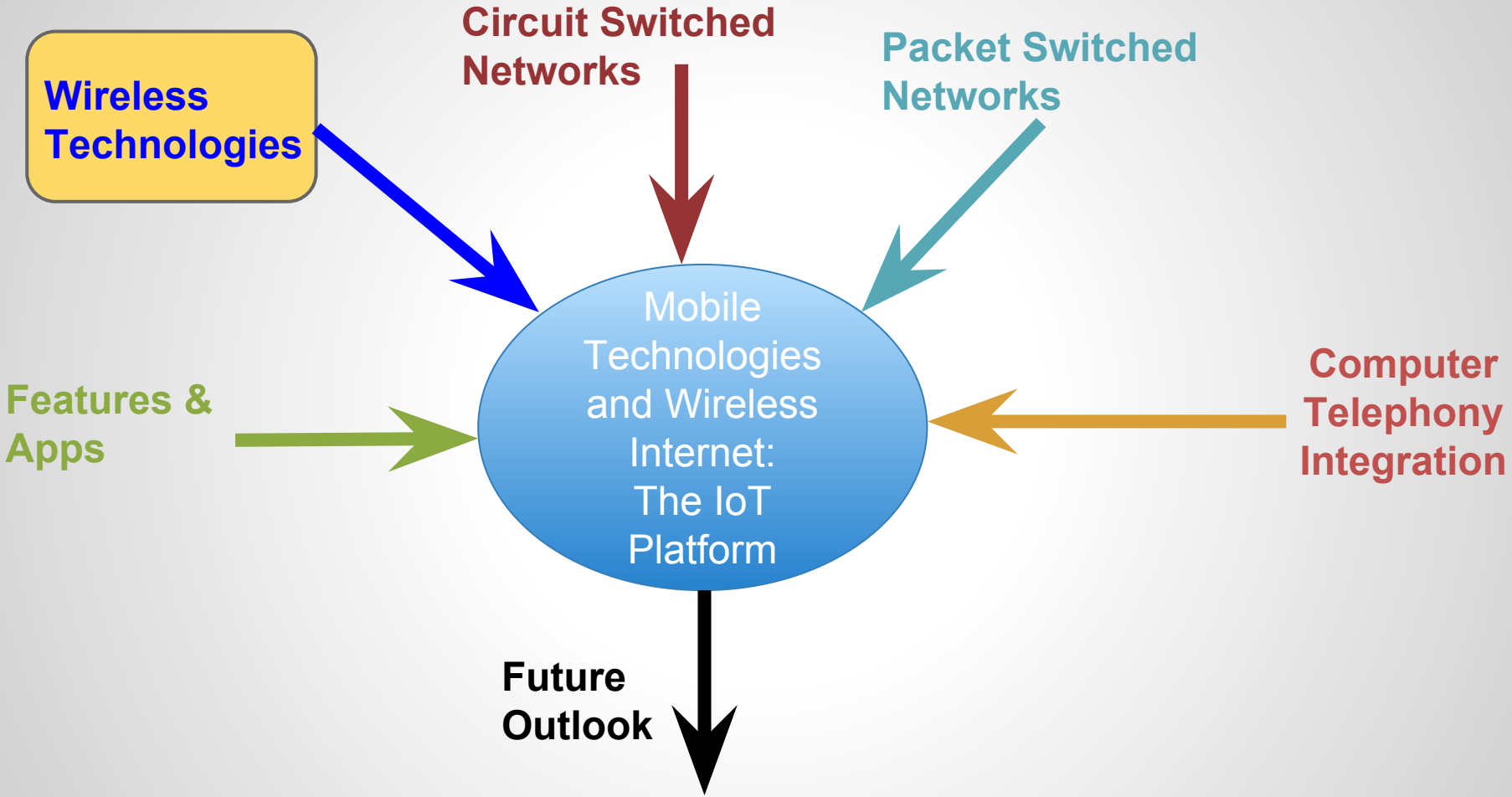
Wireless Technologies

Harinath Garudadri and Ganz Chockalingam

Qualcomm Institute of Calit2

University of California, San Diego


Circuit Switched Networks
Packet Switched Networks
Wireless Technologies
Mobile Technologies and Wireless Internet: The IoT Platform
Features & Apps
Computer Telephony Integration
Future Outlook


Wireless Technologies
Circuit Switched Networks
Packet Switched Networks
Features & Apps
Mobile Technologies and Wireless Internet: The IoT Platform
Computer Telephony Integration
Future Outlook

Lesson 1

Telephony goes Wireless

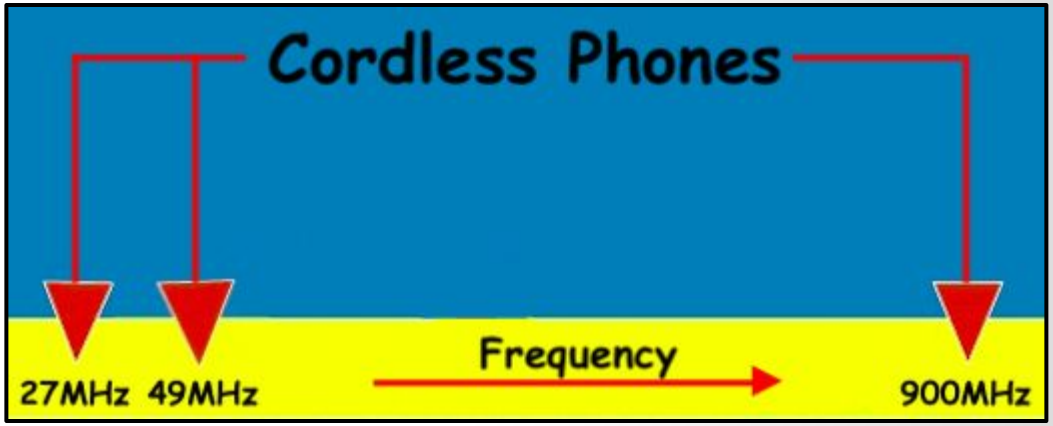
Lesson 1 | Telephony goes Wireless

1 - Why would someone want to walk around with a phone?

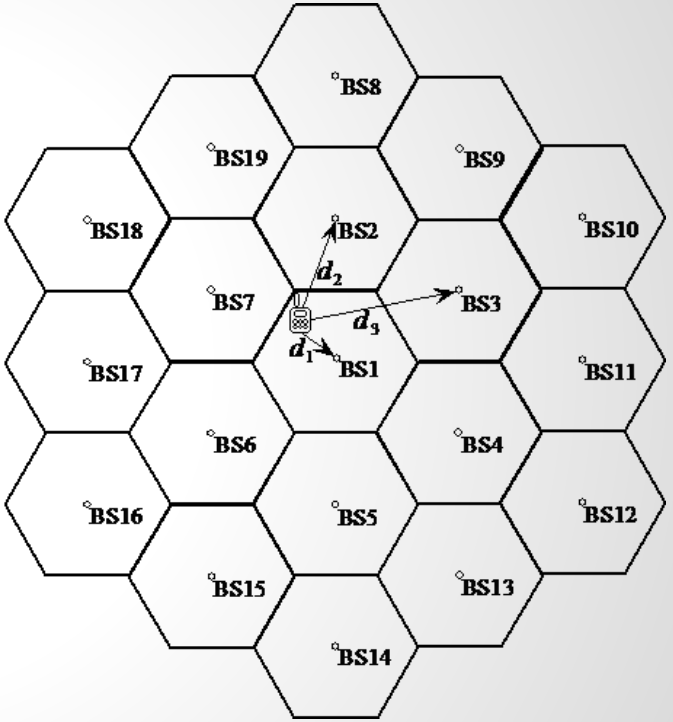
2 - AT&T almost missed the boat!

1 – Why would someone want to walk around with a phone?

