

Long Term Evolution

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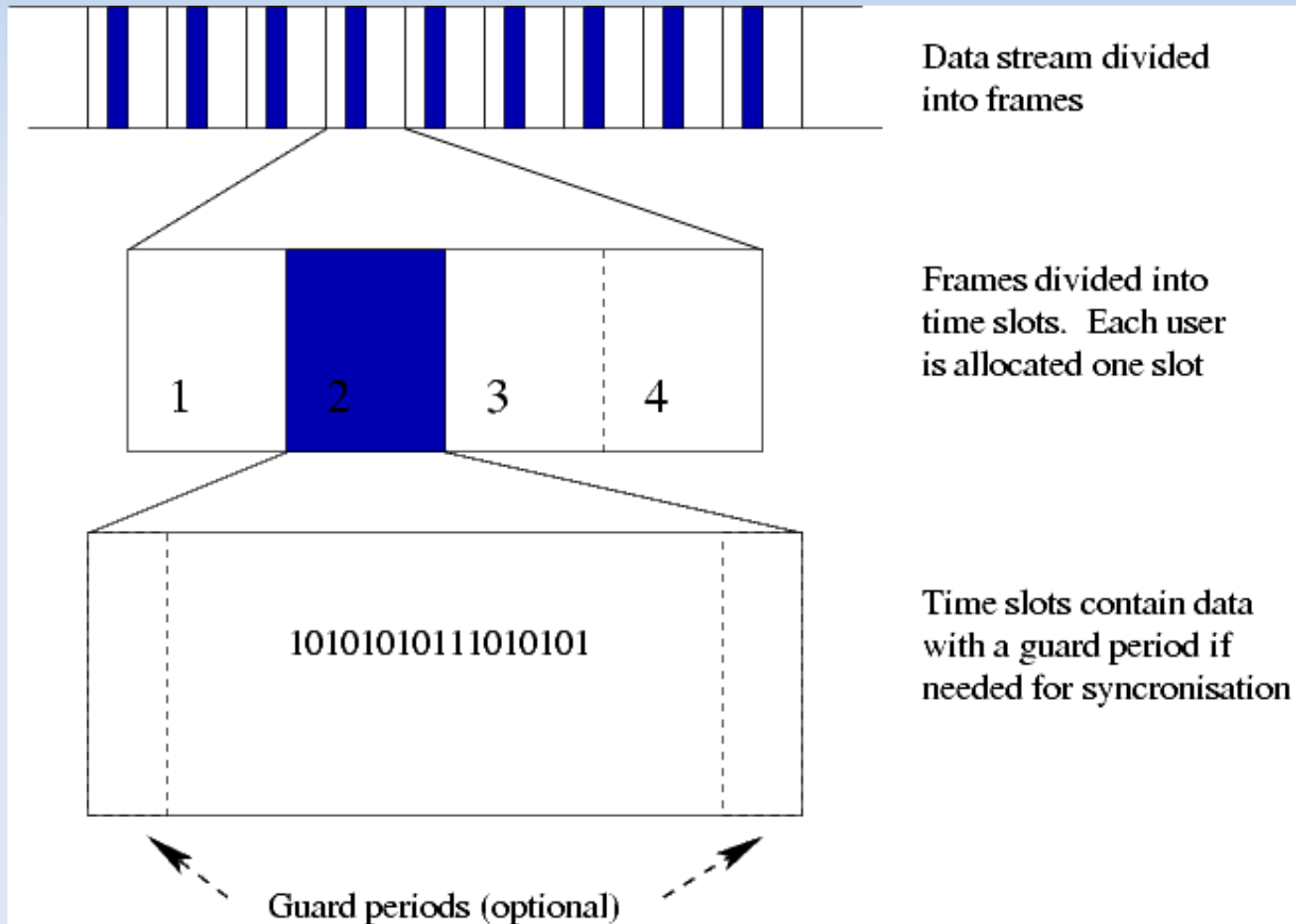


