

專題進度報告

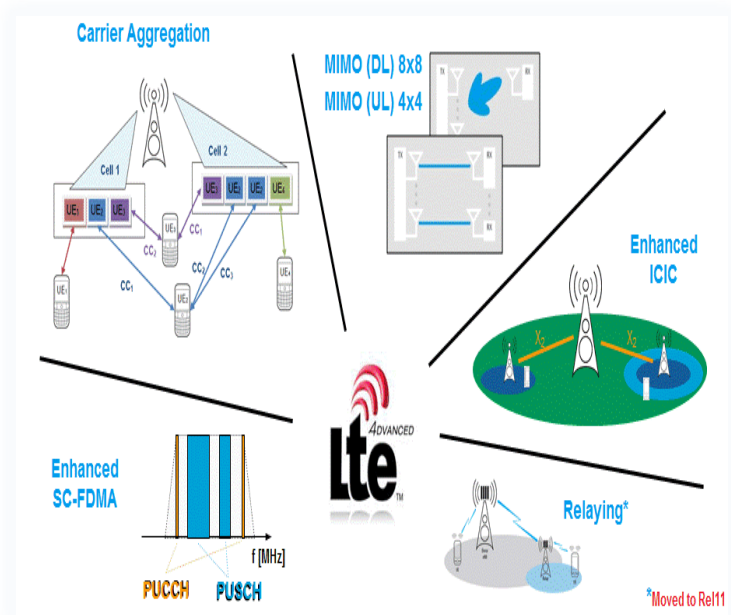
葉宇庭、吉宗騁

2014/03/20

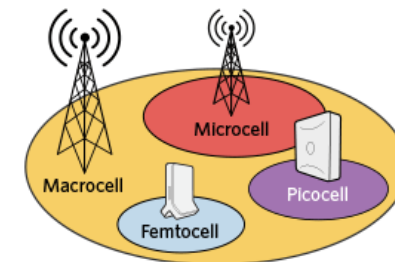
Background: HetNet & Small Cell

Under the concept of HetNet, we need to set a standard platform for all companies.

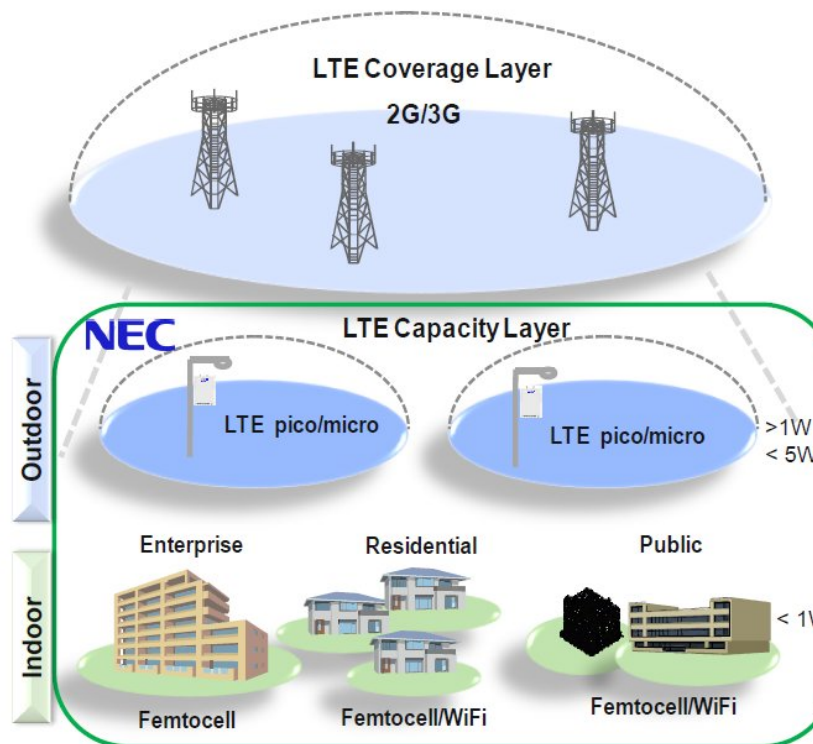
該標準由3GPP LTE（第三代合作夥伴計劃）於2008年第四季度於Release 8版本中首次提出
隨後在Release 10~11版本中3GPP LTE Advanced被提出，以滿足國際電信聯盟對4G的要求