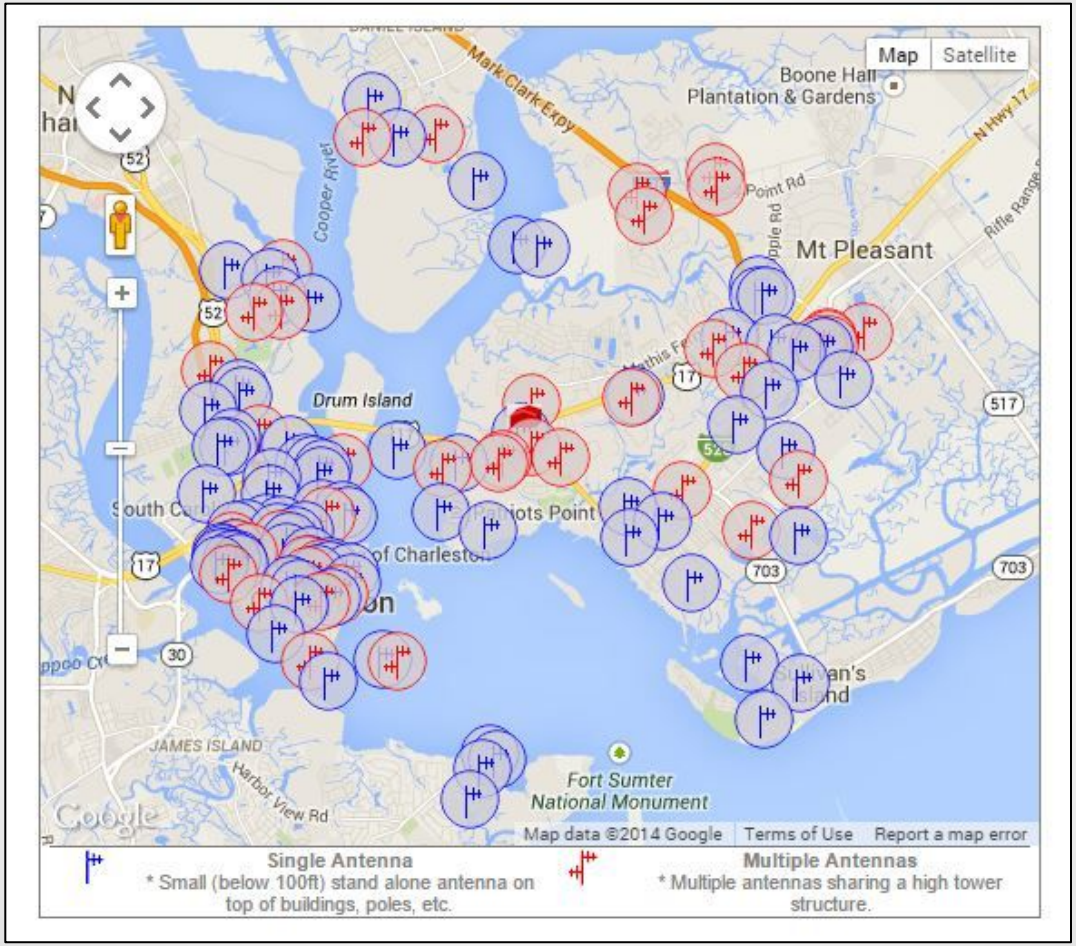
1 | Why would someone want to walk around with a phone?



1 | Why would someone want to walk around with a phone?



1 | Why would someone want to walk around with a phone?

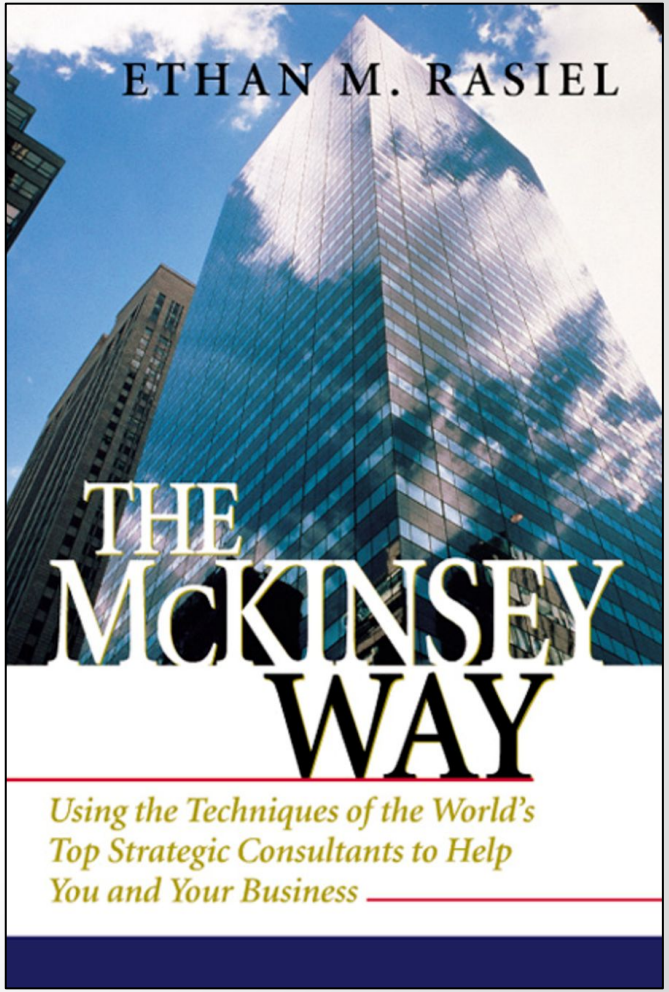


2 – AT&T almost missed the boat!

2 | AT&T almost missed the boat!

2 | AT&T almost missed the boat!

at&t



2 | AT&T almost missed the boat!*

Lesson 2

Mobility and the Control Plane

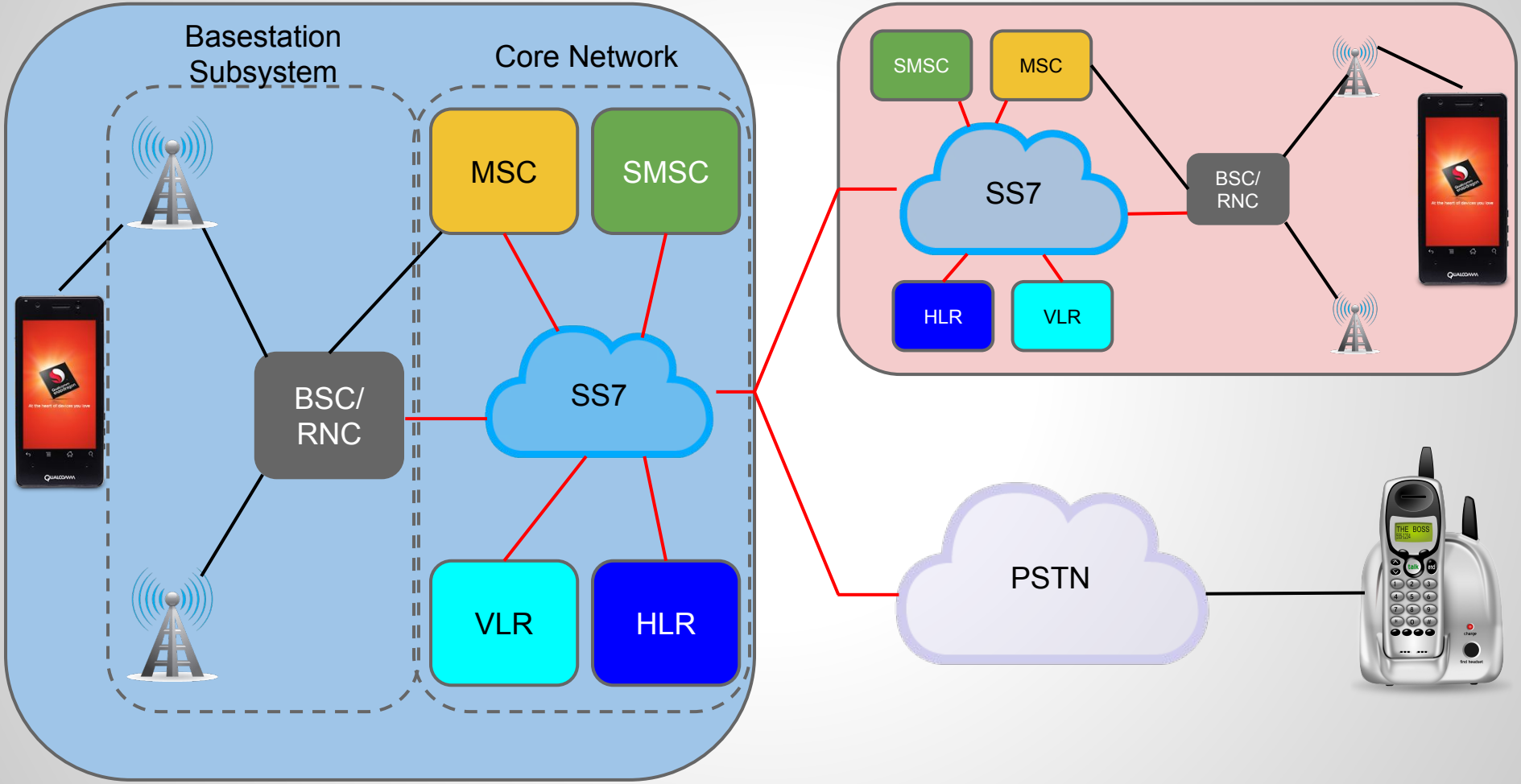
Lesson 2 | Mobility and the Control Plane