Introduction

- Multi-User
- Local Coverage
- Geolocalisation
- National Coverage

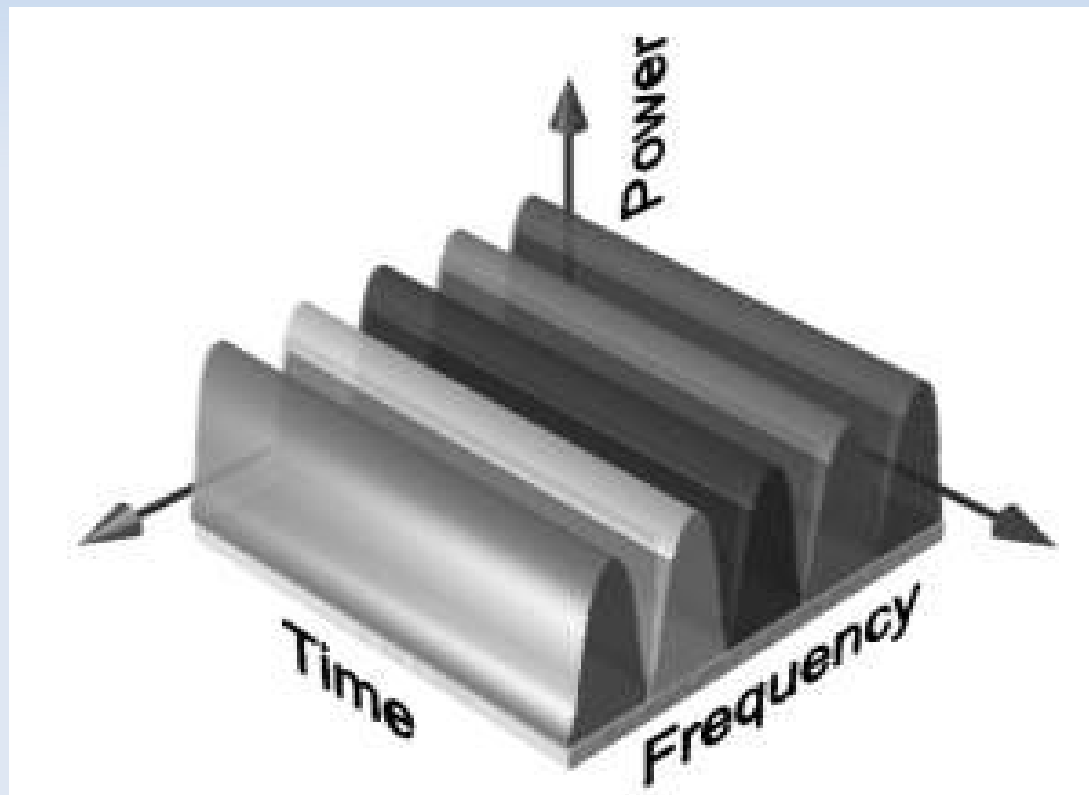
Multi-User

- TDMA (Time Division Multiple Access) :



