D2D in NS-3

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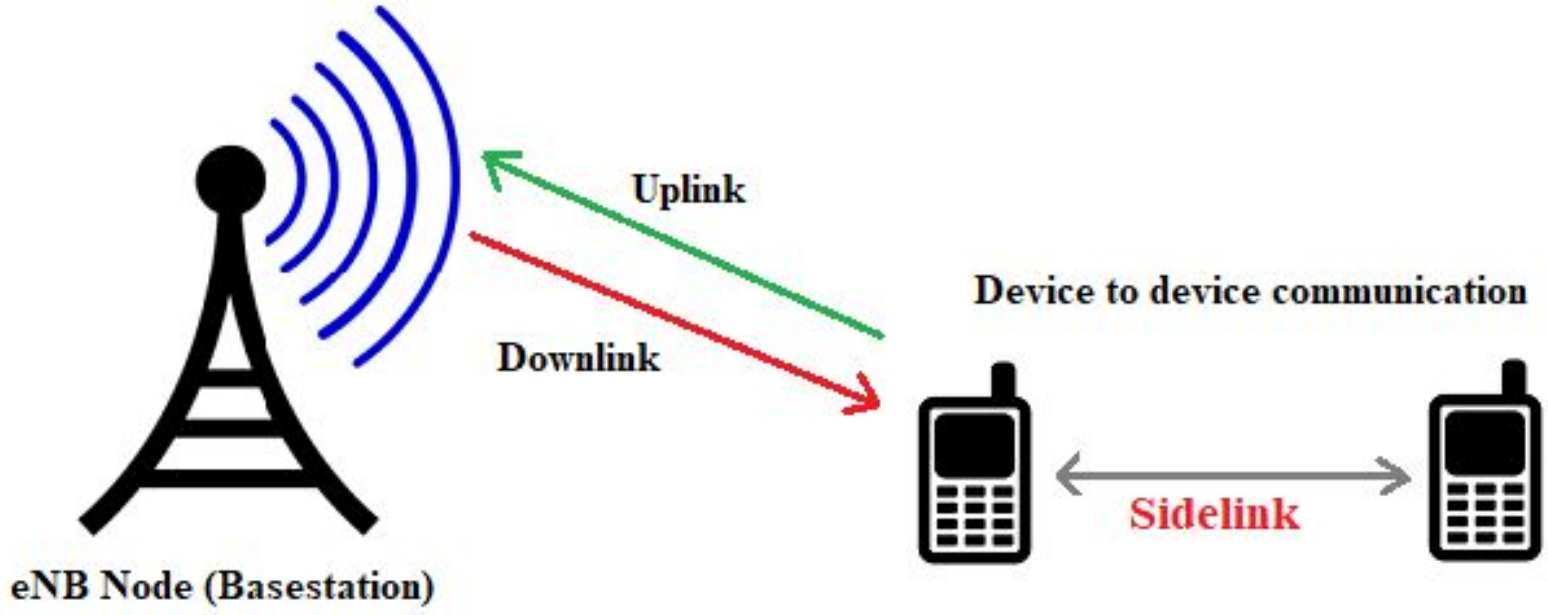
Previous Session

- Pillars of 5G
- D2D Communication, *Prose*
  - In coverage , partial coverage and out of coverage
- Why D2D ?
- Spectrum Allocation
  - Inband
  - Outband



Sidelink Visualization

Image Source :https://www.everythingrf.com/community/what-is-lte-sidelink

D2D in NS3

- Go to NS3 App store
- Search for “Public Safety Communications” or D2D Communication
- Download
- You can copy the required files in to the NS3 folder
- Or, you can install it as a separate repository.

For installing it as a separate repository

Go to folder *psc-ns3-3.0.1* and follow the steps.