1 - Leveraging Telephony Infrastructure for Mobility

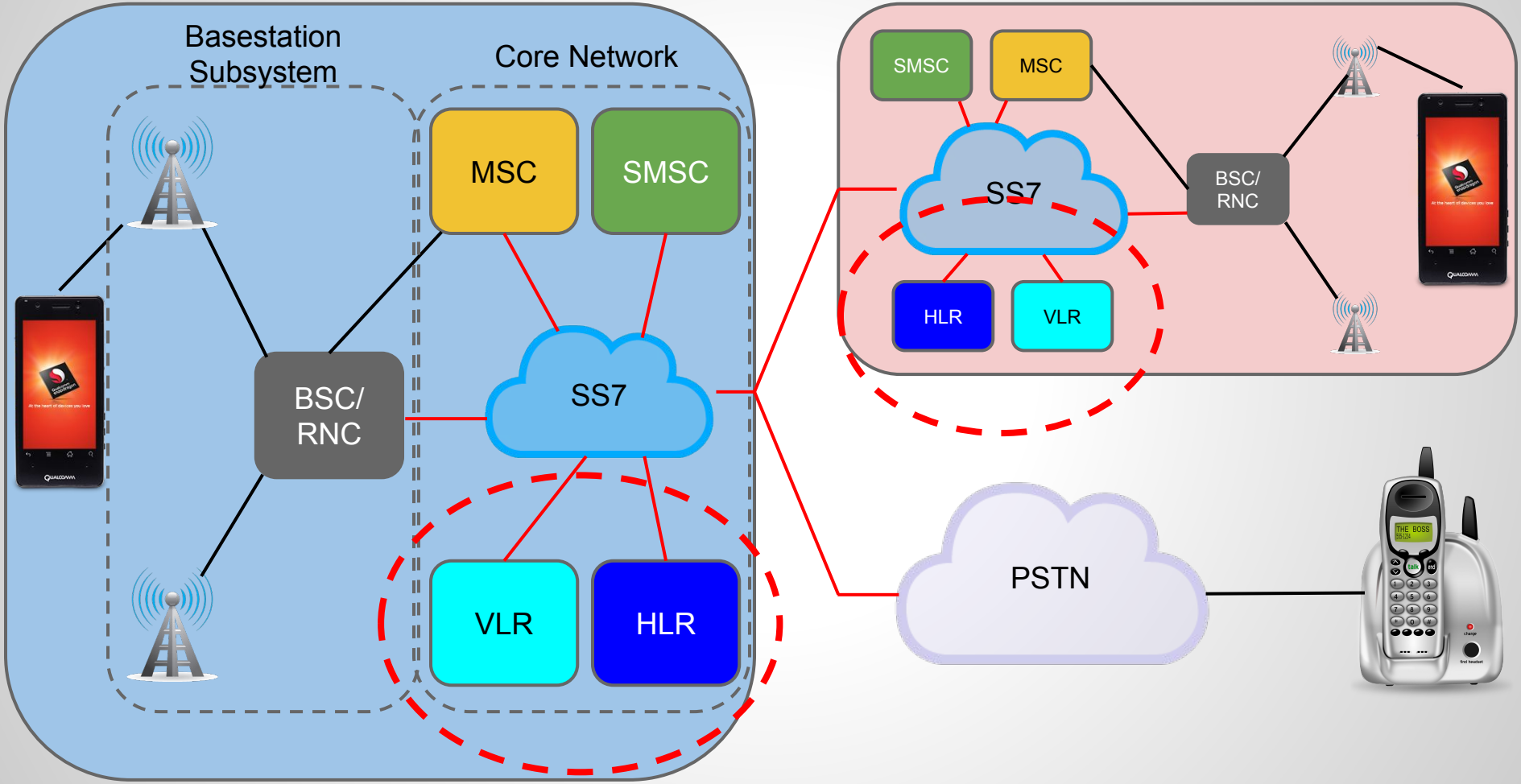
2 - Billing and Prepaid

1 – Leveraging Telephony Infrastructure for Mobility

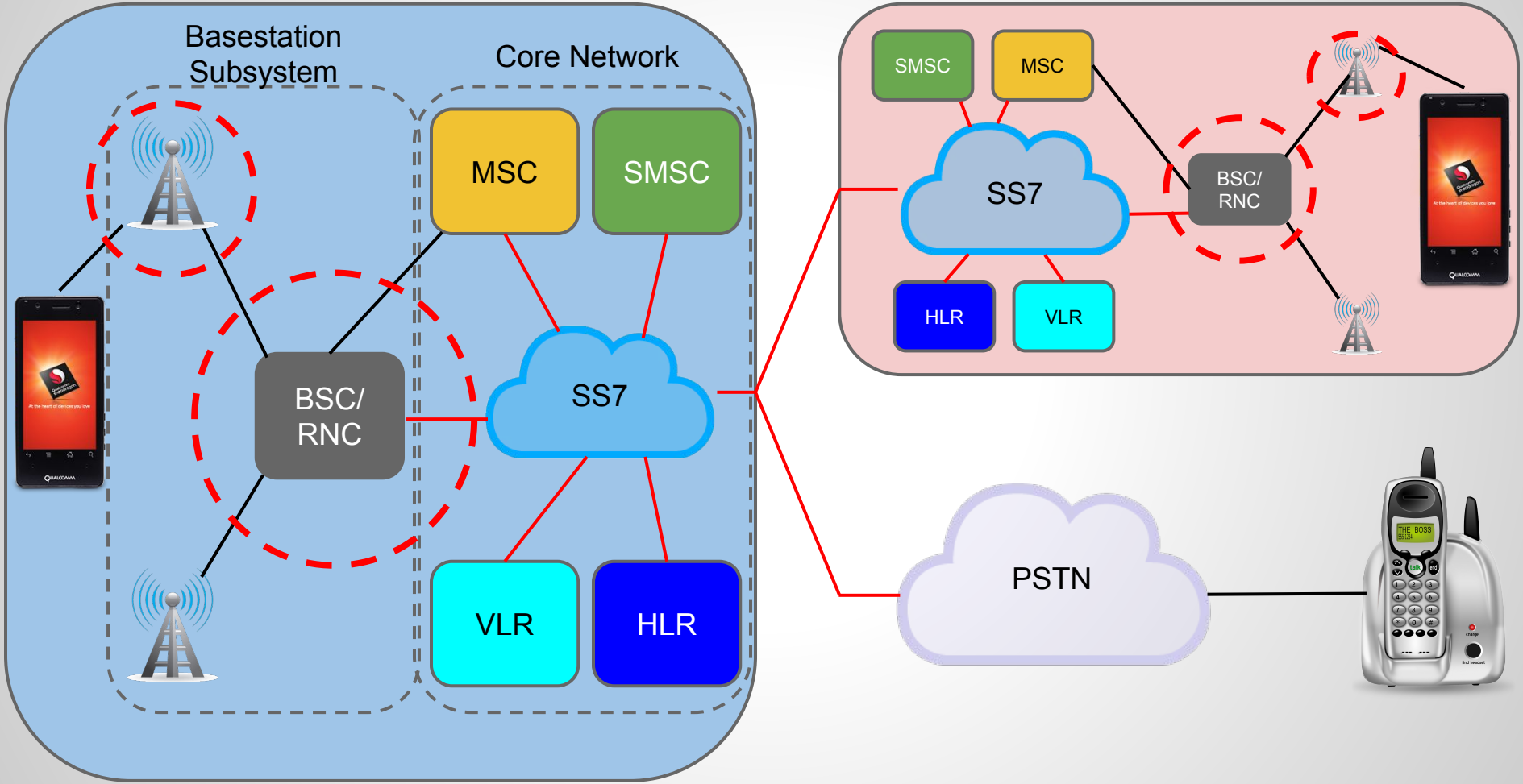
1 | Leveraging Telephony Infra for Mobility