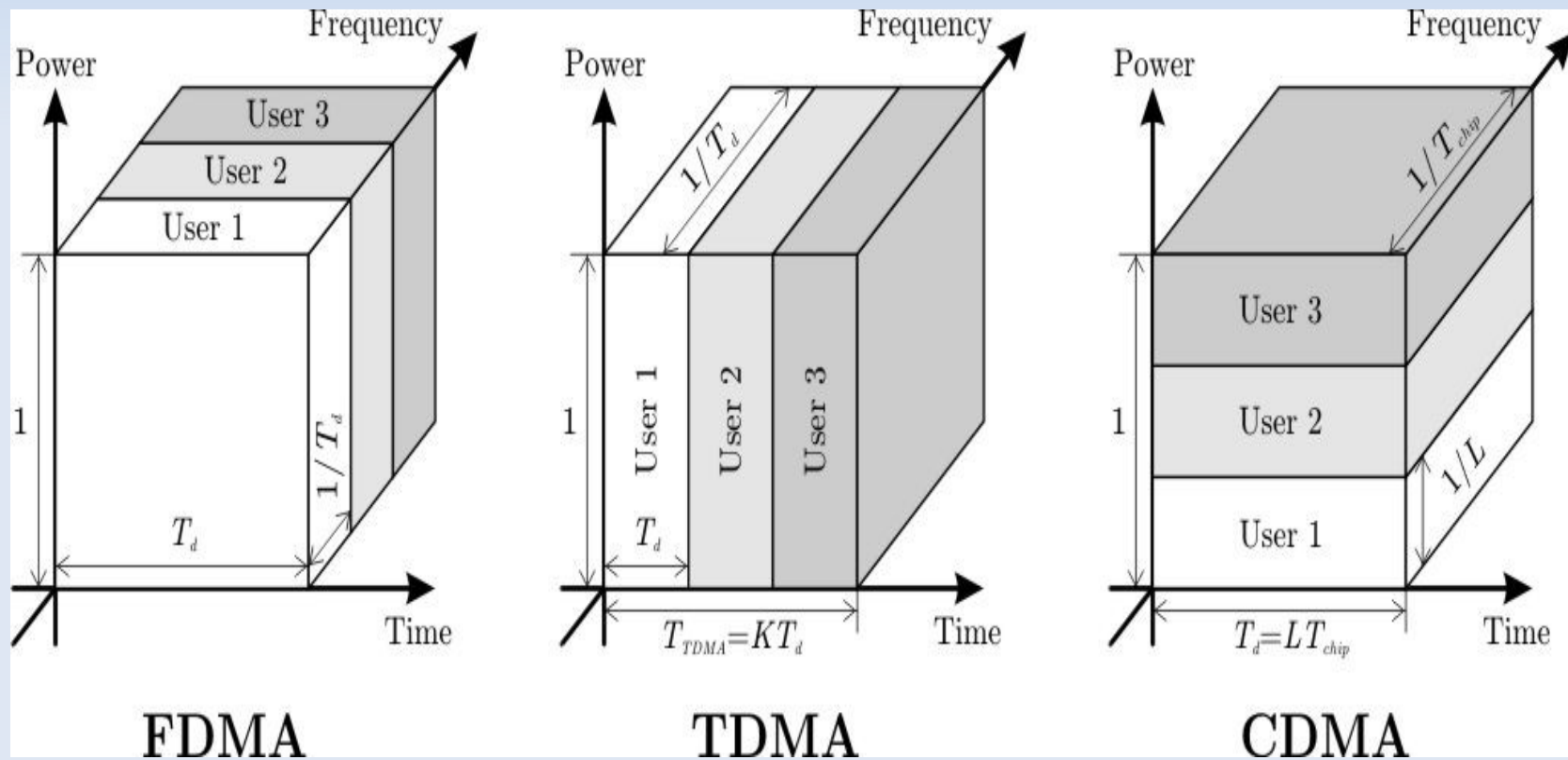
Multi-User

- FDMA (Frequency Division Multiple Access) :



