4G & 5G Mobile Technology

LTE-Advanced Part 2

LTE-Advanced

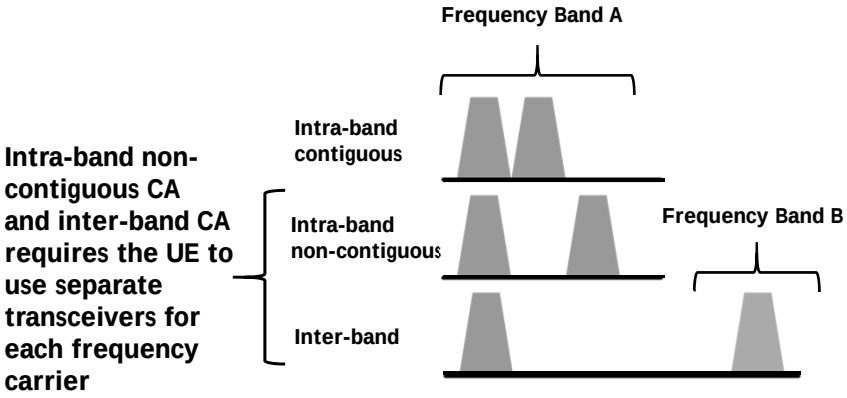
❖ **CA (Carrier Aggregation)**

- CA combines individual component carriers to increase data rate and capacity of the networks
- 3 modes of CA in LTE-A
  - Intra-band contiguous
  - Intra-band non-contiguous
  - Inter-band

LTE-Advanced

❖ CA (Carrier Aggregation)

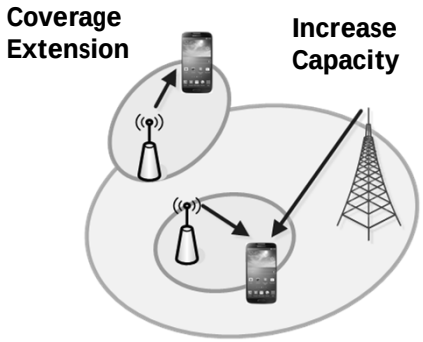
- 3 modes of CA in LTE-A



LTE-Advanced

❖ HetNet (Heterogeneous Network) & Small Cells

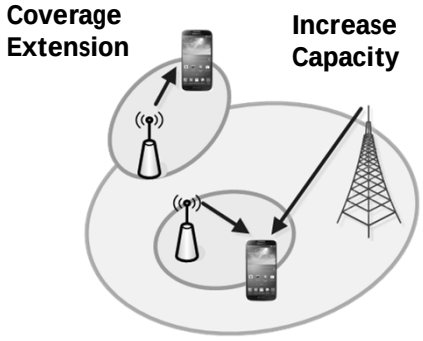
- Solution to increasing traffic demands
  - Expands network capacity
  - Small Cell technology is effective



LTE-Advanced

❖ HetNet (Heterogeneous Network) & Small Cells

- Solution to increasing traffic demands
  - Small Cell technology can use a small cellular eNB, which can be installed inside buildings for CRE (Cell Range Extension) and capacity improvement



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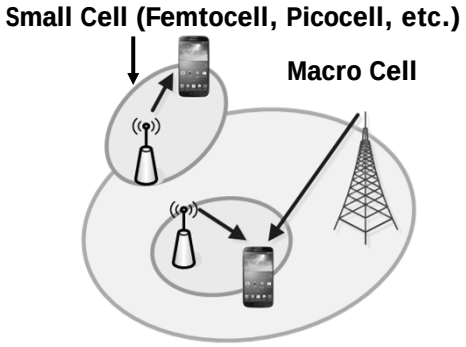
❖ HetNet (Heterogeneous Network) & Small Cells

- Macro Cell provides a few miles of wide area coverage, and Small Cells can be categorized by their coverage, into Microcell, Picocell, Femtocell, etc.



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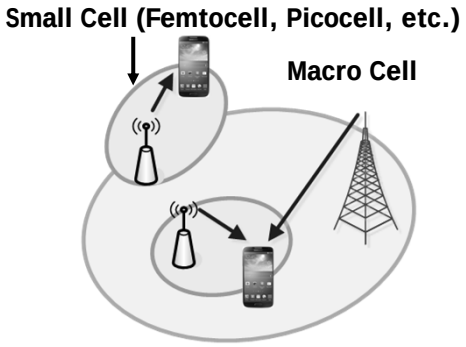
❖ HetNet (Heterogeneous Network) & Small Cells

- Various techniques to manage heterogeneous networks with the different sizes of cells are required (ICIC, CA, CoMP, SON, etc.)



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❖ SON (Self-Organizing Network)

- Manages complex and diverse cellular technology (e.g., Small Cells and HetNet)
  - Automated network set up and maintenance
- SON aims to configure and optimize the network automatically by providing support for:
  - Expanding number of eNB base stations
  - Diverse network parameter optimization
  - New evolving wireless technologies

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❖ SON Functionality

- Self Configuration
  - Newly deployed BSs are automatically installed and configured
- Self Healing
  - Network entities automatically detect system failures and apply solutions for the problems

4G & 5G Mobile Technology

References

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