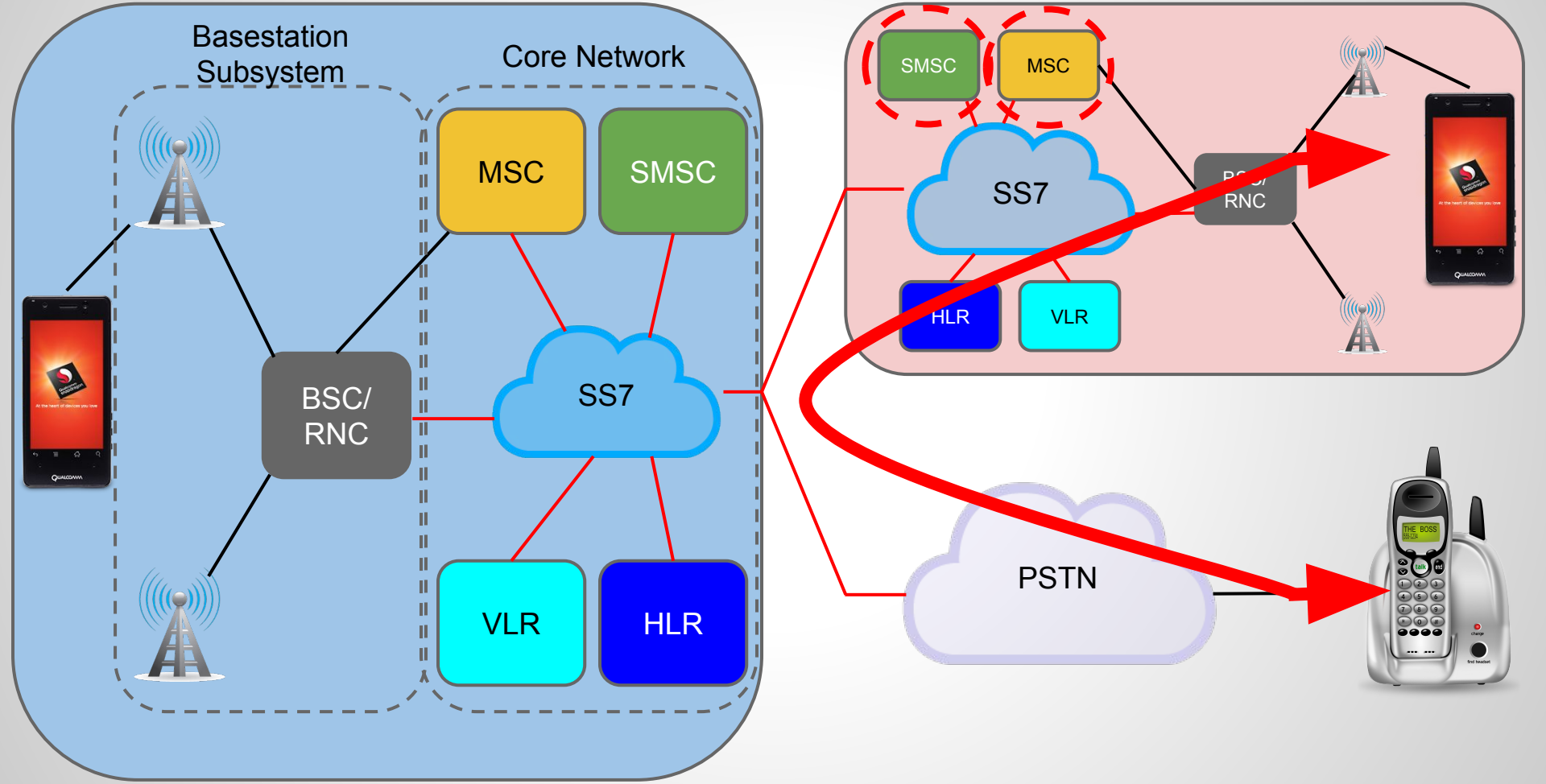
1 | Leveraging Telephony Infra for Mobility



1 | Leveraging Telephony Infra for Mobility



1 | Leveraging Telephony Infra for Mobility



2 – Billing and Prepaid

2 | Billing and Prepaid

ConsumerReports.org

Find Ratings

Cars | Appliances | Electronics | Home & Garden | Babies & Kids

Home > Electronics > How no-contract smart-phone plans stack up

Like Share 252 Tweet G+1 Pin it

How no-contract smart-phone plans stack up

Searching for a discounted, no-contract plan? Options abound

Last updated: July 02, 2014 09:45 AM

AT&T plans | Sprint plans | T-Mobile plans | TracFone Wireless plans | Verizon Wireless plans | Virgin Mobile plans (powered by Sprint)

Lesson 3

Air Interface (1G, 2G, 3G and 4G)

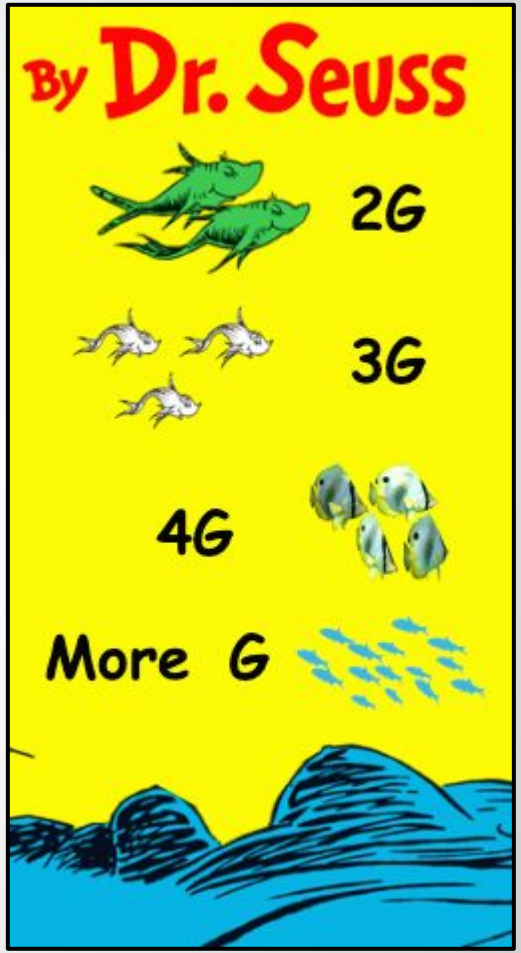
Lesson 3 | Air Interface (1G, 2G, 3G and 4G)

1 - Get more spectrum

2 - Improving Spectral Efficiency

3 - Reduce data rate for each voice call

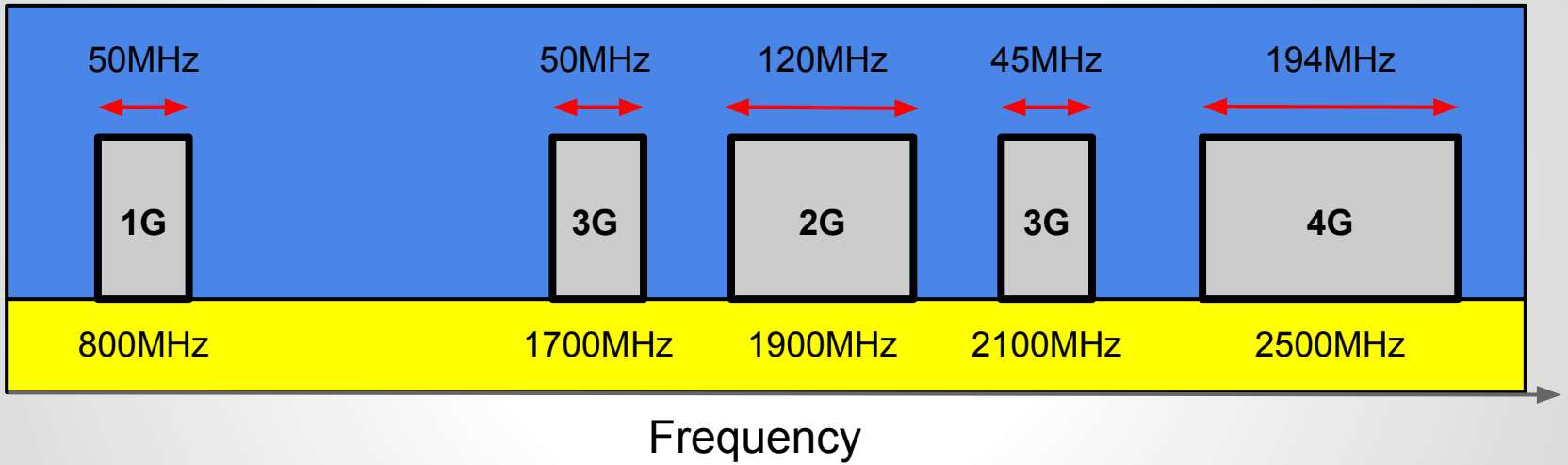
4 - 3G and 4G evolution



1 – Get more spectrum

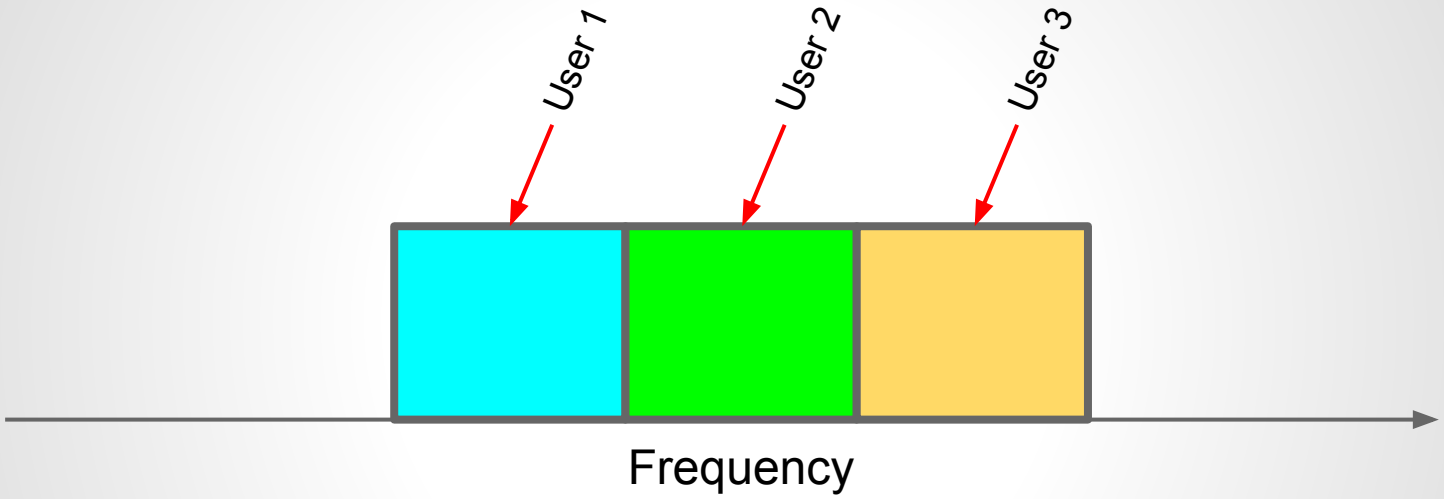
Do not show, Camera on Hari.