Step 1: *./waf --build-profile=debug --enable-examples --enable-test configure*

Step 2: *./waf*

Check whether installation is proper or what

execute the scratchsimulator.cc

./waf --run scratch/scratchsimulator

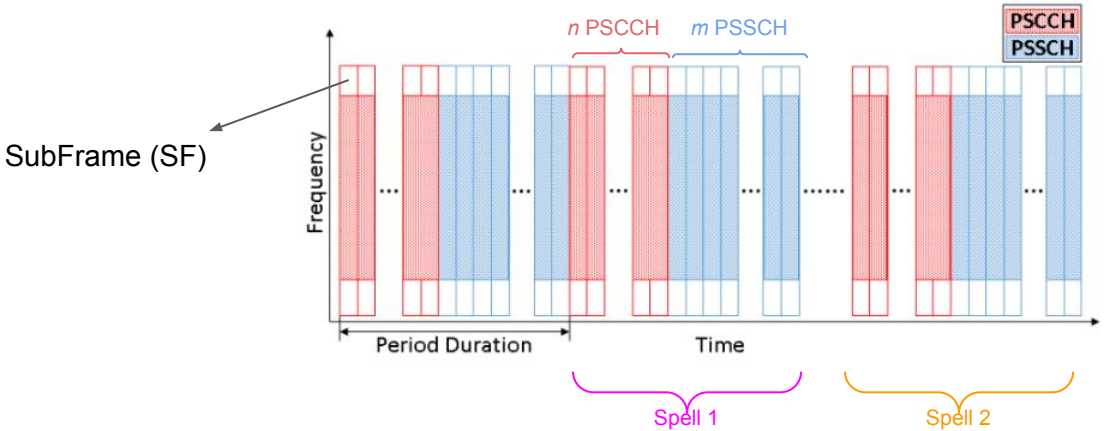
Two Modes of D2D Communication

- Mode 1
  - In coverage , eNB assisted
- Mode 2
  - Out of Coverage , eNB will not be in picture.

Ex 1:

Spell 1: Time duration 10 am to 10:10 am
Each SubFrame duration is 1 min.
10 SFs
3 SFs PSCCH and 7 SFs - PSSCH

Physical SL Control Channel (PSCCH)
Physical SL Shared Channel (PSSCH)



PSSCH : Time Resource Pattern (TRP)