Multi-User

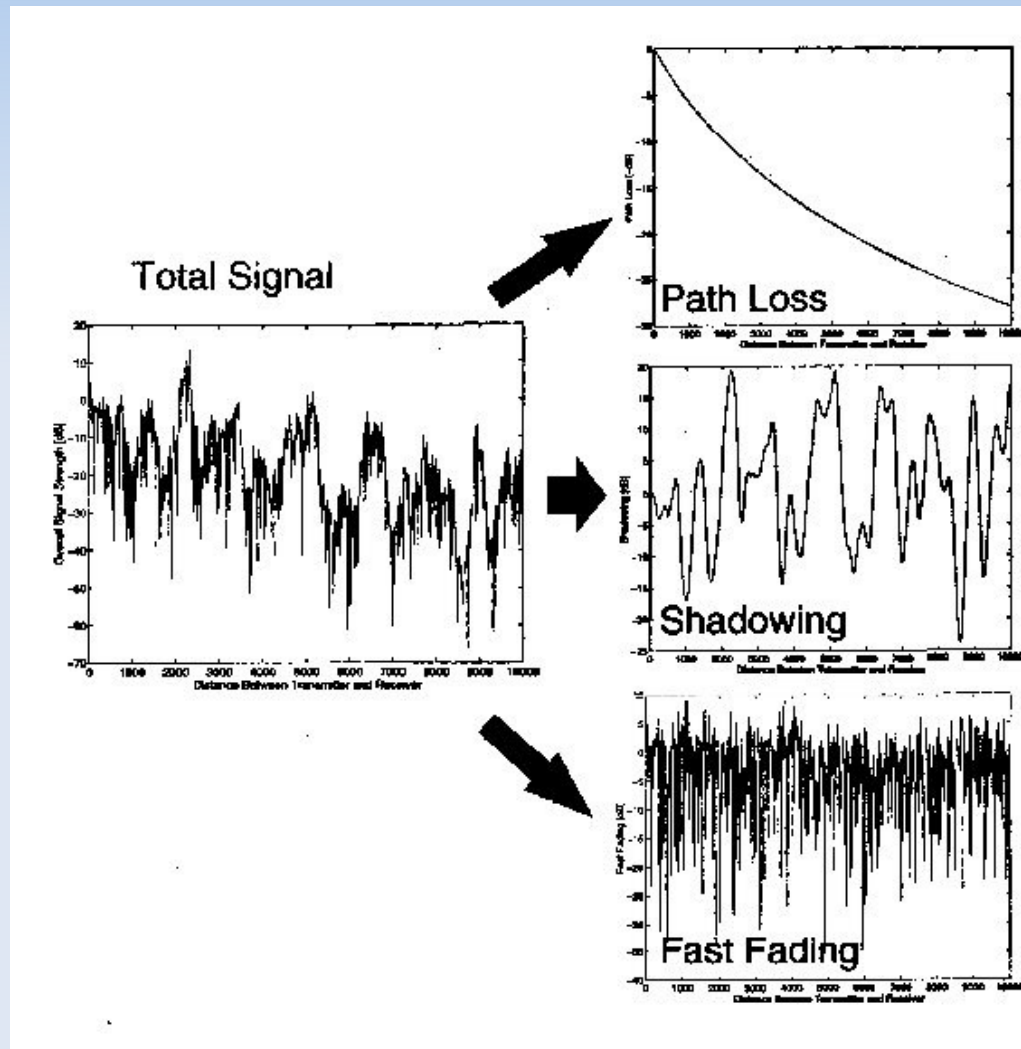
- CDMA (Code Division Multiple Access) :