THE HETNET IS EMERGING



LTE Small Cell & Het-Net



The small cell solutions will be key element of a sustainable mobile broadband business

Heterogeneous network

Coverage Layer (lower frequency) + Capacity Layer (higher frequency and small cells)

Small Cell benefits include:

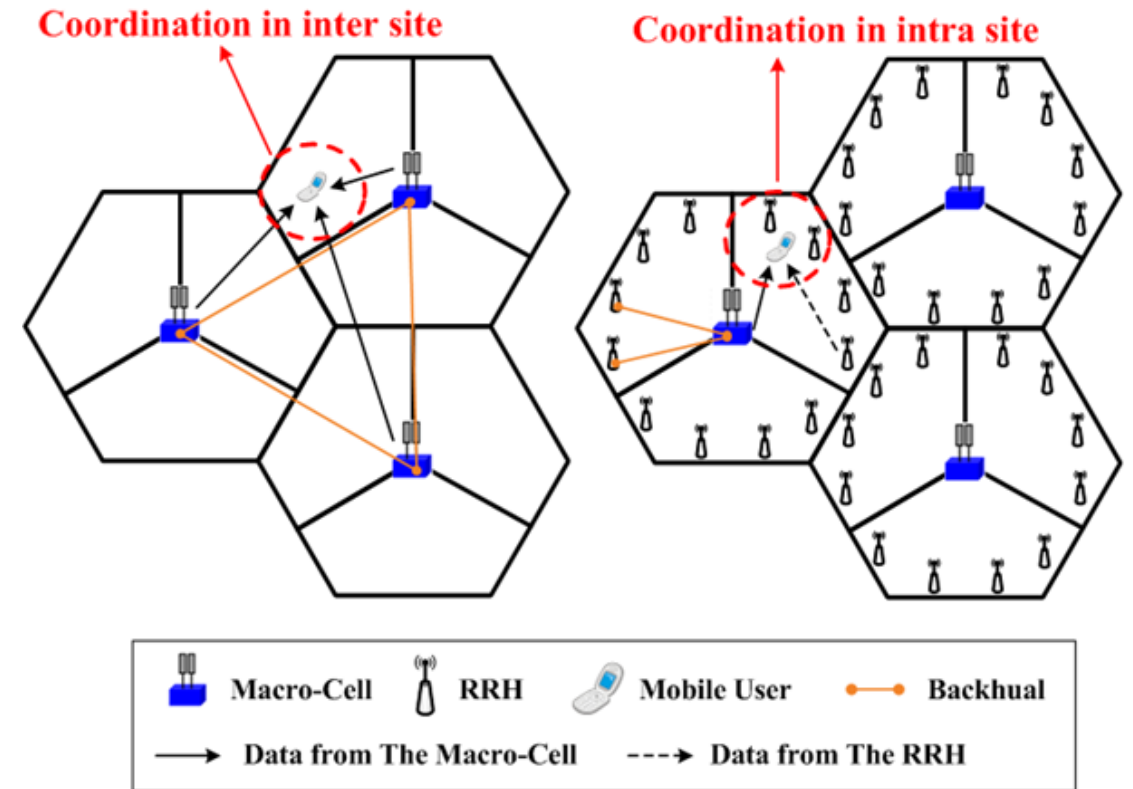
- ✓ Big capacity
- ✓ High performance
- ✓ Easier operation
- ✓ Faster deployment
- ✓ Low TCO
- ✓ New services
- ✓ Additional revenue

Challenges include:

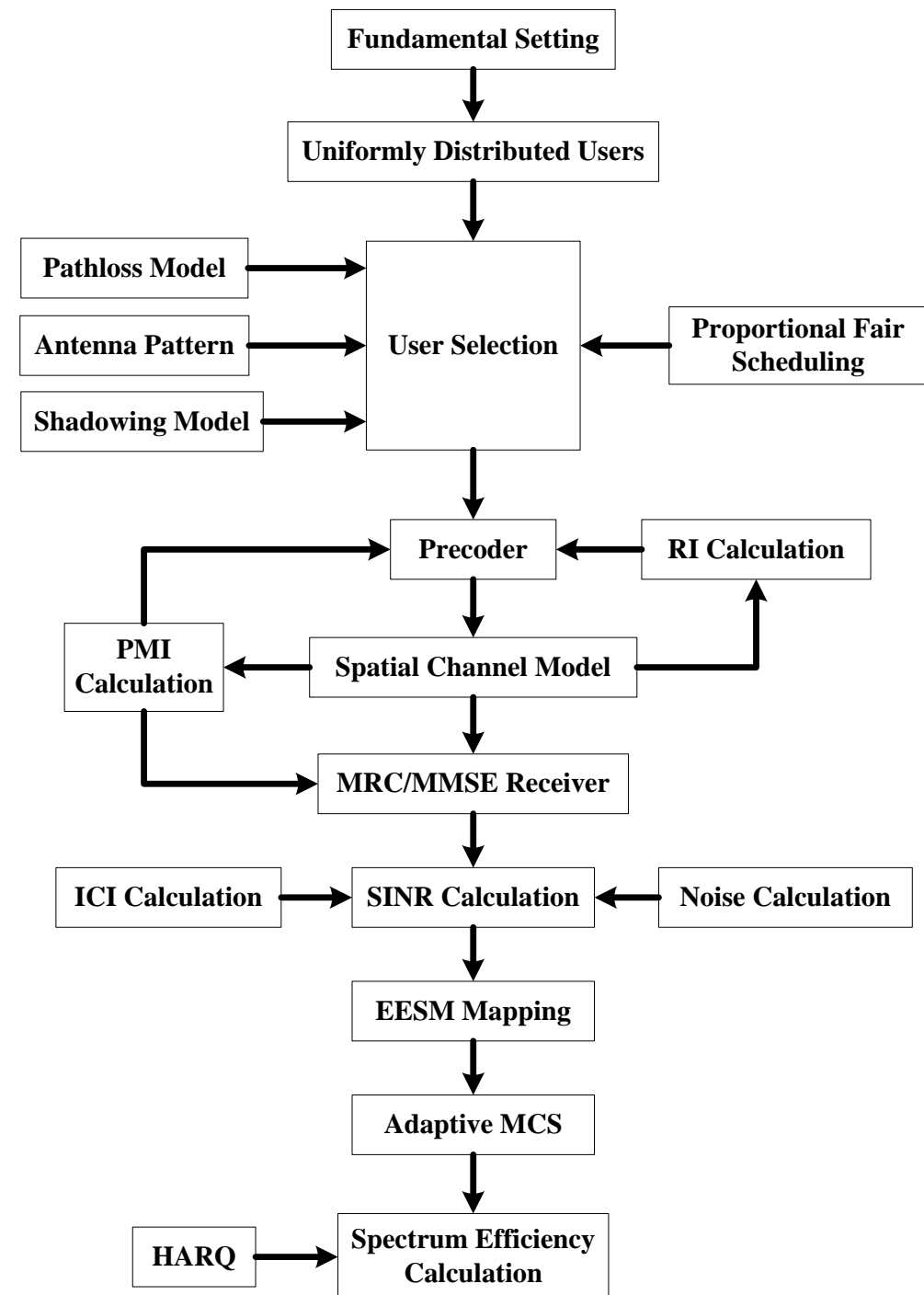
- ✓ Interference
- ✓ Resource management
- ✓ Multi vendor SON & management
- ✓ Backhaul
- ✓ Mind Set Change!