1 | Get more spectrum



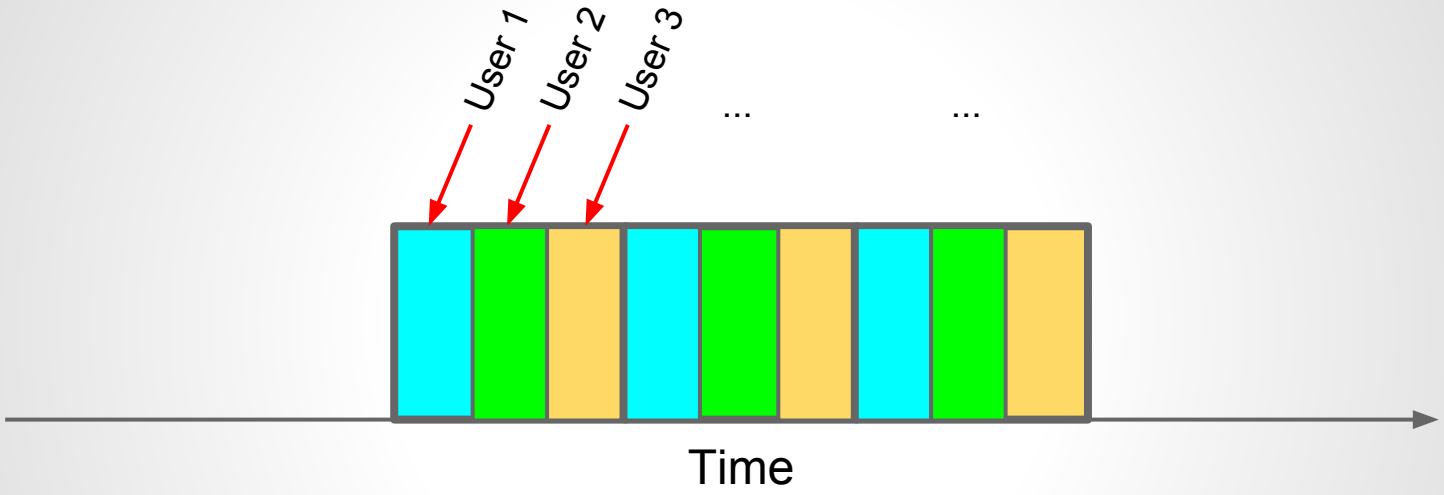
2 – Improving Spectral Efficiency

2 | Improving Spectral Efficiency



FDMA

2 | Improving Spectral Efficiency

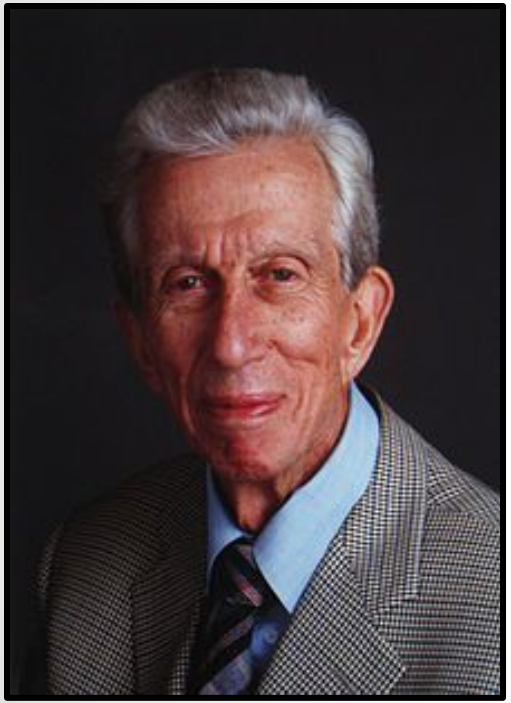


TDMA

3 – Reduce data rate for each voice call

3 | Reduce data rate for each voice call

Source-Filter Model of Speech

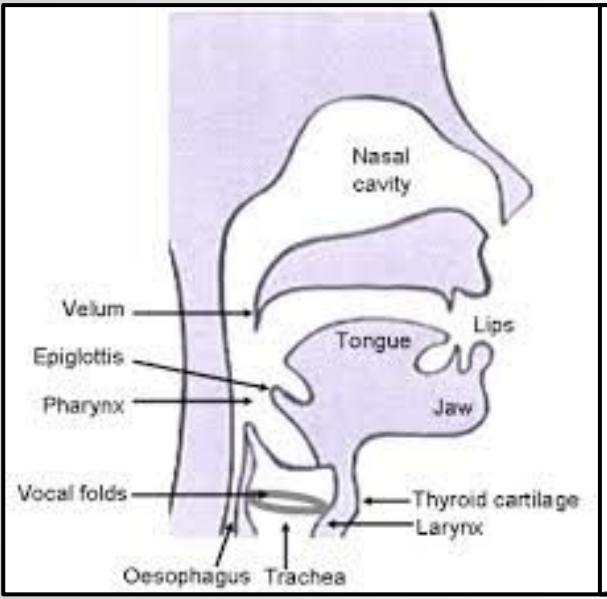


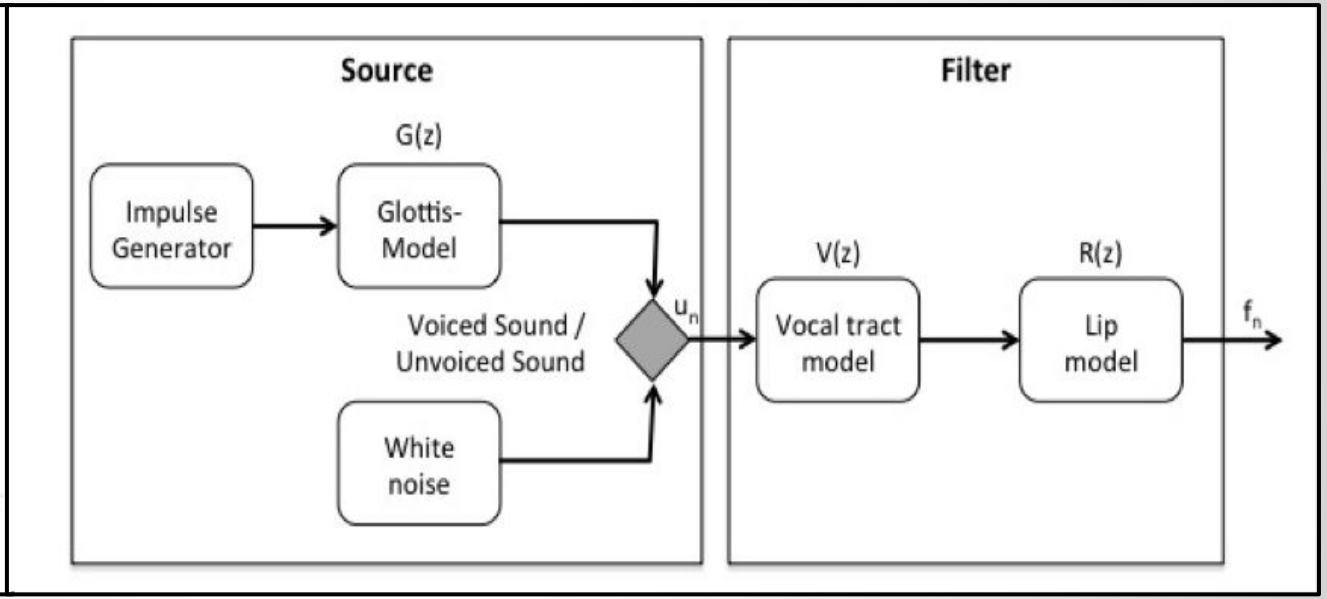
Gunnar Fant
KTH, Sweden

Linear Predictive Coding (LPC)