Which SFs are used for transmission by UE

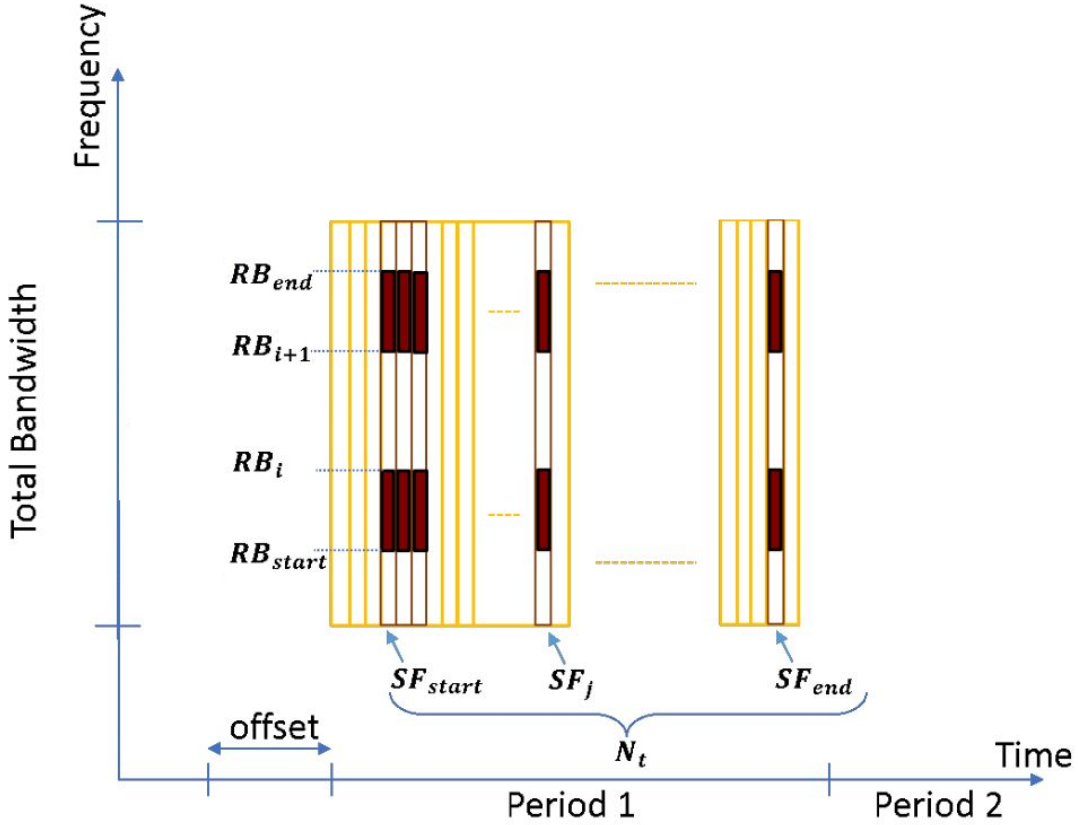
I_{TRP} Gives the index of the TRP

Spell 1 and 2v: $I_{TRP} = 4$

Ex 2:

Spell 2: Time duration 10.11 am to 10:21 am
3 SFs PSCCH and 7 SFs - PSSCH

A **Resource Block** (RB) is the smallest unit of **resources** that can be allocated to a user



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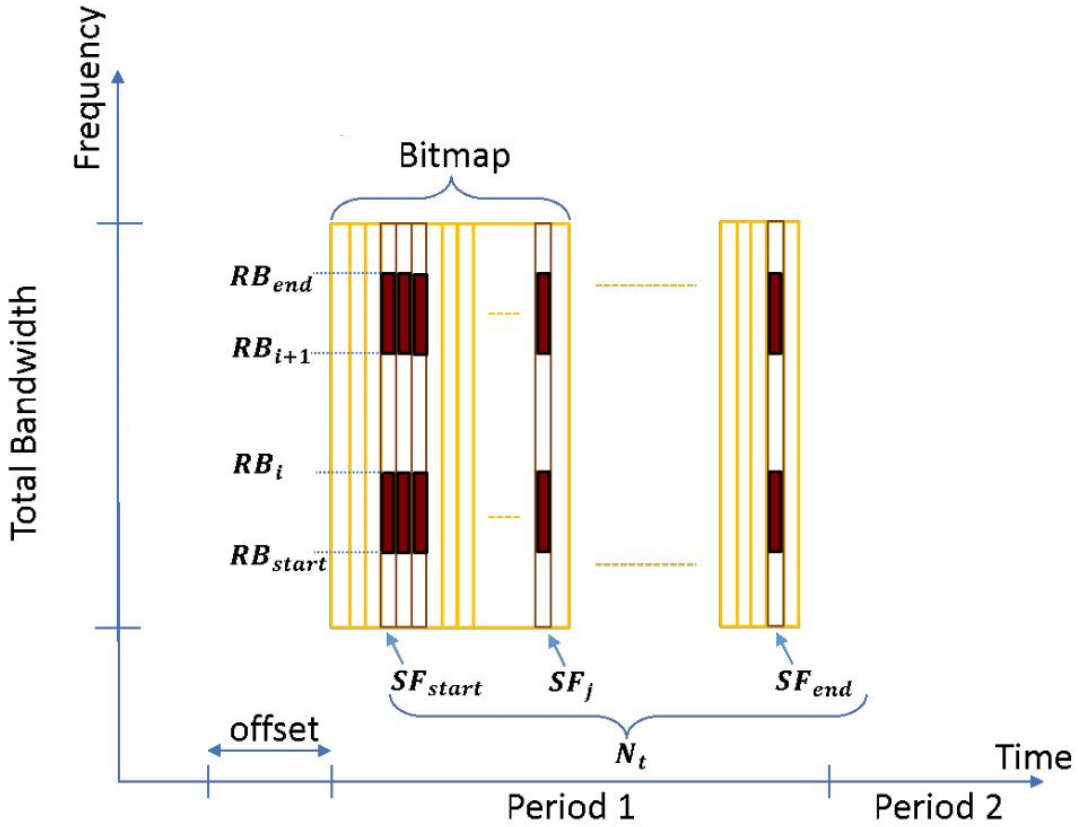