Motivation & Goal

- 依照3GPP standard建立模擬平台並展示效能
- 建立GUI介面讓模擬平台更容易操作
- 分析不同環境下的效能

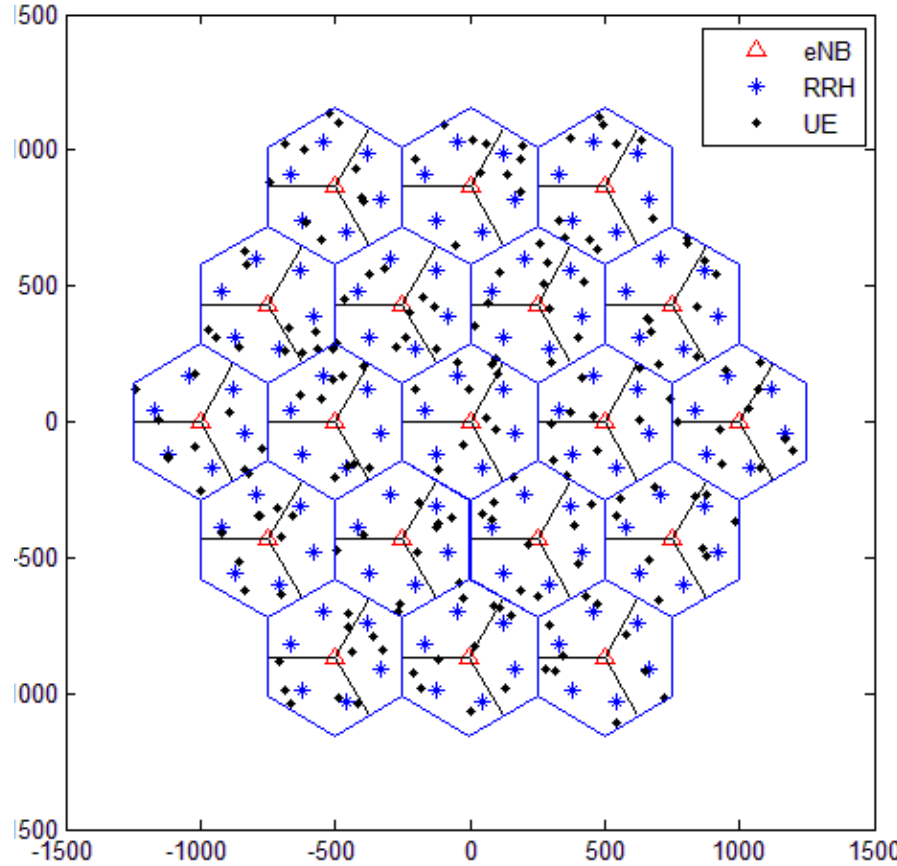
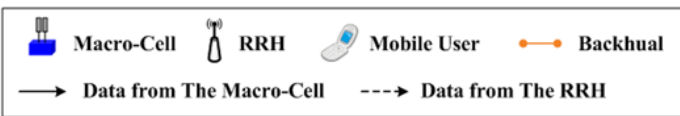
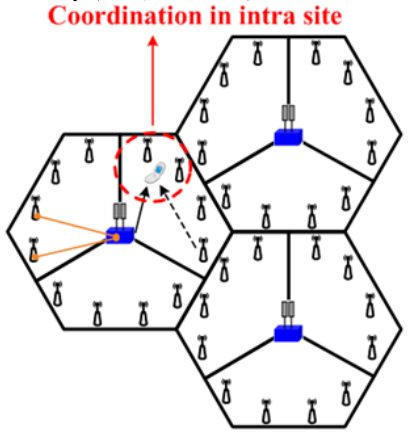