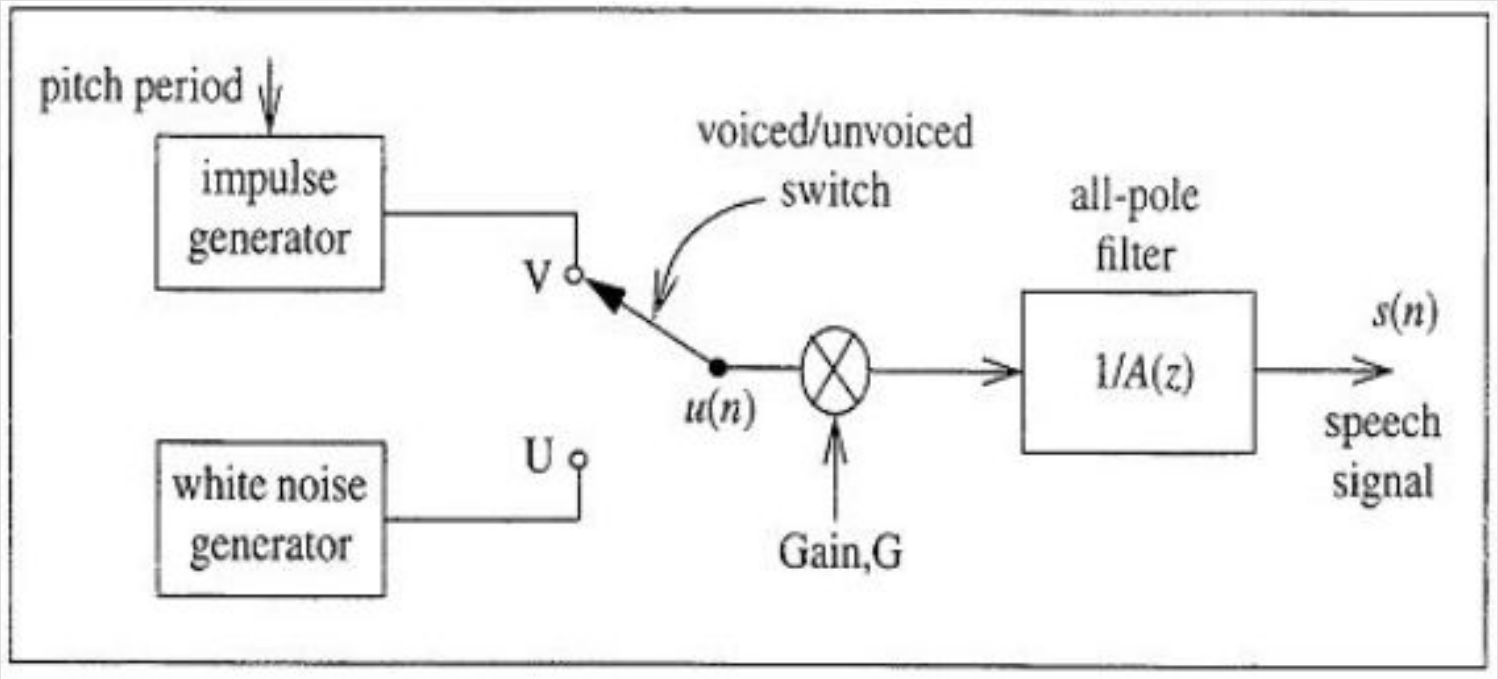
Bishnu Atal
AT&T

3 | Reduce data rate for each voice call



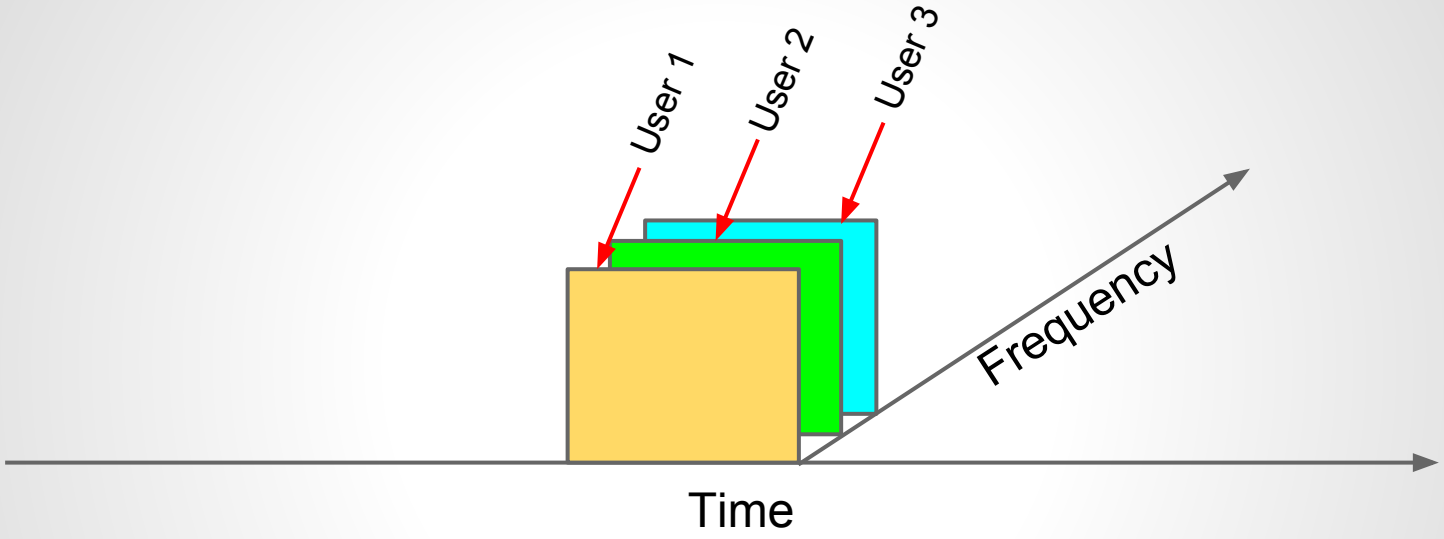


3 | Reduce data rate for each voice call



0.5 to 1.5 bits / sample instead of 8 bits / sample

3 | Reduce data rate for each voice call



CDMA

4 – 3G and 4G evolution

Intentionally Left Blank

4 | 3G and 4G evolution

THE WALL STREET JOURNAL.

LEADER

Qualcomm CEO's Innovation Has Telecom Giants on Edge

By
QUENTIN HARDY Staff Reporter of The Wall Street Journal
Updated Sept. 6, 1996 12:01 a.m. ET

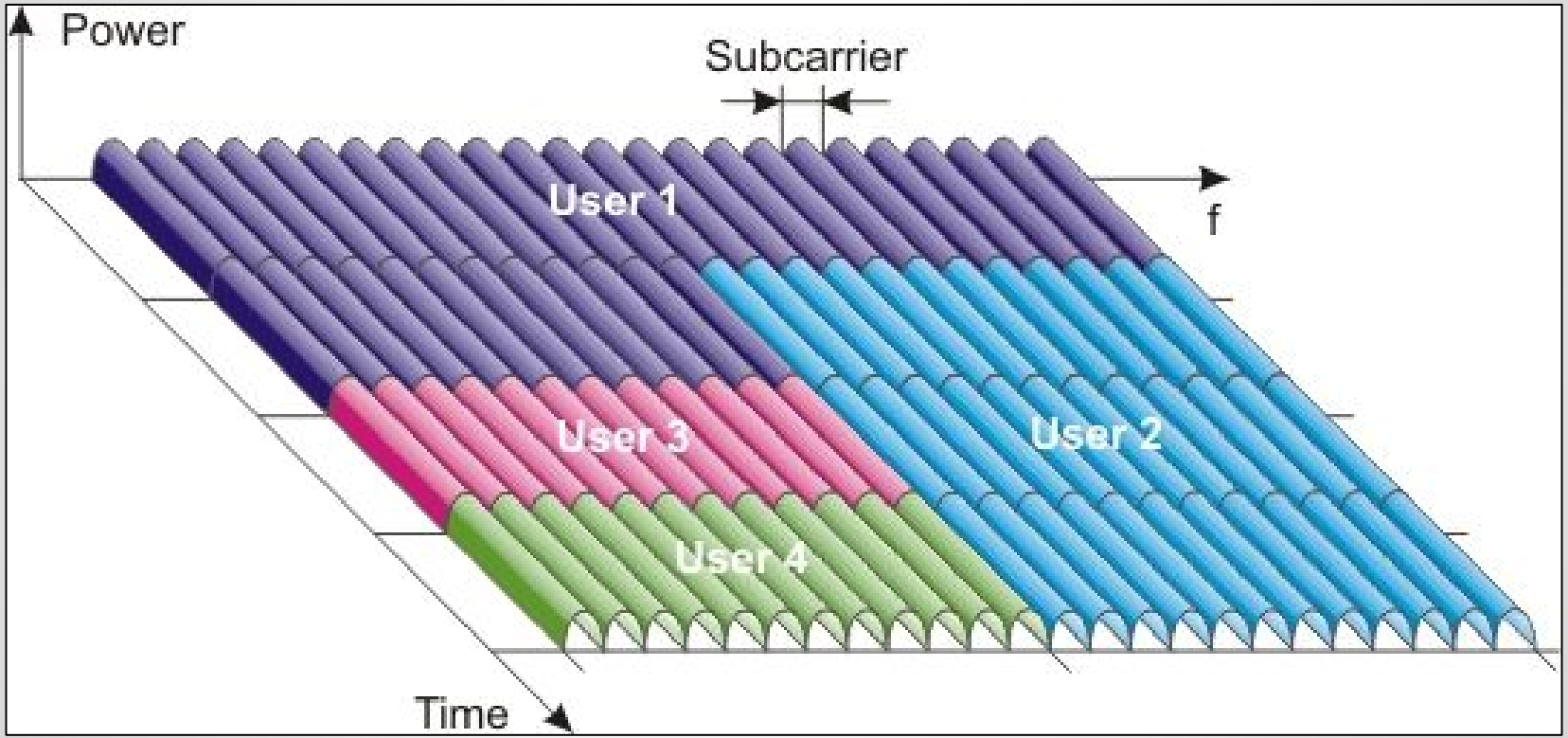
A multibillion-dollar technology gamble taken by some of the biggest names in telecommunications never would have happened without a tireless champion named Irwin Jacobs.