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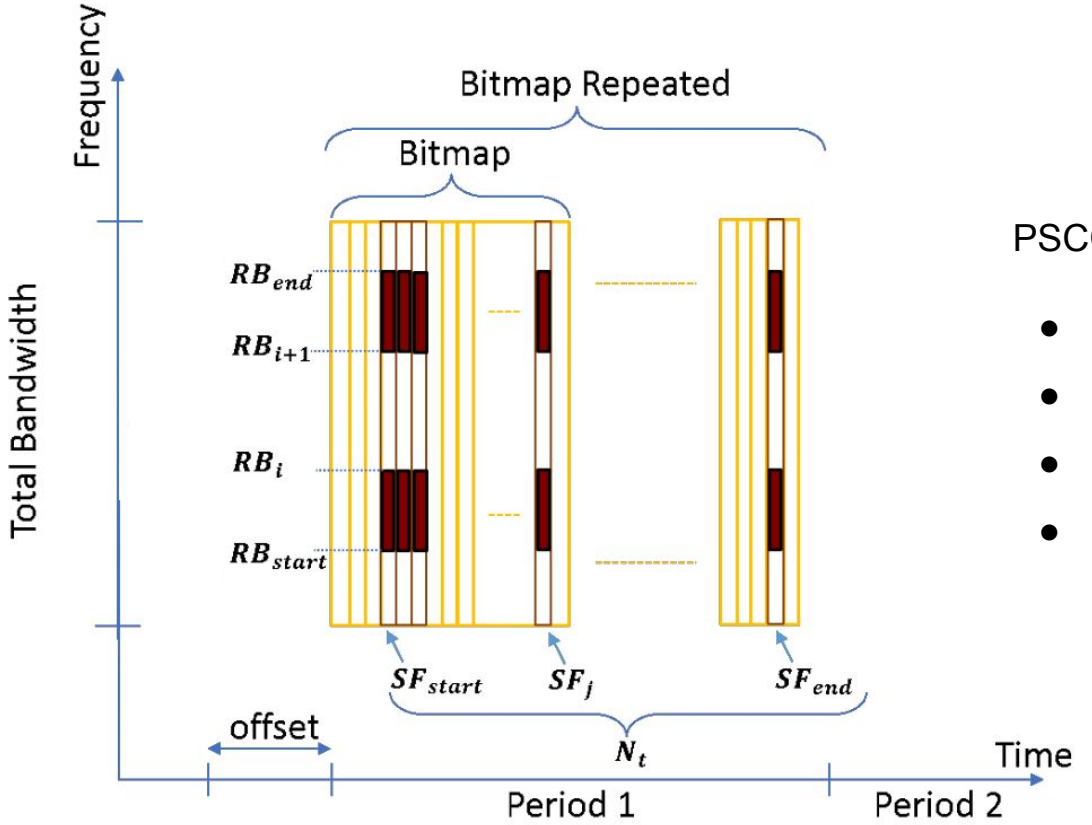