Local Coverage

- Path Loss
- Shadowing
- Antenna

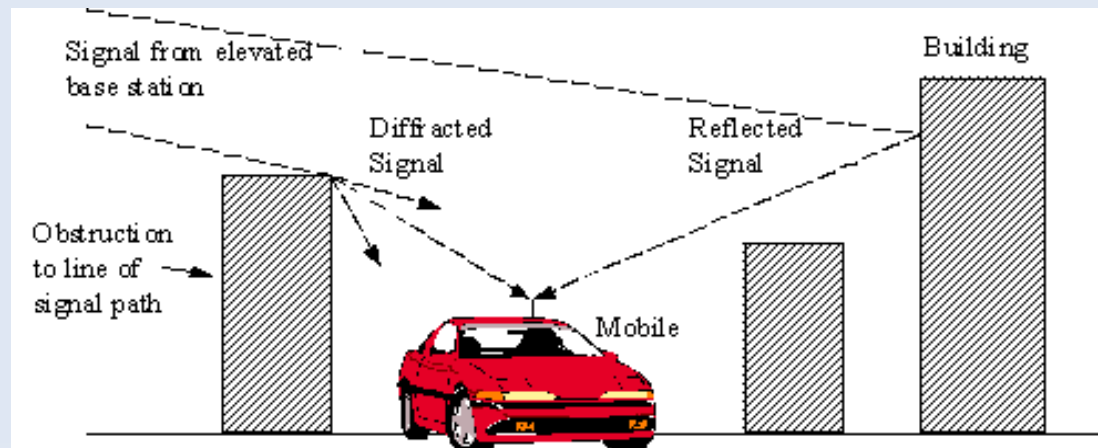
Local Coverage



Path Loss

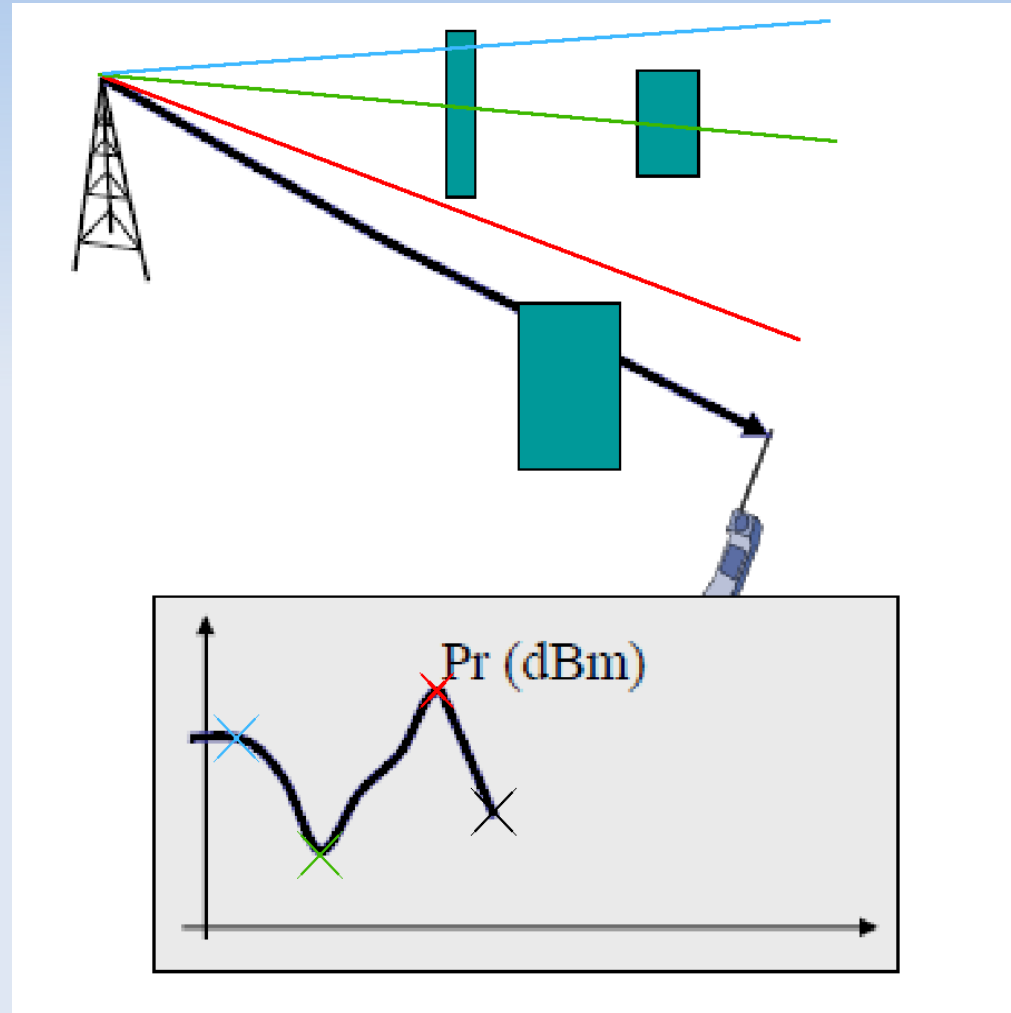
- reduction in power density (attenuation) of an electromagnetic wave as it propagates through space
- A lot of pattern (depends on environment)
- Ideal pattern : Free space (« Line Of Sight »)
 P_r on $1/d^2$

- Complexity



Shadowing

- Variation due to obstacles
- Random phenomena



Antenna

- Sensitivity
- Loss
- Problem mobile power / antenna power :
mobile should be able to contact the base station

Antenna

- Input :
 - Trafic
 - Capacity
 - Surface to cover
- Ouput :
 - Number of Cell
 - Place

Some number

- 20 000 sites to cover the whole France
- 500 for Toulouse
- 13 for Roland Garros

Geolocalisation

SM : Station Mobile

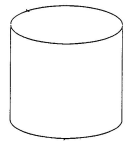
BTS : Base Station System

BSC : Base Station Controller

MSC : Mobile-service Switching Center

HLR : Home Location Register

VLR : Visitor Location Register



Data Base



Switch



Antenna