The question is whether he should be celebrated -- or blamed.

4 | 3G and 4G evolution


4G
LTE

4 | 3G and 4G evolution



Lesson 4

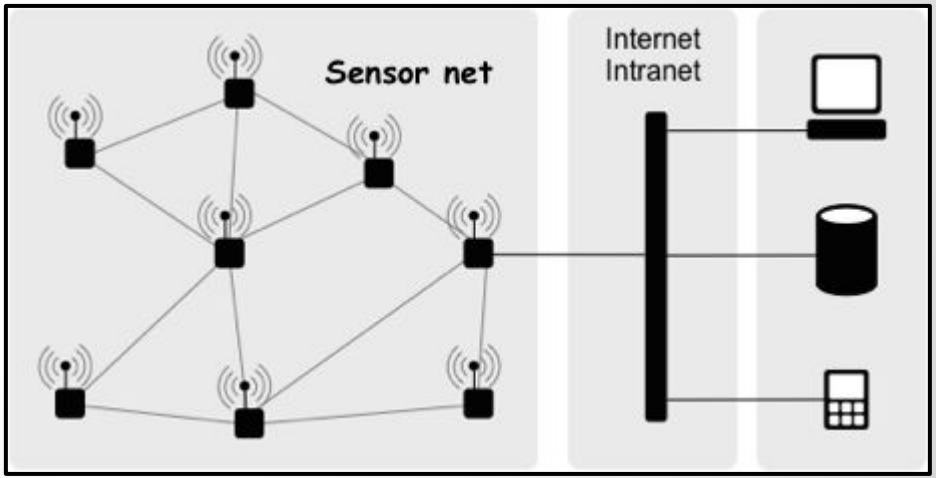
Radios, Radios and Radios

Lesson 4 | Radios, Radios and Radios

1 - WiFi

1 - Bluetooth

2 - Other low power Radios



1 – WiFi

1 | WiFi

2 – Bluetooth

2 | Bluetooth

3 – Other low power radios

3 | Other low power radios

ANT

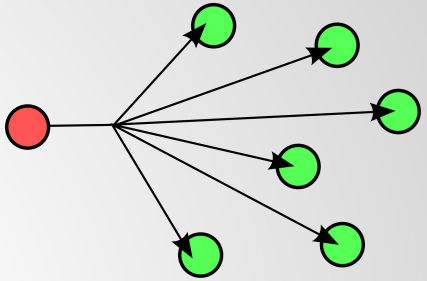
RFID

Lesson 5

Networks Revisited