Resource Pool = RBs + SFs

PSCCH - Resource Pool

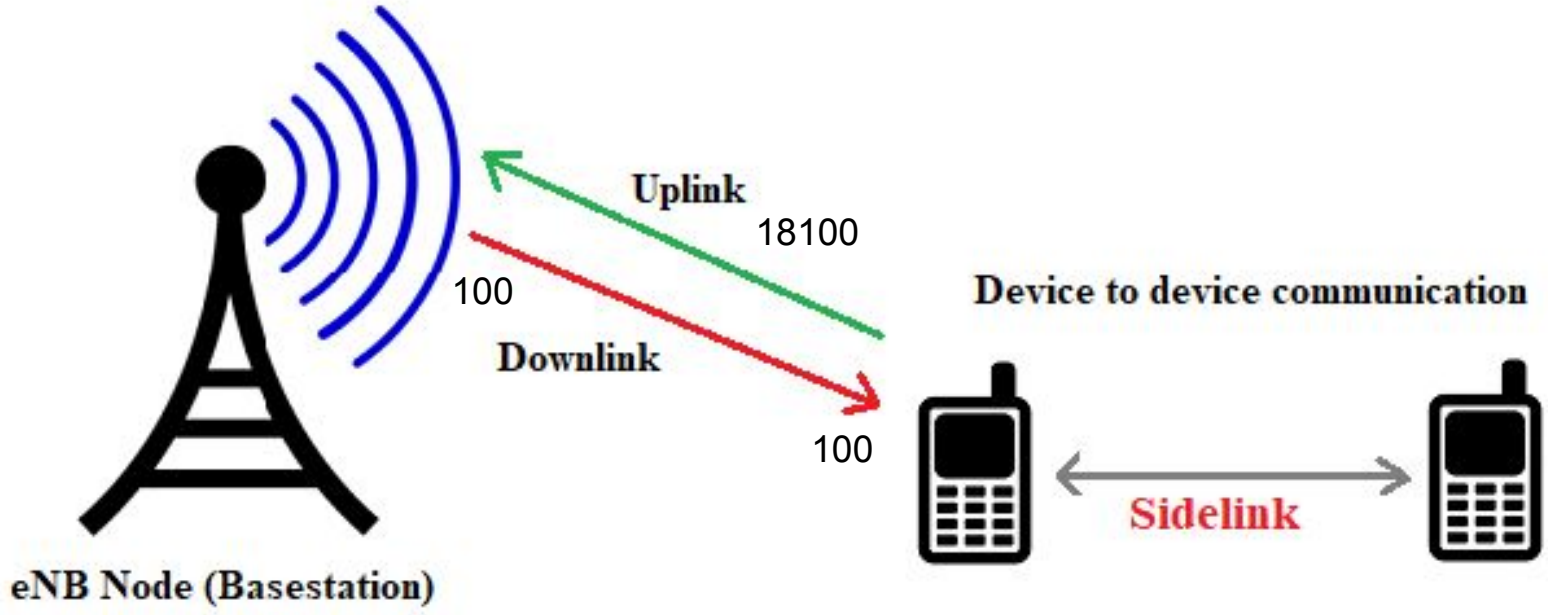
- To whom this message is addressed.
- Where the data is transmitted.
- PSSCH resource assignment
- SCI - SL Control Information

Earfcn

EARFCN - E-UTRA Absolute Radio Frequency Channel Number.

Evolved Universal Terrestrial Radio Access (**E-UTRA**)

The carrier frequency in the uplink and downlink is designated by **EARFCN**, which ranges between 0-65535.



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Bearers

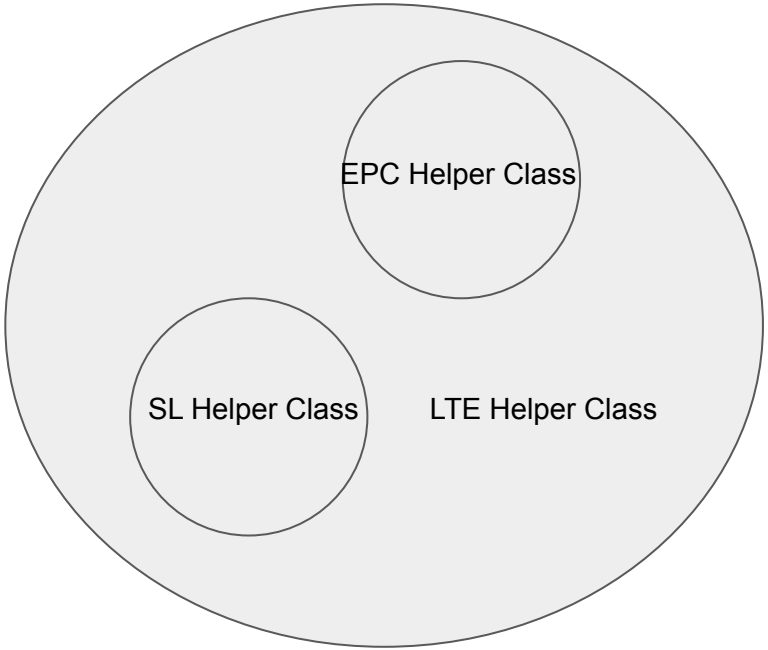
Tunnels between the UE and the internet.

Through the Gateway it will connect the UE to the internet.

Path Loss Model

Activate SL

Scheduler



EPC = Mobility Model, Session Management