Flow Chart of the LTE-A System Level Simulator



目前進行&預期目標

- 當使用者數量很多時，會需要其他小基地台來協助大基地台
- 希望可將HetNet environment simulation與GUI介面做連結



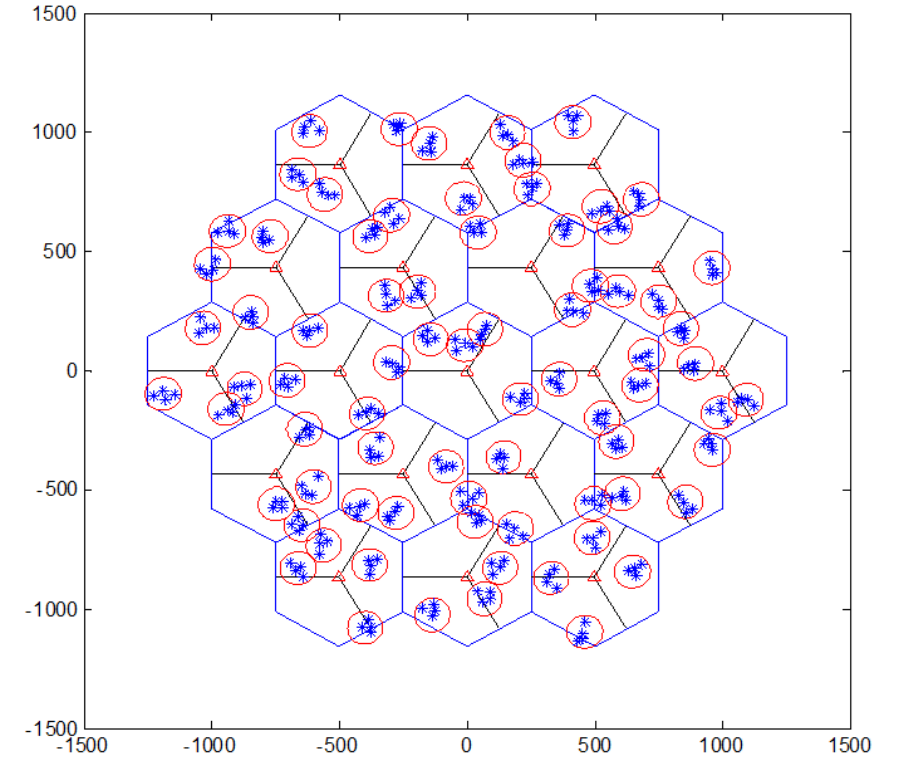
Mobile Communication and Cloud Computing LAB,NCTU

LTE-A System Level Simulator

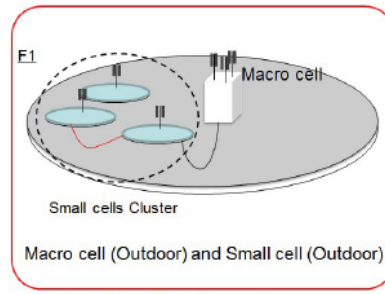
Cell Radius 500/sqrt(3) meters	三種情況 <input checked="" type="radio"/> eNB <input type="radio"/> eNB + RRH <input type="radio"/> 比較eNBRRH
Number of UEs 10 per Cell	Number of RRH 2 Per Sector
Transmitted Power eNB: 46 dBm RRH: 20 dBm	Timer&Counter 執行中 0 %
Sectorization Style Pentagonal	Throughput 0 Rank1 Show(CDF) 0 RankA Show(cdf)
Number of Tx 2	模擬
Number of Rx 2	
Rank Adaptation Yes	

Future Work

- 按照Release12(TR 36.932, TR 36.872), 在新的standard下建立
 - 新的模擬平台
 - GUI介面以及效能分析
 - small cell
 - Multi scenario

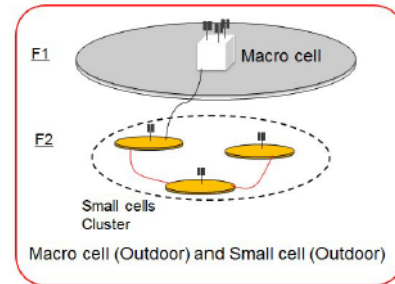


Scenario 1



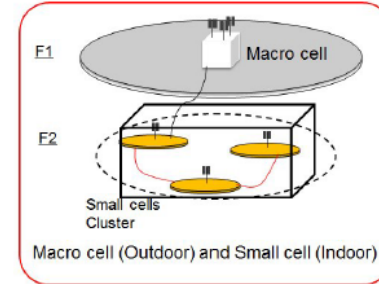
— Backhaul link within cluster
— Backhaul link between small cells and macro cell
Note: Users are distributed both for outdoor and indoor.

Scenario 2a



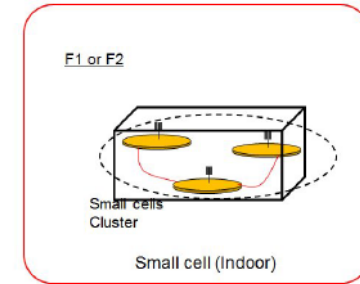
— Backhaul link within cluster
— Backhaul link between small cells and macro cell
Note: Users are distributed both for outdoor and indoor.

Scenario 2b



— Backhaul link within cluster
— Backhaul link between small cells and macro cell
Note: Users are distributed both for outdoor and indoor.

Scenario 3



— Backhaul link within cluster
Note: Users are distributed both for outdoor and indoor.