Lesson 5 | Networks Revisited

1 - Telephony 1-to-1



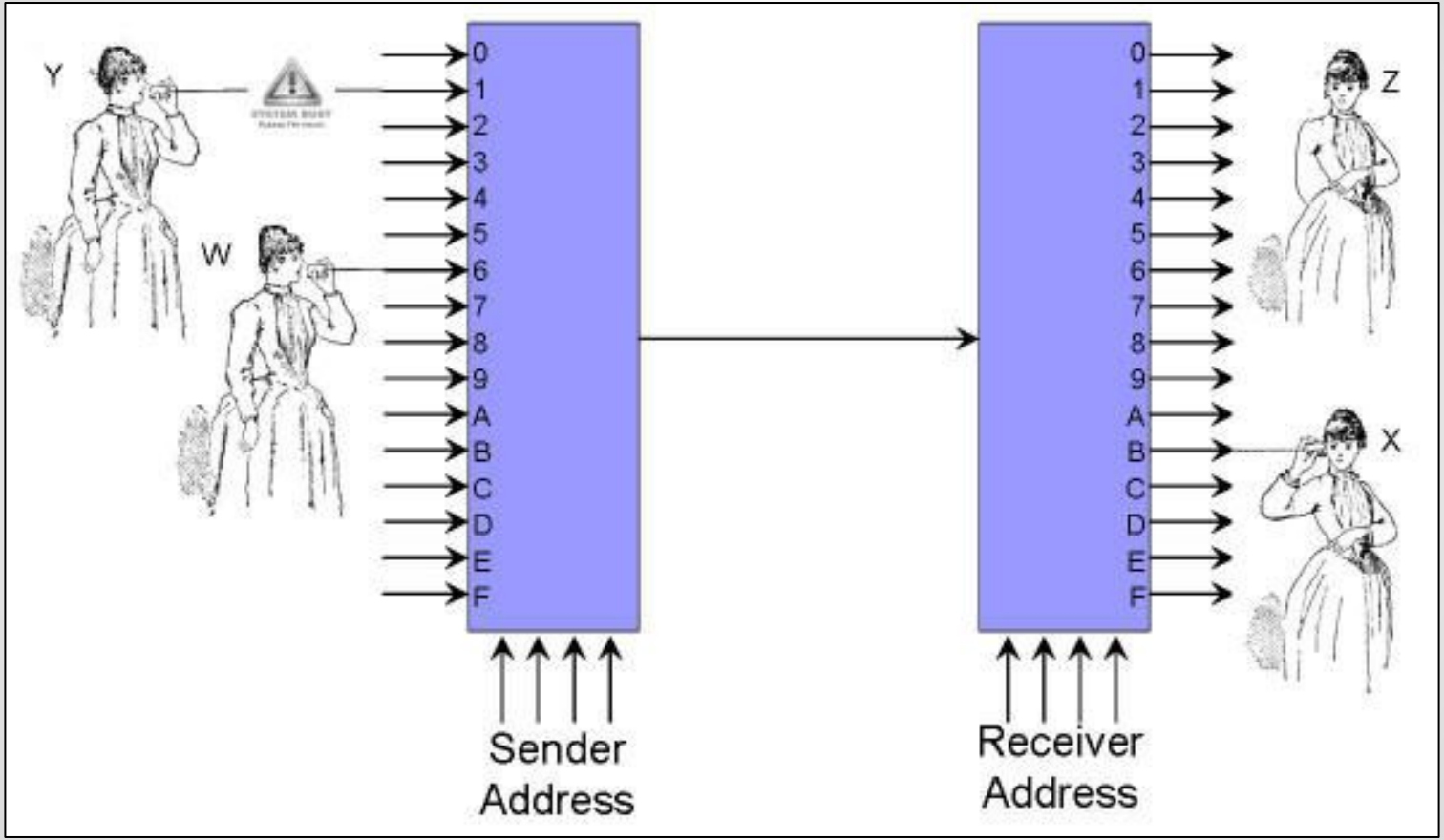
2 - Broadcast 1-to-N

3 - Sensor Network N-to-1

4 - A Platform for IoT

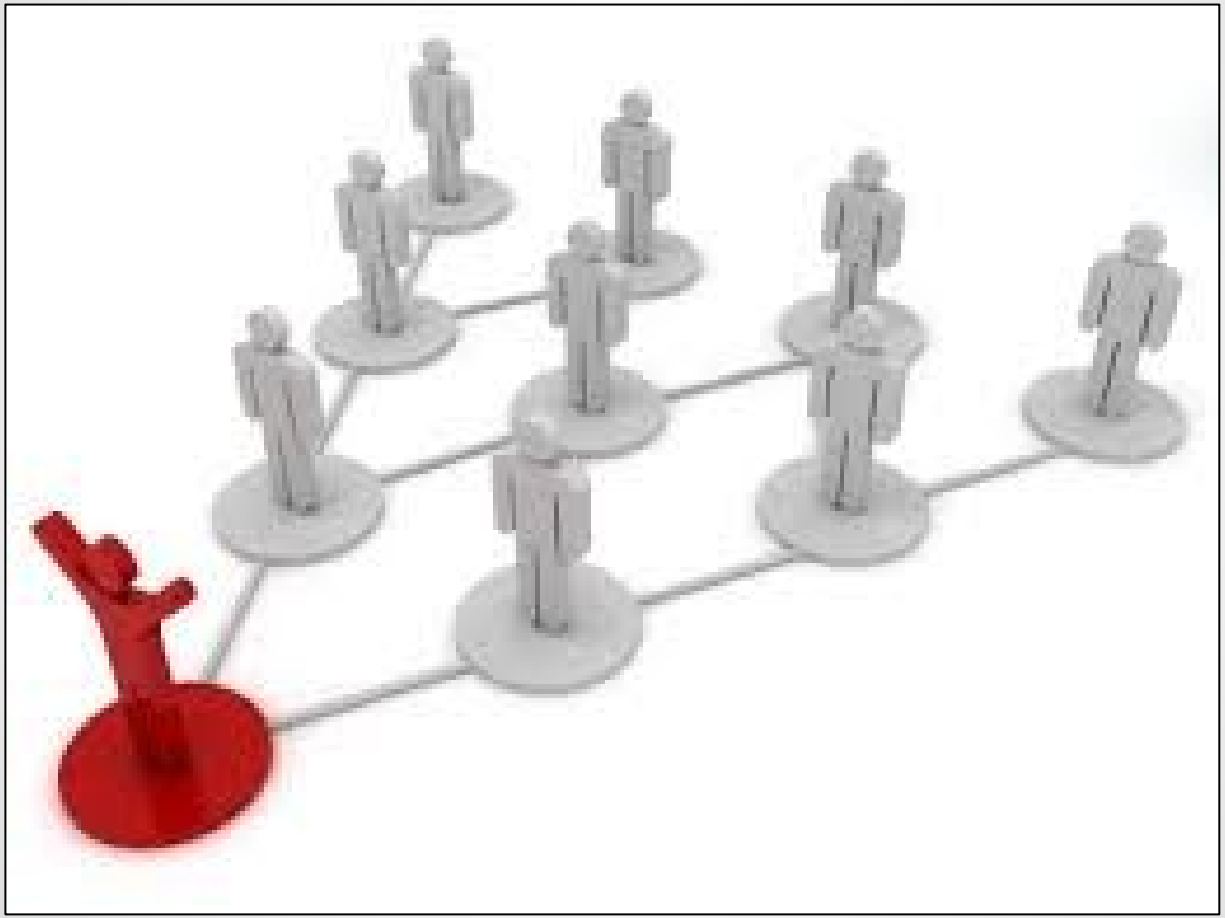
1 - Telephony 1-to-1

1 | Telephony 1-to-1



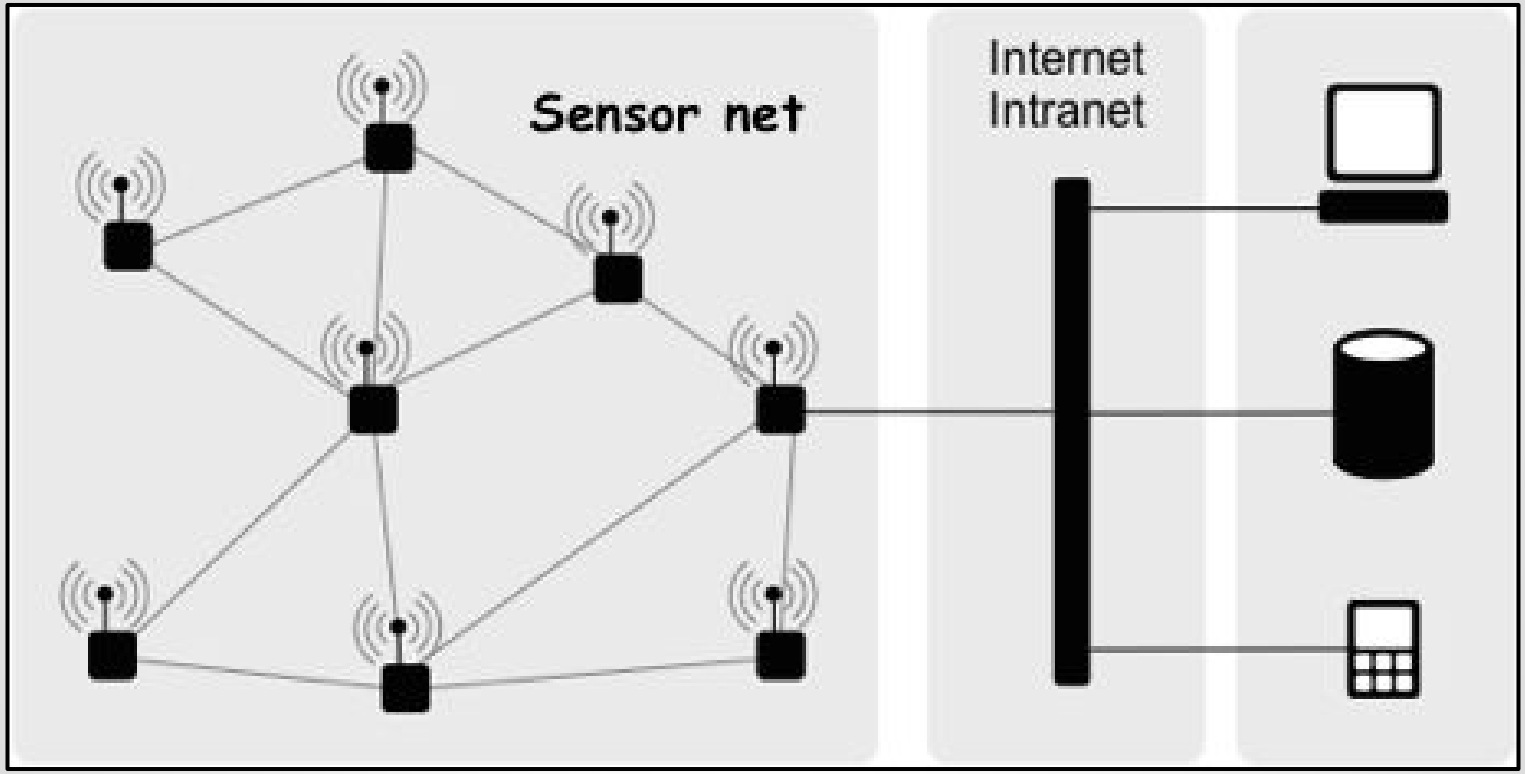
2 - Broadcast 1-to-N

2 | Broadcast 1-to-N



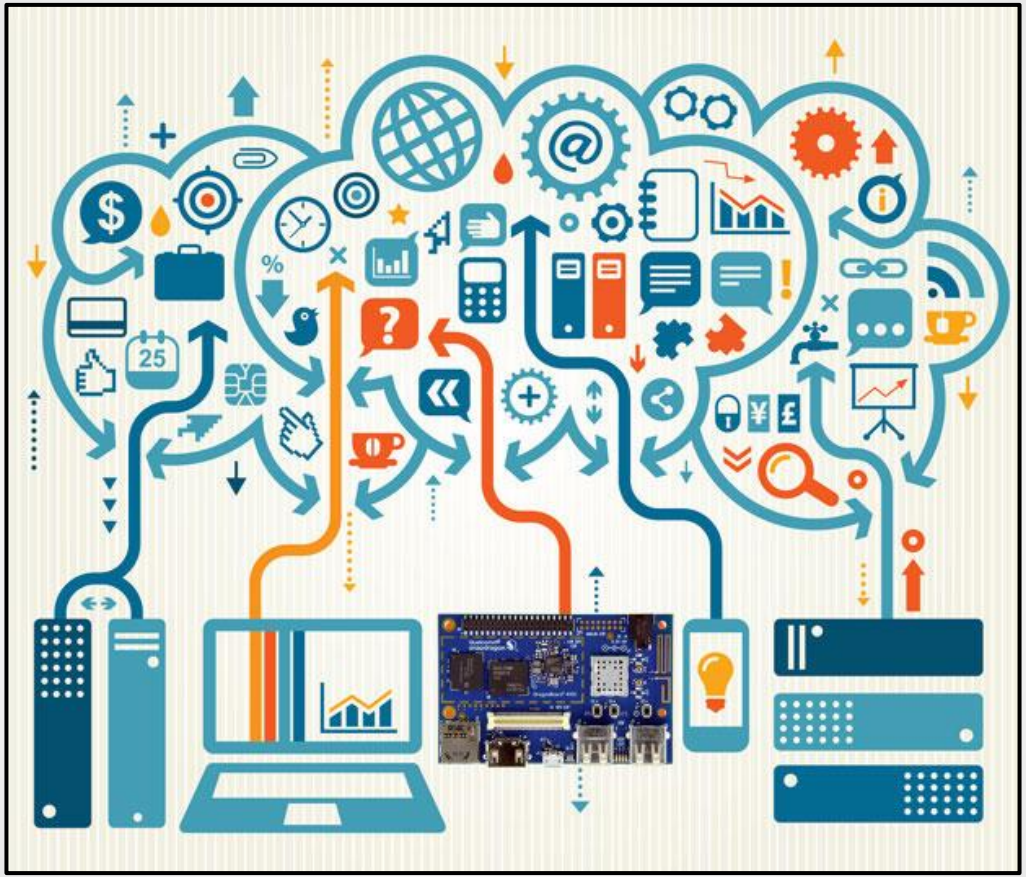
3 - Sensor Networks N-to-1

3 | Sensor Networks N-to-1



4 - A platform for IoT

4 | A platform for IoT



4 | A platform for IoT